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A DESCRIPTION OF THE EFFECTS
OF CERTAIN SPATIAL VISUALIZATION TECHNIQUES
ON THE COMPOSING PROCESSES
OF SELECTED TWO YEAR COLLEGE STUDENTS

By

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ABSTRACT

A DESCRIPTION OF THE EFFECTS OF CERTAIN SPATIAL VISUALIZATION TECHNIQUES ON THE COMPOSING PROCESSES OF SELECTED TWO YEAR COLLEGE STUDENTS

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The purpose of this study was to examine the effects of certain non-linear organizing strategies such as clusters and hierarchical maps on the composing processes of students enrolled in a two year college.

This investigation was specifically interested in the decisions students writers made with the information provided by these strategies; the effect these decisions had on the degree of control student writers felt they had over the development of the essays they wrote; and the relationship between the permanent nature of the visualizations and the demands made on short term memory by the composing process.

The study was conducted using the Participant/Observer approach as discussed in WORKING TOGETHER: A GUIDE FOR TEACHER RESEARCHERS by Mohr and Maclean and RECLAIMING THE CLASSROOM: TEACHER RESEARCH AS AN AGENCY FOR CHANGE by Goswami and Stillman. Each student kept a log of classroom activities as well as writing topical journals throughout

the course. The students were interviewed using guidelines discussed by Graves and verbal protocols were taken at several points throughout the term. In addition, the instructor also kept a research log.

The data collected revealed that maps do help writers act on their thoughts in a positive way. Visualizations play a role in increasing students' feeling of control over the composing process and they help ease the burden placed on short term memory, particularly throughout the early invention stages of composition.

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FRED BARTON

1989

To Mr. and Mrs. Joseph Chess,

Jim, Alice and Kathy

Who became my family when I needed one,
and set me on the road that led to this place.

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CHAPTER ONE: READINGS

INTRODUCTION

The purpose of this study is to describe the interaction between student writers and certain organizational schemata I have classified under the rubric spatial visualizations. I call these strategies spatial because they are not limited to the traditional linear development seen with other organizational devices such as outlines. Instead, they give writers more creative control over the use they make of the space with which they work: the empty page. This enables writers to shape their ideas into personally meaningful structures.

I refer to these devices as visualizations because they may give the writer the ability to work with developing abstract relationships between ideas, as well as with order of presentation, or degree of detail. They are intended to be snapshots of thoughts, particularly in the initial stages of the composing process.

Traditional outline techniques resemble maps of the sort I am describing here because they provide the writer with a prioritized list of details contained in the essay, but they cannot be created until those details have been somehow collected and recorded. Spatial visualization techniques, on the other hand, operate at the level of idea; attempt to provide a picture of the relationships that make up the essay as they are discovered; and, give the writer a

means of recording and focusing the ideas generated during the composing process. Included in this category are techniques variously called, clusters, maps, hierarchies, cognitive maps, storyboards, ideagraphs, patterned notetaking, Construct Procedure, graphic overview, networking, webs, flowcharting and semantic mapping among others. Spatial visualization then, is a personalized record of thought and a picture of the relationship between ideas, rather than for instance, a vertical list of details. The techniques may provide the writer with a tangible image of the abstract, often fleeting nature of compositional thought.

These activities are metaphors. Just as a rose can be a visualization for love in a poem, spatial visualizations can be metaphors for thought in an essay. In addition, these techniques can also stand for the relationship between the individual ideas and the course those ideas take on the way to completion of the work.

For these reasons, the introduction to my study of spatial visualization is most comfortably contained as an aspect of the study of metaphor and thus, that is where this discussion starts. The initial authors whose work I discuss deal almost exclusively with the relationship between metaphor and the mind. While their individual purposes may vary, the reason I have included them here is to show the close connection between the device of metaphor and the nature of thought. Later, the nature of thought will

provide the underpinning upon which I will construct a description of the function of spatial visualizations in the composition class. As my discussion progresses, the role of thinking will rise again, contained in the question of where meaning is made for a receiver, and how meaning is produced in a sender. Again, the larger issues of meaning generation and transmission will provide the frame for a specific explanation of spatial visualization techniques.

I will also discuss, through the readings, the role of metaphor in the issue of control. That is, how do language users make sense of the stimuli around them; how do they choose what to remember, and what to forget; how do they organize their memories for later recall and transmission. In the early part of the discussion, the authors may have wider purposes than a discussion of spatial visualization as it relates to composition, but the point of their inclusion is to show the strong, and sometimes very direct relationship between the construction of metaphor and activities the mind undertakes to make meaning that, while not always specific to composition, are often just as important when writing papers as when remembering loved ones' birthdays.

Closely related to the issues of where meaning resides and how it is organized in the mind is the issue of confidence. In other words, how comfortable do meaning makers feel about their ability to produce meaningful discourse. Several authors discuss the importance of the

concept of confidence from different angles. My specific interest is more closely related to what others have referred to as an aspect of "authorship," but I have included these authors to give a wider understanding of the strength of the connection between students' role as meaning makers, which they have to recognize in themselves, and the awareness they have of their own role as a user of metaphors, or later, more specifically, spatial visualization techniques.

Generally I have organized the chapter from larger issues centered around the concept of metaphor as a whole, to the more specific issues that concern the role of spatial visualization in the composition classroom. It is my hope that the wide open nature of the first part of the chapter will provide the reader with a context in which to fit the later, more specific discussions. As several of the authors to follow will point out, the effectiveness of metaphor is often directly related to the ability of the hearer, or reader to place it in a context familiar to him or her.

THE IMPORTANCE OF METAPHOR

The idea of metaphor as a language element that stands for something other is the oldest view of metaphor. In his *POETICS*, Aristotle wrote, "Metaphor consists of giving the thing a name that belongs to something else..." (pg. 1457) Later, in *RHETORIC*, he discussed the usefulness and dangers of metaphor when he wrote, "Use metaphors and epithets by

way of illustration, taking care however to avoid what is too poetical." (III, iv, 6)

Closer to our own time, in the 1860's, Max Muller, in a series of lectures later gathered into a book titled LECTURES ON THE SCIENCE OF LANGUAGE stated, "Metaphor generally means the transferring of a name from the object to which it properly belongs to other objects which strike the mind as in some way or other participating in the peculiarities of the first object." (pg. 369) While his definition of metaphor was similar to Aristotle's, Muller saw a greater function for it in language development. Later in the same lecture he states, "No advance was possible in the intellectual life of man without metaphor." (pg. 370)

I. A. Richards writing in the early part of this century, blurred the line between what a metaphor is and what it does. In THE PHILOSOPHY OF RHETORIC he wrote, "When we use a metaphor we have two thoughts of different things active together and supported by a single word or phrase whose meaning is a result of interaction." (pg. 93) In his view the word stood for part of a context or combination of events, thus form and function were intermixed. Northrup Frye, a contemporary of Richards writing during the same time, was not so sure. In ANATOMY OF CRITICISM he writes that a metaphor is "...the identification of two things, of which each retains its own form." (pg. 334) Unlike Richards,

Frye believes that the theories of Aristotle provide the best description of metaphor.

In 1962 Max Black wrote *MODELS AND METAPHORS* in which he built on the work done by Richards and inspired some of the later investigations discussed in this chapter. Like Richards, Black saw form and function of metaphor as very closely related. Like Richards, he concerned himself with contexts instead of isolated occurrences, and like Richards he saw metaphor as playing a larger role in the relationship between thought and language than was previously supposed.

The next attempt was to develop a theory that contained previous thought rather than excluded it. That task was undertaken by Paul Ricoeur¹ who, quoted in *THE PHILOSOPHY OF PAUL RICOEUR*, edited by Henry Regean and David Stewart wrote, "...metaphor as a pair of contrasting traits: the meaning is carried by a specific structure, that of the proposition, which involves an inner opposition between a pole of singular identification (this man, the table, Mr. Jones, London), and a pole of general predication (mankind as a class, lightness as a property, equality with such and such as a relation, running as an action). Metaphor, as we shall see, relies on this 'attribution' of characters

1. I chose these six men not because they have anything more or less valuable to say about metaphor than others who have done work in this field, but as six who represent the range and breadth of thinking on the subject. Their function here is that of greeters, welcoming us to the subject. Later I will write in more detail about some of these men whose thoughts can help with the topic at hand: spatial visualization.

to the 'principal' subject of a sentence. (pg. 136) In other words, word and context play a role in metaphor. Ricouer sees metaphor as a cooperative, inclusive, synthesis of language and thought rather than an exclusive one.

My immediate concern is with the aspect of that synthesis represented by spatial visualization, and its function in a composition classroom. Like Richards and Black with metaphor, I intend to blur the line between what spatial visualization is and what it does. Along with these two men I see metaphor, and more specifically spatial visualization, as involving the totality of both users and receivers. In other words, human beings communicate with metaphor. Therefore, as a foundation for this investigation, and to establish a context for my ideas, I begin with a discussion of the writings of language psychologists such as Black² and Ortony.³ These theorists were interested in the role metaphor plays in the language process, as well as the effect it has on its users. Their writings helped lay the groundwork for later, more formal investigations by authors such as Verbrugge,⁴ among others,

2. Until his death earlier last year, Max Black was Professor of Philosophy at Cornell University. His writings on language are widely quoted in the literature of several different disciplines.

3. Andrew Ortony is Assistant Professor of Educational Psychology at the University of Illinois, Urbana. He has published both empirical and speculative work on the importance of metaphor.

4. Robert Verbrugge is Professor of Psychology at the University of Connecticut and Haskins Laboratories. His study, discussed in this chapter, was cited numerous times as a seminal work in the area of metaphoric comprehension.

into specific uses and results of metaphoric language. At times their findings surprised even them. They found metaphor a much more central, perhaps indispensable, part of language, and people, than they had imagined. Metaphor was more than a tool pulled out of the linguistic tool box when the occasion demanded, it may be the tool box itself, providing the shape and limits within which the other tools are contained.

In the second part of the chapter, I return to theorists and investigators closer to the traditional field of English and find that their thoughts and investigations are leading them down a road parallel to that of the psychologists. The limited idea of metaphor as a literary device utilized by a selected clientele is soon overshadowed by the growing realization that metaphor may make language possible. Following the thought of people like Richards, Berthoff and the like, investigators began to look closely at metaphor in an academic setting. Since my purpose is to investigate metaphorical activities in the composition classroom, I focus on people like Flower, Daiute, Dilworth and others whose investigations share some of the same goals as my own. Like the psychologists before them these researchers find that metaphor invites itself into a composition classroom, welcome or not.

Like many in years past who warn about the destructive nature of metaphor, these investigators found that, when not welcomed, or acknowledged, metaphor can be as

counterproductive as authors back to Aristotle warned. It can confuse the students, cast a pall over the relationship between the teacher and the pupils, and truncate any information the students may snatch from the class.

In the last part of the chapter I focus on studies that discuss spatial visualization as a way of welcoming metaphor into the writing class. The findings in this section indicate that these techniques allow students to discover meaningful relationships in their writings, provide them with a way to record those relationships, improve the climate of learning created by their instructor and increase the students' confidence in themselves.

METAPHOR AND PSYCHOLOGY

In **MODELS AND METAPHORS** Max Black has written that "Metaphors plug the gaps in literal vocabulary." (pg. 44) (See Iser's **THE ACT OF READING** for a similar discussion of a theory of reading.) By this he meant that metaphors allow language users to go beyond mere empirical descriptions of the environment to levels of abstraction that allow for the discussion of ideas and the linking of unobservable characteristics. To illustrate this point he uses Richards' metaphoric example, "the poor are the negroes of Europe." The point of Richards' metaphorical description carries a meaning that transcends the parts that comprise it. The comparison of two seemingly different elements creates a new

level of meaning which goes beyond the idea that the poor are not well off. The statement carries implications concerning their relationship to the rest of European society. It even implies an attitude towards their future and what it may hold.

Thus the metaphor becomes an economical and forceful comparison in which a great deal of, not only information, but opinions and attitudes can be transmitted. In addition, metaphor allows language to slip the bonds of the here and now. One statement, referring to the situation of a present day group in Europe, also encompasses aspects of European social history as its ground, and the future according to the views of the speaker, all at the same time.

Black realizes however, that in order for the metaphor to work certain conditions have to be met. He sees that metaphor involves the speaker and the listener as active participants in the language transaction. "Metaphor must be classified as a term belonging to semantics and not to syntax..." he says. (pg.28) In other words, metaphor operates beyond the frame of grammar, and larger cultural backgrounds are necessary to interpret it. Black refers to these backgrounds as "associated commonplaces" which he describes as meanings, not necessarily true, shared by members of a particular culture. As a semantic rather than a syntactic term, the rules for the usage of metaphor are, to use Black's term, "loose." Admittedly borrowing from

Richards, Black establishes three categories of metaphor, only one of which he finds valuable.

Black rejects the classical Aristotelian substitution and comparison views of metaphor as being too narrow. He thinks they do not go far enough in describing the capabilities of metaphor. The substitution view limits metaphor to a mere decoration, or deviation from the plain literal style, in his view. Comparison, which in his opinion is a special case of the substitution view, reduces metaphor to a closed simile. As he says, "Metaphorical statement is not a substitute for a formal comparison or any other kind of literal statement, but has its own distinctive capacities and achievements..." (pg. 37)⁵

Another metaphorical theorist, Paul Ricoeur, was not so quick to dismiss Aristotle. Quoted in THE PHILOSOPHY OF PAUL RICOEUR, edited by Henry Regean and David Stewart he writes, "Even if the remainder of the analysis tends to show there are no metaphors, in the sense of metaphorical words, without certain contexts, even therefore, if we shall have to speak of metaphorical statements requiring at least the length of a sentence, or a phrase, nevertheless, the 'metaphorical twist'...is something which happens to words; the shift of meaning which requires the whole contribution

5. Black's contribution to this field is substantial. In addition to the text cited here he is the author of several other books and numerous articles. He devoted a sizable part of his professional life to the investigation of metaphor. After I.A. Richards he is the source most often quoted by authors I studied.

of the context affects the word; it is the word that has a 'metaphorical use,' or of a non-literal meaning, or a novel 'emergent meaning' in specific contexts. In that sense the definition of metaphor by Aristotle--as a transposition of an alien name (or word)- is not cancelled by a theory which lays the stress on the contextual action which creates the shift of meaning in the word. The word remains the 'focus' even if this focus requires the 'frame' of the sentence, to use the vocabulary of Max Black." (pg. 135)

Without stating it exactly, Ricouer has raised an important point concerning theories of metaphor. From Aristotle to contemporary thinkers, theories of metaphor seem to be placed along a continuum with the new growing out of the old. Most important, therefore is the realization that new theory need not negate old, but can compliment and expand it. That is the approach I wish to take in this discussion.

Interaction is the name of the view Black favors most. Admittedly, he again draws from Richards. His associated commonplaces and Richards' ground are similar concepts. Both men rely on a cultural component for understanding metaphor. This separates them from people like Northrup Frye and Max Muller who took a more textual view of metaphor. Quoted in Shibbes' AN ANALYSIS OF METAPHOR IN LIGHT OF W.M. URBAN'S THEORIES, Black explains that in the interaction view "the new context, (or frame) imposes

extension of meaning upon the focal world; the old and new meaning must be attended together; two thoughts are connected and active together, inter-illuminate and cooperate." (pg. 153) As his example he uses the metaphor "Man is a wolf." In this usage the concept man is "filtered" through the concept wolf. Wolf has a set of associated commonplaces in our society, both true and untrue which are made, by the listener, to fit into the set of commonplaces for man. The process reveals new aspects of man and provides new insights. In addition to literal or informational elements, this interaction also produces new emotional and attitudinal positions on the part of the listener.

Interaction differs from the substitution and comparison views because it is much more idiosyncratic, depending on the listener rather than prestructured general categories from which similarities are picked. Also, it works both ways in that, as man is seen more wolf-like, wolves can also be seen as more man-like. Black and Richards differed on the degree of emotional shifting that went along with this interaction view, but both men saw metaphor as a means of economically transmitting great amounts of linguistic and emotional information. Both men also saw metaphor as an essentially slippery concept. As Black said, in *MODELS AND METAPHORS*, "There are, in general, no standard rules for the degree of weight or emphasis to be attached to a particular use of an expression." (pg. 29)

Verbrugge is another of the psychologists who have begun to investigate metaphor. He has collected the various theories put forth on the workings of metaphor into four categories. The first one is called substitution, borrowing directly from Aristotle, and is described as the case of one idea being put in the place of another to allow a sentence to make sense, beyond the literal. Generally a symbolic idea is signaled by a literally meaningless statement. This is the simplest and most straightforward of the categories and has been around the longest. Verbrugge goes beyond Aristotle in accepting that metaphor can be made by more than nouns and verbs, but the underlying notion of replacing one idea with another remains essentially the same. As he says, in Honeck and Hoffman's COGNITION AND FIGURATIVE LANGUAGE, "To comprehend this underlying intent, a listener must invert the substitution, replacing the intruder by a literal term (or concept) compatible with the rest of the sentence. In comprehending 'Highways are snakes,' one might (with luck) obtain something like 'Highways are long and thin,' or 'Highways are curvey'" (pg. 198)

Verbrugge's second category is comparison, which, he explains, is a special kind of substitution. In substitution the metaphorical term is thought to substitute for the literal term because the literal term renders the sentence meaningless unless it is seen as a flag signifying the sentence is not to be interpreted in the usual manner.

With the example "The highways are snakes" the listener substitutes long and thin or curvey for the literal "snakes" to produce a meaning. In the comparison view, however, the entire sentence is treated as a unit and, instead of replacing a term the listener must reconstruct the entire idea. Thus "The Highways are snakes" might become "Highways are similar to snakes in that they both have property X." Black, also quoted in Honeck and Hoffman, sums up classification this way: "The comparison view is a special case of the substitution view focusing on the equivocality of sentence form (rather than word form) in the specification of meaning, and emphasizing that both domains, not just the topic, must be included in sentence meaning." (pg. 63). In other words, the listener does not simply remove one term and replace it with another. The meanings of both the topic and vehicle must be considered in the process of making metaphorical meaning.

The next two categories, Interaction and Transformation represent quantum leaps from the first two. Substitution and Comparison imply meaning is accomplished by application of the proper process. In the interactive category though, are the first inklings that meaning is created in a dynamic process between metaphor maker and listener. Verbrugge's use of Black's work in this area, makes specific reference to his idea of filtering. Verbrugge explains this as the process of identifying the literal aspect of the metaphor in terms of the abstract. In other words, Highways are now

viewed through a snake filter. The aspects that highways share with snakes are brought into prominence, and other aspects are suppressed. In this way the listener interacts with the sentence and establishes a meaning based on his or her particular understanding of snake characteristics--what Black calls the associated commonplaces. Verbrugge is not able to agree completely with Black in this area. He still sees this process as too much of a categorization, relegating the listener to picking meanings off of a shelf and combining them, rather than engaging in a dynamic process. While he agrees with Black that the two elements of the metaphor do not "fuse" and disappear into each other to create an entirely new entity, he is concerned that Black's idea still separates them too much. As he says, "Total separation and total fusion are not the only theoretical options available; indeed, they are only the endpoints on a continuum of possibilities." (pg. 201)

These concerns lead him to his last category, Transformation which he defines as "[perceiving] familiar structures or transformations in an unusual context." (pg. 202) Here the listener transforms highways into snakes. This is a partial transformation because highways do not become snakes, yet the process produces a "virtual experience" which leads to a permanent change in the way both objects are perceived, rather than being a one time utilization of prestructured classifications that are then

stored until needed again. Transformation is a dynamic semi-idiosyncratic process.

These categories appear to be different masks on the same face. If metaphor is dependent on context, as some would argue, then the device is bound to have different functions at different times and with different participants. Indeed, later some authors, most notably Petrie, will argue that what is comparative for some, may be interactive for others. These classifications of Verbrugge's are perhaps better described as he said, by being locations along a continuum, rather than separate entities.

Seventeen years after the publication of Black's *MODELS AND METAPHORS*, Ortony wrote in *METAPHOR AND THOUGHT* that "Any serious study of metaphor is almost obliged to start with the works of Aristotle." Later in the same passage he says, "A more contemporary influence on the theoretical study of metaphor was that of I. A. Richards." (pg. 8) Most scholars I read would agree with his statement, but Ortony himself has done considerable work in the area of metaphor which deserves attention.

Ortony's ruminations on metaphor develop from his reading of people like Wittgenstein, whose view was that experience does not come in discrete packets, but flows from one state to another. As an example, in an article titled "Why Metaphors Are Necessary And Not Just Nice," Ortony describes the phenomenon of being awakened by an alarm

clock. "Thus when suddenly awakened by a hostile alarm clock or telephone bell we frequently feel that the noise was part of a dream--as though our unconscious had constructed a bridge to take us more smoothly from one state to another." (pg 46) According to Ortony, our language reflects this flow of experience. "Words do not have distinct, sharply delineated meanings," he says. (pg.46) Language, like the experience it describes, must be loose and sufficiently flexible.

Metaphor, in Ortony's view, provides this flexibility. He says, "The continuity of experience therefore, is not just a temporal continuity; it is, as it were, a continuity in referential space and it is the total continuity of experience which at once underlies and necessitates the use of metaphor in linguistic communication." (pg. 46) Ortony sees language as a discrete symbol system trying to encompass the information in a continuum. Without metaphor, language would be "deficient" in capturing all of the elements of things or events in experience. Metaphor gives a dimension to language that enables it to fit the flow of events and make that flow meaningful to speakers and listeners. Metaphor is one of the ways we structure new experience to give it meaning.

Like Verbrugge, Ortony classifies the various theories of how metaphors work into categories which he calls the theses of metaphor. The first thesis is compactness. He attributes this thesis to a "reductionist" view of language

which states that to produce language one must break down experience, and to understand it one must rebuild. Of course, the two processes are not 100% effective so gaps are left in the transmission and reception which must be filled in order for meaning to occur. Ortony calls this "particularization" and offers as an example, a newspaper report of a man swimming the English Channel in mid winter. He says, "I build a representation which evokes what I know about men and their capacity to swim, about what I know or believe (or even imagine) to be some of the characteristics of the English Channel and so on. What I evoke is largely experiential, perceptual and cognitive, and to this extent generally similar, but probably almost never identical, to what others evoke. I infer that the man was probably covered with oil, that he was strong and muscular, that the sea was likely cold and rough, that the sky was perhaps gray and gloomy. I might also invoke my knowledge of likely public reaction, a reaction of admiration, incredulity, indifference, or even alleged insanity. All these things and a host of others 'come to mind,' or many do. Perhaps the best way to construct such a representation furnished with details not specified in the literal message is to form a 'mental image.'" (pg.47) Ortony suggests that the metaphorical process guides particularization and allows for large "chunks" of information to be transmitted indirectly. He calls it the "language users digital-to-analog converter"

taking him or her closer to the experience of the event and farther from the discrete symbol system of language.

The similarities between Ortony's position and Verbrugge's transformational category, as well as the reliance on what Black called associated commonplaces, are strong. Ortony's reader transforms the swimmer and the swimming according to what he or she knows about these concepts. A person reading the account in Beijing would construct a different experience than a person in Wales. To paraphrase Richards, each has a different universe of discourse in which to plot this event and locate its meaning.

Ortony calls his second thesis inexpressibility which is established with two types of arguments. "The first is that the continuous nature of experience precludes the possibility of having distinctions in word meanings capable of capturing every conceivable detail that one might wish to convey--and this in spite of the flexibility of individual word meanings. The second is that it would appear more reasonable to hold the inexpressibility view than its alternative that there is nothing that cannot be conveyed literally in a language." (pg. 49) The first argument for the inexpressibility thesis contains resonances of the compactness thesis and, in fact, Ortony describes inexpressibility as a "combination" that leads to a transference of "chunks" that would include many attributes of experience not capable of being represented by a discrete

symbol system. As a further argument, he says that information is not transmitted in bits at all, but chunks. Some experience is not able to be broken into discrete units, hence, the need for metaphor which allows the transmittal of large meaning units of this type. "People simply do not use metaphors to transfer one characteristic, even if it is a distinctive one, when there is a ready literal way of making the point." (pg.50) (See Frank Smith's *READING WITHOUT NONSENSE* for a discussion of the role of "chunking" in making understanding from text.) As comparison was a special variety of substitution in other classification systems, it seems the inexpressibility thesis is a special variety, or perhaps a continuation, of the compactness thesis.

The vividness thesis is Ortony's third, and last, classification. Metaphors have a stronger effect on listeners because they come closer to the actual experience than literal language. This foreshadows his explanation of the academic usefulness of metaphors. He says, "The educational power of metaphor is thus twofold. The vivid imagery arising from metaphorical comprehension encourages memorability and generates of necessity a better, more insightful, personal understanding. But also it is a very effective device for moving from the well known to the less well known, from vehicle to topic." (pg.51) Here he touches on the major themes of metaphor throughout the ages. As early as the time of Plato and Aristotle arguments for

caution with metaphor were made because it was viewed as such a powerful device, having the ability to excite and, according to some, confuse. In his second argument Ortony anticipates the studies done by Verbrugge, among others, which document the usefulness of metaphor in an educational setting.

Anticipating people like Petrie and Sticht, Ortony explains ways teachers can help students learn through the use of metaphor. He favors assisting the students in constructing the "grounds" of the metaphor by ascertaining how much they know about a subject in advance, then "...incorporating literally applicable qualifiers and by building up larger metaphors out of smaller ones." (pg.51) (See Anderson's essay "Role of the Reader's Schema in Comprehension, Learning and Memory" in Anderson, Osborn and Tierney's *LEARNING TO READ IN AMERICAN SCHOOLS* for a similar discussion in terms of the teaching of reading) He provides a sample lesson using Longfellow's "The Spirit of Poetry" as his text and concludes by saying, "A metaphor used successfully can give insight and comprehension; used unsuccessfully it can generate confusion and despair." (pg.52)

The process by which this comprehension, or confusion, is generated in the listener is separated into three areas by Ortony. The first is anomaly, in which the listener realizes the statement does not make literal sense. This creates the second phase, a tension which can only be

resolved by viewing the statement in a metaphorical light. The realization of anomaly leads to a search for like characteristics between the topic and vehicle. To use Verbrugge's earlier example, the listener must first know that highways are not snakes in the literal sense. Knowing this creates a tension within the listener, which is the second step toward comprehension. To resolve the tension the listener searches for ways that highways and snakes can be alike and, in the process, comes to Ortony's third step, creation. The listener may decide that snakes are long and thin, highways are long and thin. Now the statement makes sense, the tension is removed and the listener has a new view of highways.

Petrie and Sticht⁶ pick up from this point and discuss the pedagogical implications of metaphor in more detail. Borrowing from Piaget, Petrie classifies knowledge into two categories: assimilation and accommodation. Literal language requires only the assimilation of existing frameworks of understanding, but accommodation requires movement in those frameworks, or even the creation of new

6. Petrie and Sticht, as well as being guest essayists in Ortony's book, are also authors in their own right. Their discussions in Ortony complete the general/theoretical to specific/practical flow of the work. In a sense, the plan of Ortony's book parallels my own in this chapter. Unlike Ortony however, I see the theoretical as introducing the practical and, as a result, I am more interested in the things Petrie and Sticht have to say. I will return to their ideas later in the chapter.

frameworks. This echos Herbert who, writing in 1898 in LETTERS AND LECTURES ON EDUCATION said, "New things are learned by being related to things already known." (See also Wittgenstein, cited earlier) He called the process "appreception." (pg 24) Petrie describes it as providing a bridge between the known and the unknown for the purposes of comparison, requiring that the student act rather than hear and understand literally.

The teacher produces the metaphor and students must act on it to discover its meaning by shifting their frames of reference around to accommodate the new data. Metaphor begins a process Petrie calls "Triangulation" that leads a student from an old framework to a new one which is shaped by further metaphors from the teacher. Even though Petrie describes metaphor as a process of comparison, he realizes that the process is often an interactive one. Using the example "Virginity is the enamel of the soul" he describes how that could be a comparative metaphor for someone familiar with the background of the quote, or an interactive one for someone who, because of a lack of familiarity, was forced to build the meaning from the literal. The listener must perform an act on the statement, and from that act meaning emerges. The complexity of the act is dependent on the contextual knowledge the listener has.

With this in mind Petrie counsels caution when using metaphors in an educational setting. What may work extremely well in one setting may become disastrous in

another depending on the types of knowledge frameworks brought to the class by the students. Reverberations of the thought of people like Black, and warnings that go clear back to Plato echo through Petrie's discussion. Still, in his view, the risks are worth the benefits. Using a physics class as his example he describes, in Ortony's METAPHOR AND THOUGHT, a four step process for teaching the relativity of motion. First an anomaly is introduced in the form of a chair placed in front of the class. Is the chair moving? No, the students respond. Yes it is, because the earth is moving through space and the chair is on the earth. Step two is to make the anomaly explicit which is done with the example of a book on the seat of a car that is moving. Is that book moving? Yes it is. Now the anomaly can be solved by a discussion of motion relative to frames of reference. The last step is called adjustment in which any lingering confusion is cleared up by using more examples of the car and book type. During this exercise the students are talking and writing as they accommodate the new information into their own frames of reference. This discussion anticipates studies by Verbrugge and McCarrel, as well as Ortony that showed not only was metaphorical learning no harder for students than literal learning, it was remembered more explicitly and for longer periods of time.

Sticht's discussion parallels that of Petrie's, but emphasizes that students who are allowed to produce their own metaphors get a higher level of understanding from the

lesson than those who have metaphors produced for them. He quotes from "On Going Beyond the Literal, " a 1976 study by Silverman,⁷ cautioning that teachers must know what background knowledge their students possess in order to construct useful metaphors, and to provide the context in which students can construct metaphors on their own. Since I see spatial visualizations as a kind of metaphor constructed by the students, these discussions were of particular interest to me. I also saw shadows of schema theory as explained in Adams' "A Schema Theoretic View of Reading"; Rosenblatt's "Toward A Transactional Theory Of Reading"; and Langer's "Facilitating Text Processing: The Elaboration Of Prior Knowledge.

Sapir reflects the semantic view of metaphor in the 1977 book THE SOCIAL USE OF METAPHOR. He says, "Metaphors are tropes. Tropes operate on meaning." (pg 8) His views are similar to Black, Ortony and Richards. Instead of topic, vehicle and ground he refers to the elements in his discussion of the workings of metaphor as departure, intermediary and arrival. His example, "George is a lion," describes George as the departure, the proper characteristic

7. There are literally hundreds of studies on a multitude of aspects concerning metaphor, but it is the areas in which Petrie and Sticht focus their discussions that are of most concern to my study. I mention Silverman's study here over other studies because it focuses on areas (metaphoric comprehension and its use in the classroom) that are central to my investigation. I will review these concerns in more detail later in the chapter, specifically in the discussion of Berthoff.

of lionness (mammal, courage etc.) as the intermediary and lion as the arrival. The intermediary defines the relationship between the departure and the arrival.

Whether semantic, pragmatic, or philosophical the authors I read concurred that metaphor is an effective and valuable, if sometimes dangerous, device. Another idea most of the authors I read concurred with was the seminal nature of two studies, one by Verbrugge, one by Ortony, which began to document in empirical terms what observers of metaphor had long discussed in theory.

Verbrugge, along with Nancy McCarrell, conducted a study in 1977 titled "Metaphoric Comprehension: Studies in Reminding and Resembling" in which they attempted to demonstrate the superiority of metaphor as a long term learning device. Using Richards' characterizations of the elements of metaphor as topic, vehicle and ground Verbrugge and his associates read sentences of the form "Topic is like Vehicle" to listeners. A sample statement was "Skyscrapers are honeycombs of glass. ("are partitioned into hundreds of small units" is an example of the ground that would go with this statement.) "In most cases the statement of the implicit resemblance (the ground) was very effective in prompting recall of its related metaphor." (pg.505) Sentences were judged correct if the listener recalled both topic and vehicle.

Two lists of topics and vehicle sentences were read to groups of undergraduate psychology students. Then they were

given slips of paper on which were written the ground sentences and asked to match the topic/vehicle statement that seemed most appropriate. Variations of this procedure using different combinations of prompts and statements and even metaphors that were very unusual, "Tree trunks are like babies with pacifiers," for instance, produced similar results. The mean proportion of sentences recalled ranged from .70 to 1.00 depending on which of the elements of the metaphor (topic, vehicle, or ground) was used in the statement, and which in the prompt. When the lists of topic/vehicle statements were paired with the set of grounds which did not coordinate in meaning, the mean proportion of sentences recalled dropped from .22 to .26.

Verbrugge suggests several explanations for these results; that they are "consistent with the hypothesis that subjects infer a resemblance during their initial encounter with a metaphoric sentence and that resemblance is integral to what is stored as a memory of that experience;" (pg 505) that "The vehicle plays a critical role in comprehension and recall of metaphoric topics;" (pg 510) that "the comprehension process results in a partial identification (or fusion) of the topic and vehicle domains;" (pg 522) and that "the hypothesis of pre-existing associations between grounds and topic/vehicles provides little explanatory power. Neither the overall level nor the specific configuration of recall can be accurately estimated from the strengths of such associations. At the very least, this

confirms our intuition that recall of a metaphoric sentence cannot be ascribed to a direct prompting of component terms, but involves some kind of match between relationships experienced at the invitation of those terms and the relationship specified by the ground." (pg 523)⁸

While Verbrugge's study mirrored several others, most notably Tulving and Thompson in 1973 and Lakoff in 1972, this was one of the first studies to actively investigate how unusual metaphoric combinations affected listeners, and how listeners would react to being unable to find an appropriate meaning after hearing a topic/vehicle phrase. He was also one of the first to infer that the comprehension process was a transactional one in which the listener was "invited" by the metaphoric statement to develop a meaning from the relationships illustrated in the statement. In a sense, the results of this study were predicted by Paul Ricoeur who, quoted in THE PHILOSOPHY OF PAUL RICOEUR edited by Henry Regean and David Stewart, wrote, "I agree entirely with the 'interaction view'...the metaphor is more than a mere substitution for another literal word which an exhausting paraphrase could reconstitute at the same place. The algebraic sum of these two operations, of substitution by the speaker and of restitution by the hearer or the

8. Not everyone agrees with the behavioral premises that underpin some of Verbrugge's work. This study is important to my purposes because it follows a direction established by Richards, that is, context plays a role in comprehension.

reader, equals zero. No new meaning emerges and we learn nothing." (pg. 140) Of course the fact that these metaphors were recalled better does not necessarily mean that they would be understood better, but, I believe before a lesson can be learned it must first be recognized as such. Frank Smith came at the situation from a somewhat different angle when he said students learn in the absence of the expectation that there is nothing to learn.

Investigations into the process by which metaphors are understood seem to center around Ortony's 1978 study entitled "Interpreting Metaphors and Idioms: Some Effects of Context on Comprehension." Ortony draws on the work of Verbrugge and Searle, among others, to provide the foundation for his investigation. He agrees with Verbrugge (and Richards) that comprehending a metaphor involves determining the ground. He says, "These results [Verbrugge's] suggest that the comprehension of metaphors requires subjects to make inferences about what the ground of a metaphor is--inferences that would not be necessary in the comprehension of literal statements..." (pg 466) In discussing Searle, Ortony mentions a 1975 study by Lucy and Clark which tested the three step process of comprehension Searle posited. According to Searle, the listener first determines the literal meaning of the utterance, then checks that meaning against the context and, if there is a conflict between the literal meaning and the context, the statement is reinterpreted. Lucy and Clark gave their subjects tasks

which involved determining if different requests had been carried out. These requests were direct, indirect, positive and negative in nature. They then compared the response time of the subjects to predicted verification times. As Ortony says, "Clark and Lucy interpreted their results as strong, direct support for Searle's first and third predictions, and as reliable indirect evidence for the second." (pg 466)

The point of these studies, in Ortony's view, is that they both infer an increased processing time for metaphorical statements over literal ones. Whether one argues that the increased time is a result of the listener moving through certain stages, as Searle, Lucy and Clark, do, or that it is the result of "elaboration processes that are constrained by the context," (pg 467) as Verbrugge does, the result is still the same: metaphor seemingly takes longer to understand than literal statements. This is the hypothesis Ortony wanted to test and to do that he gave "vignettes" to groups of undergraduate students along with a "target" which was to be used as a literal or metaphorical interpretation of the vignette.

For example, one target read "Regardless of the danger, the troops marched on." The vignette that was constructed to produce a literal interpretation of this statement read, "Approaching the enemy infantry, the men were worried about touching off landmines. They were very anxious that their presence would be detected prematurely. These fears were

compounded by the knowledge that they might be isolated from reinforcements. The outlook was grim." The metaphorical vignette read, "The children continued to annoy their babysitter. She told the little boys she would not tolerate any more bad behavior. Climbing all over the furniture was not allowed. She threatened to spank them if they continued to stomp, run and scream around the room. The children knew her spankings hurt." (pg 476)

Subjects were placed at a computer terminal and shown a vignette followed by a target sentence and asked to press the space bar when they felt they understood how the elements related. The time it took to press the space bar was recorded for each reading, whether metaphorical or literal. A variation of this approach using idioms such as "let the cat out of the bag" was also done. Ortony found that the greatest difference in time between when a subject understood a literal statement and a metaphorical one was about .8 seconds, dropping to .3 seconds in some cases. Ortony also found that the degree of context given with the statements had an effect on comprehension times. The more context, the less time to interpret the metaphor. This helps confirm Petrie and Sticht who, earlier argued for establishing common understandings in the classroom before building metaphors.

Of his own study Ortony concludes, "Our explanation of these results is that where there is little context the expectations that arise from it [context] are insufficiently

specific for the hypothesis/test process to be effective., and metaphors suffer significantly more than literals. Where there is an abundance of preceding context, the process is hardly less effective for metaphors than for literals." (pg 473) In other words, given a proper context, metaphors do not take appreciably any more time to be understood than literal statements, suggesting the comprehension processes may be similar and metaphor may be more a natural element of language than was previously thought. Ortony concludes that "...when context is read a number of schemata are activated, at least some of which can be used to account for the target....The position that we are advocating suggests that, in general, figurative language is processed in much the same way as literal language. What determines the difficulty of processing is not the nonliteralness, but relatedness to context." (pg 475)

From Aristotle's nouns substituting for nouns and verbs substituting for verbs, to modern psychologists' idea that metaphor may not be fundamentally different from literal language in terms of the process by which it is understood, this trope has remained a centerpiece in language investigation. For my purposes there are two important points to be drawn from the ideas presented by these men. The finding that, given the proper preparation, metaphor is not significantly more difficult to deal with than literal language makes its value as a pedagogical tool rise even

higher, because, and this is the second point, it allows writers a metalinguistic ability that is important when discussing language uses such as writing.⁹ Terms that have become commonplace in composition classrooms such as cohesion, unity and style are actually metaphorical in nature.

These terms are language used about language. They do not represent actualities, but relationships between elements in an essay. Spatial visualization may be a way to build the ground for an understanding of these metaphors that, as the above authors indicate, is essential to successful processing.¹⁰

9. By metalinguistic ability I mean that metaphor gives writers a vocabulary with which to discuss their language. If we could not do this, writing instruction would be limited to marking grammar, spelling, punctuation and the like, because those are the tangible, localized elements of essays. However, Chomsky, among others demonstrated that meaningless, yet grammatically correct, sentences could be written. Any word we choose to describe events beyond the literal, be it cohesion, unity, flow, or some other word, is metaphorical in nature and, in a composition class, language that stands for a set of relationships instead of a particular object.

10. At this point it may seem that spatial visualization has conveniently appeared, but it has not. I make mention of it here as nothing more than another potential ally in the process of helping students learn to write essays, and a reminder of the theme of this work. As writing teachers we have created metaphorical words such as theme, unity and so on to help students by naming that for which they had no name previous to our class. Spatial visualization, at this point is just a non-linear version of those collections of letters to which we have ascribed certain meanings. Later on we will see that it has abilities that go beyond those of words alone.

METAPHOR AND ENGLISH

Of course psychologists are not the only ones interested in the workings of metaphor. Both in and out of the classroom English theoreticians and teachers have discussed and documented the power of this language tool. Almost everyone I read who wrote at any length about metaphor acknowledged a debt to I.A. Richards. Many cited THE PHILOSOPHY OF RHETORIC as seminal to their own work. Indeed, much of what has been discussed above can be found in that volume.

Richards believed that "the mind is a connecting organ," but the "strains" of connecting a metaphor could just as easily lead to confusion as understanding. (pg. 97) He also seemed to anticipate the finding of Verbrugge and others concerning the importance of context when he said, "There is no whole to any analogy, we use as much of it as we need." (pg. 91) We perceive metaphor by some sort of transaction with elements of preexisting contextual material. Support for this position comes from many sources, one of which is Paul Ricoeur who, quoted in THE PHILOSOPHY OF PAUL RICOUER, edited by Henry Regean and David Stewart, writes, "But the semantics of the word demonstrates very clearly that words have actual meanings only in a sentence and that lexical entities-words in the dictionary-have only potential meanings and for the sake of their potential uses in sentences...By saying that, I agree partially with the modern theory of metaphor, from I.A.

Richards to Max Black...more specifically, I agree with these authors on a fundamental issue: a word receives a metaphorical meaning in specific contexts within which they are opposed to other words taken literally..." (Pg. 137-8)

Richards even goes as far as to characterize all thought as metaphoric in nature. Ironically, long before Verbrugge and Ortony began looking into how readers and listeners deal with metaphorical situations, Richards was describing psychiatry and the study of the mind as essentially metaphoric activities, using them as examples of the workings of metaphor in general. He said, "The psychoanalysts have shown us, with their discussions of 'transference' - another name for metaphor - how constantly modes of regarding, of loving, of acting, that have developed with one set of things, or people, are shifted to another. They have shown us chiefly the pathology of these transferences, cases where the vehicle - the borrowed attitude, the parental fixation say - tyrannizes over the new situation, the tenor, [topic] and behavior is inappropriate. The victim is unable to see the new person except in terms of the old passion and its accidents. He reads the situation only in terms of the figure, the archetypal image, the vehicle." (pg. 91) The neurotic person of this example interprets his relationship with a new person by drawing from the ground, or context of his previous relationships. As Ortony's work implies, metaphor may be a natural human attribute, making up more of our

nature than just the part that deals with how we read and speak.

Richards discussed his thoughts on metaphor in more detail in a book co-authored with C. K. Ogden in 1947, entitled *THE MEANING OF MEANING*. There he posited what he called universes of discourse which he used to develop a definition of metaphor. He says, "Whenever a term is taken outside of the universe of discourse for which it has been defined, it becomes a metaphor and may be in need of a new definition." (pg 16) A universe of discourse is a sort of language community with its own set of shared meanings. Richards thought that metaphor provides the fuel that allows for movement within these universes as well as communication between them. His cautioning that a term, once out of its home universe, changes meaning precedes the modern theorists and researchers who, investigating the workings of metaphor, are finding the importance of context to understanding. Richards would say that cross universal terms must be placed into a new context understood by both parties if the communication is to be successful.

In another anticipation of later studies, Richards says, "We use language to learn language and this develops references of greater and greater abstractness and metaphor." (pg 97)

Richards' conception of metaphor as a creating and controlling device precedes the work of Lakoff and Johnson who also determined that our concepts structure what we

perceive. In METAPHORS WE LIVE BY they write, "Most of our fundamental concepts are organized in terms of one or more spatialization metaphors." (pg 16) As examples of these various systems of metaphors they discuss the consistency among metaphors that refer to the up direction as good and the down as bad, as in "My spirits rose," or "his face fell." (pg 16) Citing these and other systems of metaphor they conclude that most of our fundamental concepts are organized around, or in terms of a type of metaphor. Scientific theory and other purely intellectual concepts are based on metaphors that have a physical and/or cultural bias as in "high energy" physics, or the psychological term "high level functions." Metaphors, according to these authors, may be the only way to highlight and coherently organize certain aspects of our environment. Black's earlier "plug the gaps in language" description of metaphor's primary job is a similar concept.

Like Richards, Lakoff believes that metaphor may create realities for us. We define our reality in terms of metaphor, and then begin to act on the basis of metaphor. Lakoff actively discusses the cultural component as crucial to a metaphor's creation. He says, "It is hard to distinguish the physical from the cultural basis of a metaphor, since the choice of one physical basis from among many possible ones has to do with cultural coherence." (pg 23) He believes that a metaphor can be a guide for future action and even become a self fulfilling prophecy. Like

Richards, Lakoff worked to bring metaphor into the mainstream of language. His work paralleled some of Ortony's attempts to demonstrate that common metaphors could be as much a part of our language store as nouns.

Bartel, picking up on Lakoff's work, discovered that popular metaphors seem to pass through certain stages in their lifetimes. He found that they move from literal to symbolic and back to literal again. As an explanation for this movement Bartel suggests in METAPHORS AND SYMBOLS that "Popular metaphors illustrate the flexibility and growth of language. As metaphors are eroded by their own popularity, they are added to our stock of literal words and are then replaced by new metaphors. When we describe ourselves as being upset about something we are using a term that has migrated most of the way from the metaphorical to the literal. But when we say we are going to pieces, coming apart at the seams, unhinged, or unglued, we are using expressions that are somewhere between the metaphorical and the literal, worn but not yet threadbare." (pg 136)

Discussing the origin of metaphor, Bartel argues that it has always been easier to add new meanings to existing words, rather than invent new ones. "About half of the 100,000 new words and definitions added to our language between the publication of the second (1934) and the third (1961) editions of Webster's Unabridged Dictionary began as metaphors; the other half were made by compounding, a process also based on comparison, albeit comparisons that

are much more obvious than those in metaphors (snowmobile, moonwalk, doubleknit, hardhat, spinoff)." (pg 136) Bartel concludes his discussion by saying "... we have reason to suspect that metaphors may be the most important ingredient in the growth of language." (pg 136)¹¹

Researchers may be starting to discover the outlines of what theorists have been discussing for years. Far from being a mysterious and dangerous language device utilized and understood by a select few, metaphor may be as common, and as commonly understood, as the classic "See Jane Run." sentences in the old grammar school readers. For my purposes, however, the implication of a ubiquitous metaphorical ability in language users implies that spatial visualization techniques can help students to utilize their natural strengths in an area which may have previously been closed to them. Authors at least as far back as Herbert have discussed metaphor's usefulness in moving between the known and the unknown. That, coupled with a seeming naturalness of metaphor making among language users,

11. "We have reason to believe..." may not be the most stirring scientific conclusion. My own ideas rest on the shoulders of men like Richards who have thought long and deeply about this issue (some would call this speculation), and the efforts of people like Verbrugge who have attempted to quantify in the laboratory some of the attributes of metaphor (some would call this pseudo-science). Because of the limits of our science and the complexity of human language; however, we are often left to build our case on circumstantial evidence. Like the physicist who tracks sub nuclear particles by looking where they've been because he cannot view them directly, we too study the footsteps of metaphor and make guesses as to the kind of shoes it wears. I will write more about this type of search and what we can hope to achieve with it in chapter two.

suggests spatial visualization may be a successful pedagogical technique.¹²

Embler, writing in METAPHOR AND MEANING, also concurs with the naturalness of metaphor making. He says, "Metaphors are drawn from the empirical observations we make in the world around us." (pg 9) We make metaphors just through the process of going through our daily lives. His thesis is that metaphors provide an overall design, or architecture to our existence. Depending on our culture, we recognize certain styles of design over others, but the fact remains that each society has an overall structure. Embler believes that metaphor provides that structure. He says, "Design is metaphorical...Patterns, shapes and outlines express inner thoughts and feelings, give body and form to beliefs and doubts, hopes ideals needs." (pg 13)

Richards would add that it also allows the speaker to assert his or her individuality by the metaphor that is chosen to represent the situation or person. He was not the first to argue that metaphor allows us to assert a control over our environment. He did not go as far as some who believe that our metaphor actually creates our environment out of the chaos of stimuli surrounding us, but when combining the views of Richards and Embler, a picture of

12. it may seem that spatial visualization has appeared without warning. This is not so. I make mention of it here, along with the discussion of the commonness of metaphorical abilities merely to point out that it too may be simply a common, albeit nonlinear metaphorical form.

metaphor as a multi-faceted, multi-purpose, multi-leveled language device begins to emerge. A metaphor, it seems, can be a badge of personal identity, or of membership in a community of language users. It can be a tool of exploration, or a reminder of one's foundation beliefs. It appears to be the chameleon of language that not only changes its color, but its shape as needed.

Berthoff is concerned with this apparent fluidity of metaphor as well, particularly as it applies to a writing classroom. Like Richards, she believes that thinking is primarily a metaphorical activity. In *THE MAKING OF MEANING* she writes, "Perception is contingent on the mind's capacity for analogizing." (pg 11) She is also aware of the destructive possibilities of metaphor and, in fact, sees that as a necessary first step in the composing process. "The first use of language that a student of composition has to learn, I think, is the generation of chaos. If we don't begin there we falsify the composing process because composition requires choosing all along the way, and you can't choose if there are no perceived alternatives. If we are unwilling to risk chaos, we won't have provided our students with the opportunity to discover that ambiguities are, as I.A. Richards has said, 'the hinges of thought.'" (pg 12)

Chaos may very well be what beginning writers feel as they embark on the composing process. Lacking what the psycholinguists call frames to organize their thoughts, they

are left with the rapid flow of ideas until, by some fashion, they are able to reach into the stream of consciousness and grab something out. Spatial visualization techniques may provide them a method for successfully and consistently completing this step, which Berthoff says is the "moral and pedagogical" responsibility of the teacher: helping them find a way out of chaos and back into order.

Berthoff's view is that modern rhetorical theory does not provide what she feels students need to extricate themselves from the chaos it is necessary for them to use. She says, "... there can be no selection of 'grammatical features' until there is discourse...but those of current rhetorical theory which, following the lead of modern linguists, continually confuse language and discourse, as well as the analytic methods appropriate to one or the other." (pg 17) Her view of modern rhetorical theory is that each school has contributions to make, but none seem to go far enough in their reasoning. "Psycholinguists, like many other kinds of linguists, have neither interest, nor method for defining the role of intention, purpose, or context," she writes. (pg 47)

For thoughts and theories in these areas she turns to the cognitive psychologists, and suggests the linguists do the same. Other schools of thought also have shortcomings. According to Berthoff, there are similarities between modern rhetorical thought, behavioral psychology and positivism "both of which entertain views of language as verbal

behavior, as a signal code, as merely a system of binary oppositions." (pg 122) As an example of this connection she points to Kenneth Pike who, in her quote of him, discusses the "segmentation" of experience into "nameable chunks." Her concern is with Pike's implication that we "manipulate the given," instead of recognizing structures and thus giving the mind the ability to find meanings. This debate carries reverberations of the res/verba battles from ages past. Does meaning exist and become recognized by man, or is there no meaning until there is man to confer it.

Berthoff is squarely in the latter camp. She concludes her argument against the linguists by saying, "Despite the talk of process and the active choices of an engaged composer, the new rhetorics, like the old rhetorics they claim to supplant, conceive of a world 'out there' that is to be manipulated by the writer...Modern linguists cannot help us because virtually all schools are founded on the notion of the sign relationship as dyadic, constituted by a signifier and a signified." (pg 125) Her view endorsed by Peter Elbow who devotes an entire book, *WRITING WITH POWER*, to developing techniques for putting the writer in the center of the writing process as both creator and evaluator of knowledge. Discussing this dual role for the writer he says, "I am implying, in effect a roughly Freudian or depth psychology model of a murky unconscious pool full of powerful, threatening energy. But there is also a less lurid model that underlies what I am saying about voice-

roughly Piagetian: that the attainment of real voice is a matter of growth and development rather than mere learning. In attaining a new stage of development, you move from one mode of functioning to a more complex, sophisticated mode. In the process, skills can fall apart. There are lots of things you did well with that old mode which you now bungle." (pg 302)

To replace a mechanistic, manipulative view of language, or, more specifically, of the composing process, Berthoff suggests a concept she calls "forming." Forming is the process of seeing relationships methodically. "Relationships can be spatial, temporal and casual; they can be classified, defined, rehearsed, rediscovered continually." (pg 125) Her thesis is that we, as teachers, do this already. We are continually discussing parts, wholes, comparing, contrasting, formulating, remembering, predicting and so on in the teaching process. We are taking data and using it to form concepts, yet, in the classroom we approach writing as if it were a frog stretched out on the dissecting table to be dismembered organ by organ, with little discussion of how the parts work together to make a living creature. Berthoff suggests that we take the means by which we organize the knowledge in our field of expertise and apply that process to the classroom. This would have a couple of immediate beneficial effects. "Happily, seeing relationships methodically is as much the defining characteristic of coherent writing as it is of coherent

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thinking: that's why we can teach critical thinking by means of teaching writing and vice versa." (pg 56)

To accomplish these goals in the classroom, and to combat the effects of the linguists, Berthoff has several suggestions. Reflecting the work of Embler, she says, "Observation is central to all disciplines: learning to look and look again is learning to question." (pg 55) Echoing Richards she says, "Learning the special language of a field is a principal way of learning the concepts of that field." (pg 139) She suggests that students be immersed in the four modes of language, speaking, listening, reading and writing, in order to develop what she calls "Associative Thinking." (pg 140) This is the ability to visualize the larger structure, or pattern, of relationships that exist among ideas. Similar to Richards' universes of discourse, associative thinking also allows students to move between universes because of the ability to form and reform meanings according to the needs of the situation in which they found themselves. This is essentially a metaphorical process. "We live by metaphor; we advance by simile; we rise by concepts," she says. (pg 140)¹³

13. I focus on Berthoff as a representative of a school of thought. There have been studies done since the early part of this century that show the study of grammar in isolation does not improve writing skills. The same can be said for the study of spelling, or the memorization of vocabulary lists, or the study of model writers. Berthoff and those who stand with her speak for a synthesis rather than further analysis. She is for the study of relationships between elements of writing rather than the elements themselves. She sees writing as a metaphorical activity rather than the application of a set of rules. As

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Branscomb gives focus to these same thoughts when, in an article titled "Turning The Corner: Story To Meaning In Freshman Composition Classes," he says one of the problems with courses like freshman composition is the students "were writing about their experiences rather than writing from them." (pg 664) In order to move the focus from outward to inward Branscomb argues that a writer must believe an idea is truly significant before he or she can write about it. He sees meaning as a goal. In other words, he was trying to teach his students to metaphorize their experiences into a meaning, or group of meanings for the audience to discover. Branscomb wanted his students to paint a picture of their topic, rather than snap a photograph, and to do that they had to discover, within themselves, what was significant about their journey.¹⁴

Linda Flower is also concerned with ways students discover what they wish to write about, and, like Branscomb and Berthoff, she believes that discovery is an internal one rather than an external manipulation. Flower sees the

we learn more and more about the language user we keep coming back to patterns, relationships and symbols. We seek to include with language, rather than exclude. We try to bring elements of experience and environment together for meaning rather than isolate them from one another. It seems to me that is what Berthoff is trying to do as well.

14. H. Eric Branscomb teaches freshman composition at the University of New Hampshire. I include his article here as an illustration from a pedagogical viewpoint of some of the ideas discussed more generally by people like Berthoff--namely, that meaning is discovered within the meaning maker rather than imported from the environment.

composing process as one of developing short and long term goals around the ideas discovered by the forming process. Her focus is on the production and fulfillment of goals, but the process she outlines is metaphoric in nature.

According to Flower, writers use two types of goals which are intertwined. In an article titled "A Cognitive Process Theory Of Writing" she says, "Writers create their own goals in two key ways: by generating both high level goals and supporting sub-goals which embody the writer's developing sense of purpose, and then, at times, by changing major goals or even establishing entirely new ones based on what has been learned in the act of writing." (pg 366) Her assertion that the goals embody the writer's "developing sense of purpose" and change "based on what has been learned in the act of writing" place her squarely in the school of thought that views thinking, and subsequently writing, as a metaphorical process. Flower's writers make meanings in a process similar to Black's fusion. Taking a step beyond Berthoff, she is looking for the attributes of forming as they manifest themselves during the composing process. She is investigating the way writers make and use metaphor.

Flower proposes a highly structured arrangement to these types of goals. "These processes have a hierarchical, highly embedded organization in which any given process can be embedded within any other. (pg 366) Flower's use of the term hierarchical, along with the psycholinguists term frames, suggest an overall shape to the developing

composition that provides the boundaries within which forming and planning take place. I believe what Flower is describing is the abstract version of my concept of spatial visualization. Even though the writer's attention is focused on the ideas he or she wishes to write about, those ideas must have some sort of priority, some reason that they are pushing their way into conscious thought rather than some others. I think the hierarchy, the form, is the seedbed of composition within which the ideas take root and grow. Of course the push/pull of ideas change the shape of the structure as much as the direction of the developing essay, but if, by visualizing the structure, a student can recognize the metaphorical elements to writing a little better, then some of the assertions of people like Verbrugge and Ortony, among others, may come into play. By that I mean, if language users are natural metaphor makers, then being able to visualize and control some of the metaphorical elements of writing previously outside of their awareness, may help them to become more efficient, metaphor users.

As Flower says, organization appears to play an important role in creative thinking and discovery, since it is the process by which ideas are grouped and new concepts formed. "The act of composing itself is a goal directed thinking process, guided by the writer's own growing network of goals." (pg 366) There are elements of Berthoff's associative thinking in this concept and, further back, Richards' idea that we use language to effect control over

our environment. Of course Berthoff and Richards were not the first to recognize this aspect of metaphor. St. Augustine remarked on the power of metaphor as a teaching tool, and before him even Aristotle knew that metaphors have the power to shape behavior. More recently, in an article titled "Pre-Text And Composing," White has written, "...the writer's pre-text, or mental construction of 'text' prior to transcription, is such an important composing phenomenon that theoretical and empirical research in writing must deal with it expressly." (pg 397)

The area with which Flower deals expressly is limited to specific elements of the writing process, but the methods writers use, and results they obtain, may merely be repetitions, on a smaller scale, of what philosophers and researchers have been describing for years. That is, meaning is grown along a continuum from loose and formless to structured and labeled according to a progressive recursive, user centered process flowing out of real and virtual experience.

Flower calls the two types of goals writers give themselves process goals, which refer to instructions writers give themselves, such as "let's doodle," and context goals which specify what the writer wants to say to an audience. In both cases however, Flower specifically points out that "The most important thing about writing goals is the fact that they are created by the writer." (pg 373) In other words, like Berthoff, she sees writing as an inner

directed rather than an outer directed process. Since, as Flower discovered, these writers created their material by internally rearranging and selecting elements of their experience, spatial visualization techniques could become an important tool in establishing order from the chaos of thoughts and feelings flowing up from memory because they provide a record of thought. Flower says, "The problem with long term memory is, first of all, getting things out of it—that is, finding the cue that will let you retrieve a network of useful knowledge. The second problem for a writer is usually reorganizing, or adapting that information to fit the demands of the rhetorical problem." (pg 71) I would add that even when the proper networks are activated, the rush of thoughts through short term memory, coupled with the other demands of solving rhetorical problems, often make it difficult for writers to slow the process down long enough to get any useful information out of it. Spatial visualization may provide them with a corral in which to collect their thoughts and line them up for the drive to completion, a process Flower calls "Translation."

To illustrate her thesis, Flower and her colleague John Hayes developed a procedure called protocol analysis in which they encourage writers to "think out loud" as they go through the writing process. By taping and later analyzing these sessions they are able to study the writing process as it develops. Of course there are pros and cons to this approach. Flower defends her method this way, "...people

rapidly forget many of their own local working goals once those goals have been satisfied. This is why thinking aloud protocols tell us things that retrospection doesn't." (pg 377)¹⁵ For my purposes though, it is enough that writers rely on a plan, and that plan is developed along with the ideas that populate it.

Perhaps, since at this stage all is abstraction, better writers are the ones more able to cope with multiple abstractions, and, somehow, to bring those abstractions down to the written page, whereas basic writers cannot develop either the ideas, the structure, or both simultaneously that would allow them to move from thoughts to drafts. Flower is not the only researcher to document this behavior: "Sondra Perl has seen this phenomenon in the basic writers who kept returning to reread the assignment, searching it would seem, for ready made goals, instead of forming their own." (pg 379)

Perhaps these writers, not realizing the true extent of the metaphorical situation they are in, are simply searching the literal assignment looking for what, in their eyes, must have been overlooked on the first reading. In another vein, this situation is comparable to Ortony's steps to metaphoric comprehension, except that the students have no way to resolve the tension created by the anomaly.

15. For a more detailed discussion of the advantages and disadvantages of protocol analysis, see chapter two.

Linn believes that this misdirection in composition classes leads to certain of the problems we see today. In his article titled "Psychological Variants Of Success: Four In Depth Case Studies Of Freshman In A Composition Course" he examines the background of four college freshman composition students in an attempt to discover how different factors unite to "create the student as we encounter him in our writing courses." (pg 903) Linn's students, an Hispanic, a female from a Catholic school background, a veteran, and an inner city black, are all products of a method of teaching that disconnects their natural metaphor making ability from the composing process. In a sense, Linn is saying that these students were created by the system in which they found themselves, and, in which they have little part to play. "For I believe it is only in such an attempt at an overall understanding of the student in psychological, sociological, economic, and even racial terms, that we can begin to really help him or her to realize their potentialities. To focus almost wholly on the subject matter, or to believe that any one pedagogical methodology will enable us to teach well, is to be terribly shortsighted." (pg 917) In other words, any system of instruction that ignores the role of the student as a creator is merely form taking precedence over meaning. By arguing for the importance of experience in a composition class, Linn is sounding the same call as Flower, Berthoff, Richards and so on. Without experience as a valued element

we are left with writers like "M. O'Brien, female, parochial school background. Handwriting flawless; grammar excellent; mechanics, perfection itself; content, dull and characterized by timidity and an almost total lack of originality." (pg 906) ¹⁶

Technique, however, for those who know it, can be very comfortable. M. O'Brien may not have written very startling prose, but she was very good at what she did. Grammar can be measured, practiced, pointed to and talked about. Other aspects of writing, such as the abstract, seemingly unstructured nature of the composing stage, are more slippery. When we ask students to move their attention and efforts out into that unknown it can produce anxiety, just as any venture into the unknown, whether it be an essay, or a drive in an unfamiliar city, can be a cause for unease. As Linn says, "Dealing with the problem of students' insecurity is probably the most difficult task that one involved with [teaching writing] faces." (pg 910)

It can be even worse for students such as Jimmy C who, unlike M. O'Brien didn't have a familiarity with mechanics on which to fall back. "Jimmy C, a student of Hispanic origin. His prose is characterized by lack of idiomatic

16. Of course M. O'Brien and her fellow classmates are caricatures, exaggerated to make a point. The argument Linn is making, and the reason I have included it here, is to show the ease with which we overlook the internal nature of meaning making in writing classes, and the disturbing effects that oversight can have. These four students may be fictional characters, but, like all good characters, they are drawn from truth.

correctness. His punctuation is slipshod. He seems to lack all sense of where one unit of thought ends and another begins. His paragraphs lack topic sentences and, in general his essays lack the characteristic tripartite structure: Introduction, body and conclusion." (pg 904) Similar difficulties also await "Joe S, Afro-American. Prose designated as Black English, little sense of conventional syntax, handwriting almost illegible, work turned in irregularly." (pg 911) Linn sees no help for these students unless some attention is paid to the people they are, rather than the symptoms they manifest.

He agrees with those like Berthoff, who would turn composition inward and attempt to awaken within the individuals a sense of their own ability to make meaning from experience around them. Linn's advice to those who must deal with students of this type is heavily psychological, even sociological at times, but underlying his prescription is the idea that the student plays a central role in the process of learning to write, yet they may not be aware of that themselves. As he says about James Q, "Bright, fairly well read, but lacking in confidence. He is a student encountered more and more because of the current trend toward adult education." (pg 908) James Q. has mastered certain techniques, like M. O'Brien, but has not learned to trust himself in the composing situation. They can write essays that are "reflective, sentimental, worldly-

wise, cynical....," yet they are "fragile," and often have a "negative judgement of their intellectual capabilities."

Linn's suggestion is to work on building the confidence of these writers first, so they will discover within themselves meanings that should be put down on paper. "Confidence can be induced, but it must be induced shrewdly and slowly. Praise given; an assignment especially tailored to show his strengths; the opportunity to read one of his best papers aloud to the class; done slowly, but consistently, throughout a term..." (pg 912)¹⁷ The focus is on the meaning maker at first, not the tools with which he works after the plan is created. Whether Linn's suggestions would, or could be placed in an actual class given the external demands placed on teachers and students by the press of time, curriculum and public is not the issue. His point is that a writing class that does not start with the presumption that students make sense is like a carpenter who has a tool box full of tools, but no plan to work from and no lumber to use.

17. Which is precisely the reason I have included Linn's article in a discussion of this type. As with Berthoff, the issue of where meaning resides is important to the development of competent, confident language users. Linn takes Berthoff's discussion in a different direction by exemplifying the negative effects of a system that allows no place for the meaning maker in the meaning making process. I intend this as an example of the potential value of spatial visualization techniques because it shows what can happen when there is no provision made for self discovery of meaning. It shows what can happen when students come to the belief that meaning is externally identified rather than internally discovered. Spatial visualization, in this scenario, may be a prime tool for the internal discovery of meaning.

Linn admitted his opinions and conclusions were "impressionistic" but two, more formal studies by Daly seem to bear out his assumptions. In one study titled "Writing Apprehension And Writing Competency," 3,602 undergraduates, mostly freshmen, were given the Miller-Daly test of Writing Apprehensiveness, and a 68 item, multiple choice test of writing competency. The test of writing apprehensiveness had been found to be "highly reliable across diverse samples of respondents," and the multiple choice writing skills test focused on skills "most often identified by a set of experienced composition instructors as most relevant to 'good' or 'competent' writing." (pg 11) 18

Daly's hypothesis was that those with low apprehension towards writing would perform better on the test of writing skills than those who were more apprehensive. The results bore this hypothesis out. "As expected, low apprehensives scored significantly better on comprehensive tests of grammar, mechanics, and larger concerns in writing skills." (pg 10)

18. I include Miller and Daly's comments here because teachers value certain behaviors in students, and students have certain ideas about what teachers expect. Miller and Daly are investigating an area in which those mutual expectations either clash, or compliment one another. I see spatial visualization as potentially helpful in this area because it provides a written record of an otherwise abstract process, and allows for mid-course corrections by the student under the teacher's guidance. It improves communication during the process, rather than waiting until it is over and then relying on what the student often sees as too little, too late. I will return to this idea in the discussion of Dilworth's study.

Daly admits that "cautions" need to be taken concerning how his terms are understood. Still he sees the results as an important finding. "The present research demonstrates an important correlate of writing apprehension. High apprehensives not only write differently and with lower quality than low apprehensives, but, in addition, fail to demonstrate as strong a working knowledge of writing skills as low apprehensives." (pg 13) There are many conclusions that can be drawn from the relationship of writing skill to writing apprehensiveness, but, for my purposes, the important one is that there is a relationship between what students think they know about writing and how they feel about their abilities as a writer. In other words the writer affects the writing.¹⁹ Daly has arrived, from yet another direction, at a place occupied by the likes of Berthoff, Richards, Petrie and Sticht, to name a few. As he says, "An individual who fails to exhibit the appropriate and necessary writing skills is unlikely to find much success in writing activities. This should maintain the apprehension, which in turn, may maintain the avoidance of practice and evaluative feedback. However, the directionality of the effect was not probed in the current

19. It is not necessary to accept Miller and Daly without comment. They are included here to show the importance of getting teacher and student expectations going in a complimentary direction. Spatial visualization may help in this regard because, among other things, it opens discernible lines of communication much earlier in the writing process.

investigation. Whether apprehension or skills weakness develop first, or alternatively emerge simultaneously and interactively, remains an unanswered question." (pg 13) (See Stephen Judy's THE ABC's OF LITERACY for a discussion of the importance of writing practice.)

While Daly was describing only the students who took his test, and using the only definition of competency at hand, the same can be said for any definition of writing skills, or description of the causes of students apprehensiveness. When the rules are changed from what the students are used to, apprehension will rise. Little emphasis has been put on explaining the abstract and chaotic nature of the early stages of the writing process in most traditional composition classrooms, as Berthoff pointed out, consequently, it is the process of getting started that students complain about the most. Spatial visualization may do two things in this area--teach the students some of the skills necessary in the opening stages of writing and provide them with a way to measure and evaluate what is going on during those first stages of composition.

In his first study Daly looked at the relationship between students' internal beliefs about their ability and its effect on their level of confidence. In a classroom setting, however, there is an important third element in this relationship, the teacher. Like Linn, who saw the teacher's recognition of the basic humanity of the student as crucial, or Berthoff, who saw the teacher as the key to

moving from chaos to order in a successful class, Daly is also interested in the effect the teacher has on students. In an article titled "Writing Apprehension In The Classroom: Teacher Role Expectancies Of The Apprehensive Writer" Daly explores his hypothesis that the teacher has a strong impact on the writing behaviors exhibited by student writers.

To test his ideas, Daly took 33 elementary and secondary school teachers and asked them to rate groups of hypothetical students according to certain categories such as overall academic work, future academic potential in certain subject areas and potentiality for discipline problems. "Subjects responded to the items on nine step, evaluative scales. For example, subjects were asked, 'How well will Mary (Jimmy) do in mathematics?' Followed by a nine step response scale bounded by the terms 'very well' and 'very poorly.'" (pg 40) Daly believes that what he found confirmed his hypothesis, as well as Linn's impressions, and makes Berthoff's definition of the role of the teacher central to the composing process. In a sense, even the relationship between the teacher and students is metaphorical, as each participates in the process that not only creates meaning on paper, but may even create the student who must write the papers. As Daly says, "The main effect for writing apprehension indicated that the highly apprehensive student was evaluated less positively than the low apprehensive one. More particularly, the individual who appears to have tendencies to avoid writing was seen by

teachers as less successful in a variety of different academic subjects, less likely to succeed in the future, and less likely to receive positive recommendations from them to other teachers." (pg 42) 20

Daly stops short of placing the entire responsibility for the student/teacher relationship on a perception of the students' apprehensiveness, or lack of it. "Other cues may affect the perceptions teachers form of students. It would be incorrect to assume from the present research that writing apprehension represents the major, or even one of the major, cues utilized by teachers to form their perceptions of students." (pg 43)

The implication of this study with which I am most concerned is, again, the idea that meaning is created rather than discovered externally. The students' ability to recognize themselves as meaning makers may be an important first step in the metaphorical process. The value, if any, of spatial visualization techniques would be lessened considerably if students are not convinced they possess meaning to share. Spatial visualization is, at base, an internal technique. Unless students are able to journey within themselves my procedure could very well be meaningless.

20. It seems teachers may be making assumptions about a student's entire character based on how he or she measures up in the classroom. Spatial visualization may reduce this level of assumption because it enables the writer and the teacher to "see" the creative process together as it unfolds, and thus be able to discuss their expectations while adjustments can still be made.

Black, Ortony, Verbrugge and others described the way metaphors operate on language users. Richards, Embler, Berthoff and others discussed its wider implications concerning the means by which we make our way in the world. Flower brought it into the composition classroom, Linn factored in the teacher and Daly measured the interaction between the two. While they might not agree on whether metaphor creates meaning, or alters it; whether it is a natural, inescapable element of language, or a learned usage; or whether the teacher plays a greater or lesser role in the guidance of metaphorical thought, it is fairly obvious that they all put metaphor in a position of great importance. Whether that position be in reference to language as a whole, or closer to my concerns, the composition classroom, in no way detracts from the centrality of the issue.

VISUALIZING METAPHORS

It is a pedagogy of metaphor in the composition classroom that is the point of my study. Specifically, the aspect of metaphor I refer to as spatial visualization.²¹

It appears that the theory of composition that is most comfortable with the possibilities of metaphor is

21. just as a metaphor such as "Rose" is an orthographic representation for an abstract concept such as love, so spatial visualization is a meaningful structure representing what would otherwise be abstract relationships between ideas in an essay.

psycholinguistic in nature. I say this because it is a psycholinguistic theory that implies the creation of meaning by the writers rather than, as Ney points out in "Notes Toward A Psycholinguistic Model Of The Writing Process," a "behavioristic" response to stimuli. As an example of his thesis, Ney uses a sentence combining exercise he performed with fourth graders. "...the behavioristic model is contradicted by observations gleaned by this researcher from experiments with fourth grade students, whose improvement in certain tasks resists practice of any kind. For instance, conjoined adjectives are extremely rare with children at this grade level...In spite of this, this researcher made an attempt with one fourth grade class to have the students join two sentences to form a third with coordinated adjectives..." (pg 158) Ney put the children through three, half hour practice sessions and, at the end, had less than a third of the children combining the sentences correctly using the adjective form. He concludes, "A behavioristic explanation of the effects discovered in transformational sentence combining would lead to the expectation that the students would improve with subsequent practice." (pg 158) Apparently, practice alone is not sufficient. The children must be "developmentally" ready for the language form and then they will pick it up, "before, or during the first practice session." Giving the students practice with the forms of language before they are ready to somehow attach meaning to those forms, is often counterproductive.

However, once they are prepared for the forms by experience, or by reaching some developmental level, practice beyond initial familiarity may not be necessary.

Using this illustration, Ney argues for a model he calls the "Language Acquisition Device," which he explains as "Input sentences are filtered through a syntactic grid and stored as semantic units before they are processed through the same syntactic grid to be produced as output sentences. (pg 162) The important idea is that language is stored as meaning units, not in classifications of usage. Syntax is only used to point the way to meaning. The semantic relationship is essentially a symbolic one, which places the entire process within the realm of metaphor.

Ney believed that sentence combining provided a way for students to reach into that semantic storage unit because it provided them with "...the ability to encode semantic units and decode them in a given syntactic form." (pg 164) Whether one agrees with Ney's method or not, the fact remains that meaning (semantics) appears ahead of form (syntactics) in describing the process by which sense is made on paper.

Daiute also subscribes to the psycholinguistic theory of writing, but she is specifically concerned with the activities in what Ney calls the semantic storage unit, or memory, and how a writer uses memory to assist in the planning process during the early stages of composition. Writing in an article titled "Psycholinguistic Foundations Of The Writing Process" and borrowing from a theory related

to psycholinguistics called the interactionist theory of sentence production, she draws a set of assumptions based on the research of people like Fordor and Bever. "According to this view [interactionist] sentences are produced via a set of structural clause frames that do not have to be reconstructed for each utterance because they represent the major surface structure forms of the English clause. The speaker monitors the meaning of the prior clause while producing the subsequent clauses that depend on it. If monitoring prior clauses and producing new ones occur simultaneously, the speaker must use strategies that overcome performance constraints on short term memory." (pg 6)

There are two important elements in this passage in terms of my interests: one, the by now familiar reverberations of meaning as an internal construct and two, the limits of memory in the composing process. Here is a specific mention of the limits of memory and the accommodation the writer, or in the above example, the speaker, must make. Later, Daiute will call this the memory constraint hypothesis and point out that it may make writing, particularly composing, difficult unless a way is found to "increase short term memory capacity." Spatial visualization may assist in solving this problem in that it can take the pressure off of short term memory by providing an external record of thinking. As ideas bubble up from long term memory, instead of having to be acted upon

instantly, spatial visualization provides the writer the ability to record them for later study after the initial rush of ideas has subsided.

To begin describing the ways in which writers may deal with this constraint, Daiute analyzed syntax errors from 215 placement exams written by New York area college freshmen. These exams were written in a regular 50 minute class period. As she says, "The errors were then classified within the framework of the writing model and analyzed to identify the characteristics showing that they could result from short term memory limits." (pg 10) The model of writing Daiute is describing is one that posits sentences planned around sets of syntactic frames. Clauses and other lexical items are then placed into these frames. The model, similar to Flower's, suggests that writers use "goal directed recording processes" to help them remember more complicated clause arrangements. Of course these goals rely on the amount of syntactical information available to the particular writer.

What Daiute found tended to confirm her memory constraint hypothesis. "...the frequent occurrence of strong perceptual clauses before error onset suggest that the sentence problems begin after initial sentence sequences have been semantically recoded, making inaccessible the grammatical information necessary for the correct completion of the sentence. The information that usually fades after recoding is placement, number and form. Thus the recoding

hypothesis offers an explanation of why, in error sentences, predicates are based on adjacent words, rather than the appropriate structural forms appearing earlier in the sentence [The recent outbreak of riots are upsetting and disturbing to the peace efforts.]; why modifiers are not next to the words they modify [The children were driven away in busses with big windows laughing and smiling.]; why units with parallel function do not appear in parallel form [The main purpose of government is representation and to protect the rights of citizens.]; and why words are repeated or left out. [Your achievement in life can be very good in life but every American does not want to do a lot of work.]" (pg 17-18)

Like Ney, she found that the focus in the writer's mind is on meaning, and, perhaps because of the limits on short term memory, the syntactical arrangements necessary for an acceptable formation of that meaning get forgotten, or perhaps shunted aside to make more room for idea generation. The Tibetan philosopher Chaung Tzu described the situation this way, "Fishing baskets are employed to catch fish, but once the fish are got, the men forget the baskets; snares are employed to catch hares, but when the hares are got, men forget the snares. Words are employed to convey ideas, but when the ideas are grasped, men forget the words." He was speaking about receiving messages primarily, rather than composing them, but the same point applies at both ends of the process. In the attempt to generate and transmit ideas,

meaning takes precedence over form. Unless sufficient time is provided and sufficient guidance available to turn the reaction that generates ideas into the response that produces coherent discourse--to bring order out of chaos as Berthoff describes--the difficulties that student composers have to face can not be addressed in any lasting way.

Daiute does not propose a specific method to deal with the compositional difficulties her research describes, however, she does recognize its implications. "This study also has implications for teaching. First, writers should be encouraged to separate clearly the sentence production stage from the editing stage (Emig, 1971; Elbow, 1975). Since syntax errors are psychologically natural, it is pointless to burden short term memory with concerns about correctness during composing, when so much else is going on." (pg 20) Berthoff, among others, also argues that the composing process is essentially unordered, and to try and impose a system of correctness on it before it was completed was counter-productive. Spatial visualization techniques, by providing a written record of the composing process, sometimes in no particular form except that chosen by the author, may provide a way to "clearly" separate the two stages of the process. In addition, by legitimizing the composing process with a written record that is not an essay, it may take the pressure off of student writers who often believe they must produce acceptable prose at the same time they are producing ideas.

Like Daiute, Flower and Hayes recognize the important role memory plays in the composing process. Taking a somewhat different tack in "The Pregnant Pause: An Inquiry Into The Nature Of Planning," they chose to focus on what is happening when writers pause during the composing process. They point out that "There is a good deal of support for the hypothesis that pauses reflect sentence-level linguistic planning..." (pg 230) From this evidence, and their own observations, they developed two hypotheses concerning what was occurring in the mind of a writer who was not writing, but thinking about what was about to be written. "Our first hypothesis, which we can call the linguistic hypothesis, can be briefly stated as 'writers pause in order to generate or plan what they are going to say next.' Our second hypothesis, the rhetorical hypothesis, says that 'when people pause for significant lengths of time, they pause in order to carry out more global rhetorical planning or problem solving which is not necessarily connected to any immediate utterance or piece of text.'" (pg 230) It seems that the composing process is not sequential or chronological in nature. A writer may be simultaneously concerned with the next sentence, and audience reaction after the essay has been read, all at the same time. Further, each concern must be weighed and acted upon as it has a place in the generation of the finished product, whether that be a sentence, or even just a clause step in the sentence building process.

To test their hypotheses, Flower and Hayes studied the composing processes of four writers, three expert and one novice. Using their method of protocol analysis they analyzed the procedures these different writers employed as they composed. They chose the protocol analysis method because ... "protocols give us an extraordinarily detailed blow-by-blow record of a writer's constantly shifting conscious attention, and by capturing the flow of concurrent thought processes, protocols avoid the unreliability of retrospective generalization." (pg 232) ²²

What they found caused them to modify their hypotheses somewhat. They discovered that planning goes on at many levels besides the sentence level, which is "only part of the process of the mature, or experienced expository writer. Writers spend time and conscious attention creating guiding rhetorical plans which represent not only the audience and the task, but the writer's own goals. It is not enough to think of writing as simply a process of text production, or deciding what to say next." (pg 242) They found that the planning process is "episodic," but those episodes are not necessarily related to patterns in the essay. The writers they studied tended to work around the setting and achieving of certain goals rather than around elements of the text. "Understanding the overall architecture of these

22. There are those who are not as convinced of the value of protocol analysis as Flower and Hayes. A more complete discussion of the pros and cons of this technique is undertaken in chapter two.

episodes and the logic which begins and ends them will, we think, tell us a great deal about how writers combine planning and text production." (pg 242)

Flower has separated text production and planning into two recognizable categories in this passage. As Daiute pointed out, there appear to be at least two separate, but interrelated processes occurring simultaneously in the writer's thoughts during the composing process. Flower and Hayes leave their study convinced that the planning process is controlled by goal setting activities, and that "this continually elaborated network of plans and goals gives logic and structure to the episodes which follow. This network is, we believe, one of the chief outputs of the writer's pregnant pause. But because such plans are rarely expressed in the eventual text, they remain largely invisible to teachers of writing. And yet there is good reason to think that some of the crucial differences between good and poor writers lies just here, in the kind and quality of goals writers give themselves and in their ability to use this planning to guide their own composing process." (pg 243)

"Invisible" is a crucial word in this passage. These plans, whether they be focused around linguistic units, syntactic units, goals, or some, as yet undiscovered structure, cannot be seen in the composition classroom, and as such, can only be taught indirectly. The planning process a student goes through is, as Flower points out,

certainly invisible to the teacher, but, often, it is just as invisible to the student who participates in it. Spatial visualization, like protocol analysis, has the potential of bringing this process out in the open where it can be viewed by teachers and students alike, where it can be identified and perhaps classified, as Berthoff pointed out, so it can enter the lexicon of student teacher interchanges and become a controlled process.

There is a saying among a tribe of south Pacific Islanders that goes something like one does not collect driftwood during the hurricane, but waits the storm out, then picks up the pieces. Spatial visualization could provide students the luxury of riding the storm of composition out, then scouring the beach for the driftwood when things have calmed down.

In a related study titled "Language Structure And Thought In Written Composition: Certain Relationships" by Dilworth, Reising and Wolfe, 100 teachers were asked to have their students write an in class essay on a poem by Richard Brautigan entitled "Star Hole." The papers were graded by the teachers, who then selected one paper that they felt represented a "superior" effort and one they felt was "typical." The papers were returned to the researchers, who analyzed them "...in terms of ten variables judged by the investigators to be the most economically revealing of the interrelationship among syntax, ideation and teacher assessment." (pg 99) What they found was that there was a

"modest but clear" relationship between the papers rated superior and a higher level of abstraction. In other words, English teachers tended to place a higher value on those papers that dealt with the poem in a symbolic vein. The researchers also found that the length of T-units in the essay correlated with the ratings given by the teachers. The longer T-units seemed to produce a higher rating. Summing up their results Dilworth says, "Specifically, the superior students tend to increase their words per T-unit as their papers get longer, suiting their syntactic maturity to the scope of their treatment of the topic. Also, they tend to increase the number of abstractions as their papers grow longer, placing their generalizations and supporting them with specifics. They tend to have more sentence control errors as their paragraphs grow longer, but these 'errors' are primarily sentence fragments serving stylistic functions" (pg 103) The study also found those students who tended to dwell in the higher ranges of abstraction were generally forgiven more "sentence control errors" than papers rated "typical."²³

23. I do not cite this study as a defense of any particular measure of quality in writing. Indeed, personally I have yet to be convinced that longer sentences are necessarily better ones. I point it out, as I did with the Miller, Daly study, to further illustrate the importance of complimentary expectations among teachers and students rather than assumed or even unknown ones. As I have mentioned before, spatial visualization may be a way of clarifying these expectations for the students as the essays develop.

When my study is viewed in the context of Linn's "impressions" of the role of teacher, further detailed by Daly; when consideration is given to the findings of Flower and Daiute concerning memory limitation and its effect on sentence construction, particularly longer sentences; the ideas I present take on the character of a distillation. Teachers want students to deal with ideas and, perhaps reward those who do with higher ratings, even as they forgive grammatical errors. Spatial visualization may be a way for students to concretize those abstract ideas teachers value.

Before students can concretize their ideas, however, they must discover them, either in their own writings, or reflected in the writings of others. In "The Group Mapping Activity For Instruction In Reading And Thinking," Jane Davidson developed a method by which spatial visualization techniques, what she calls mapping, are used to assist students in discovering abstract levels of meaning in what they read. After reading a short story called "All The Years Of Her Life" she asks the students to draw a map or diagram illustrating the relationships they discovered in the story. The students are told that there is no right way to map, no set structure to the map, and that they may not look back at the story as they map. The teacher models the map making activity for the students until they feel comfortable.

Once the maps are complete individual students are asked to explain their particular drawing to the class, and there is general class discussion about the various similarities and differences in the maps. Echoing some earlier studies, particularly Dilworth, Daiute and Flower, Davidson believes "The group mapping activity actively involves students in the reading-thinking process as has long been urged by reading authorities who believe that active involvement maximizes students' comprehension of text...The group mapping activity helps readers' recall and retain text information. The strategy also provides a means for students to generate personal responses in their interpretations of passages." (pg. 237-8)

Another, more formal, study by Charles Holley, et al, titled "Evaluation Of A Hierarchical Mapping Technique As An Aid To Prose Processing" focused on a particular spatial visualization technique, hierarchical mapping, and its effect on memory. In this study, 44 undergraduate psychology students were split into two groups. One group received five and one half hours of training in the use of hierarchical mapping while the other served as the control group. Both groups were asked to read the same 3000 word prose passage and take a test over the material it presented. The test included short answer essay, multiple choice, cloze type questions, and a full blown essay answer section. The study concluded that, "The pattern of results suggests that networking assists students in acquiring and

organizing the main ideas, but does not necessarily help in the acquisition of details. The major differences between the groups occurred on the essay and summary cloze tests, both of which assessed retention of the main ideas. No differences occurred on the multiple choice and short answer tests which were designed to assess detailed knowledge of the passage material." (pg 234)

Whether one agrees with all the conclusions of this study or not, it is an especially interesting result when coupled with the studies done by Daiute and Flower which indicate that it is the main ideas that cause writers, particularly those labeled "basic," the most trouble. Flower found that those writers most of all seem to get bogged down in the details and lose sight of the overall direction they wish to go.

Daiute posited that the demands on short term memory caused by such a focus on detail, particularly in more complex sentences, result in a writer's vision becoming so narrow that he or she may have forgotten what an individual sentence is about before it is completed. (See Frank Smith's UNDERSTANDING READING for a discussion of "tunnel vision," the reading equivalent of the "basic" writer's dilemma.) While no one is suggesting that reading and writing are completely equivalent activities, few would argue that they are both meaning making activities and as such may share common attributes such as a top down process of comprehension implied by people like Flower.

Frank Smith discusses this in more detail from both the writing and reading perspectives in his books WRITING AND THE WRITER, and READING WITHOUT NONSENSE. Peter Elbow also speaks to this issue in WRITING WITHOUT TEACHERS where he says "Make writing a global task, not a piecemeal one." (pg 72) In addition, a 1984 study by Ruddell and Boyle titled "A Study Of The Effects Of Cognitive Mapping On Reading Comprehension And Written Protocols" found that students who used maps as part of the writing process scored higher when those essays were evaluated holistically than those who did not use maps. Further, mapping students in this study also scored higher on pre and post tests designed to measure writing growth. When viewed in conjunction with the studies by Dilworth, who found teachers reward abstract writing, and Daly, who found teachers may make judgements about how their students will succeed (or fail) based on their written behavior, spatial visualization appears to be a possible method of bringing teacher expectation, both realized and implied, together with student performance because it can concretize an otherwise abstract set of processes.

For his part, Holley is convinced that organizational structures such as the hierarchical maps he tested in the above cited study do indeed help students remember and understand. He also makes mention of several other studies that mirror his findings. "For example, in free recall studies, it has been shown that performance varies directly with increases in organizational structure. This occurs

when the structure is created either by the experimenter...or the subject." (pg 231) (As discussed in the studies by Verbrugge and Ortony earlier in the chapter.) Students make meaning by identifying relationships between ideas. Being able to see those relationships, either in a hierarchical map, or some other type of structure, is a help to comprehension.

Borrowing from Davidson, and expanding on Holley's one type of spatial visualization, Jeannette Miccinati attempted to help students bridge the gap between reading and writing using maps. In an article titled "Mapping The Terrain: Connecting Reading With Academic Writing" she describes her experiences. "I have found that college students plan and write more cohesive papers when they generate ideas from their reading, categorize and illustrate them in a graphic picture that I call a map, and then share and discuss the information in their maps with peers." (pg 542) Using an approach similar to Davidson, but exposing her students to several different kinds of map structures, Miccinati teaches her students to use visualizations of what they have read.

She then goes a step beyond Holley and Davidson and introduces the students to map usage as an aid to composition. "When my students compose using a number of academic sources, information from individual maps is synthesized into a final prewriting map. After it is discussed with peers, the initial draft is written." (pg 550) These "prewriting maps" are similar in nature to the

"cluster" Rico discusses in *WRITING THE NATURAL WAY*, in that both operate as aids to invention and records of compositional thought. Like Holley, Miccinati is convinced that the maps are effective. She writes, "As a result, students write more cohesive papers. They no longer randomly paraphrase, quote sentences, or plagiarize, hoping that they have caught the jist of the original source. Thus, mapping focuses students' thinking and serves as an active preplaning procedure, a road map for writing academic papers." (pg 550)²⁴

As further proof of the efficacy of her approach, and perhaps with reverberations of Linn and Daly, she points to an attitude survey given to the students at the end of her class. "On the attitude survey 92% of the students agreed that mapping could be used all through college, 83% disagreed with the notion that mapping could only be used in a writing class, and 92% disagreed that mapping was no better than simply rereading." (pg 545) It may be that students feel better about a class when they believe they have a better understanding of how they are being evaluated.²⁵ It may be that they feel more comfortable when they "know what they know" in the words of one student.

24. Of course this is just Miccinati's reaction to what she saw in her classroom and may not have many implications beyond her specific expereince. However, in the larger context of bringing teacher and student expectations together, it is important to note that Miccinati believes her students are doing better. In some cases, the classroom being one of them, belief may play a role in creating reality.

Classes that deal primarily in abstract notions such as "style," "cohesion" and "unity" may make students uncomfortable because they can not see those elements of an essay in the same way as they see spelling mistakes for instance. Spatial visualization may help the students to relax because it enlarges their vision into areas that were previously invisible.

In a monograph titled "Mapping The Writing Journey" authors Marilyn Buckley and Owen Boyle synthesize and expand the work of Davidson and Miccinati, among others. "Students do not write writing, they write ideas," they say, and therefore, "The greater the quantity and diversity of ideas that students can choose from, the better. Before students can decide upon a thesis statement and select a particular audience, they need to bring to the surface of their memories all ideas associated with the topic." (pg 2) Mirroring the methods of Davidson and Miccinati and with reverberations of the work of Linn, Daly, Flower and Dauite, they describe a method of teaching writing that encourages free thinking among students, while providing them with the means to control and record the results. Like Linn, they stress the need to encourage students and recognize the central role played by the teacher. "At first students need

25. Of course cynics would say that this survey indicates 92% of the students thought they could improve their grade by agreeing with what they thought the teacher wanted. While Miccinati's optimism may be suspect, as with most other things in life, the truth is probably somewhere in the middle, which is still a significant response.

encouragement to have confidence that they know a lot about the topic....," (pg 2) they write. Buckley and Boyle also realize the necessity of recording the information that confidence, once recognized, will generate. "Any classroom of students can produce an overflowing list of ideas. But just as students could not carry dozens of books without dropping all of them, they cannot mentally carry dozens of ideas." (pg 3)

Mapping is their bookbag, but it has value that goes beyond merely being a repository for ideas. "Being able to see at a glance how her writing will develop, and conclude enables the student to visualize the whole with all its related parts." (pg 4) As Flower pointed out, writers set goals for themselves. Instead of sending them back to the original assignment to read and reread, searching for an answer that is not there, the ability to see the direction of the essay at all times may make them more proficient decision makers. As Buckley and Boyle say, "Readily visible are the students' decisions...The map, a graphic, schematic arrangement of ideas, can be shared with other students in the writing group, providing the opportunity for the authors to explicate their proposed plans...a map is visual, one can easily see the development of ideas; the ideas flow from main, or primary ideas to secondary which in turn branch out into tertiary ideas and so forth; each idea has a place and is related to and interrelated with the

whole. Each map is unique, shaped and structured by its author." (pg 4)

The maps may help the writer to control the internal processes that go into composition because they allow him or her the luxury of time. The pace of composition could be altered to suit the writer. No longer would it be necessary for everything to be done in a very short period of time. Reaction could give way to response. In addition, because each map is the unique product of one person, it would make the writer the center of the meaning process, the metaphorical process, written about so many times in different terms by authors from Black to Verbrugge; Berthoff to Turbayne. Spatial visualization may mean writers are free to organize ideas in ways that have personal meaning for them, rather than being forced to fit their ideas into external, often imposed, structures.

Reflecting the work of Dilworth, Buckley and Boyle point out that "To map is to engage in a thinking process..." (pg 4) They take the implications of Dilworth's study a step further and classify the types of thinking that occur during the mapping process. They refer to the symbolic representation of the map as "presentation, or non language expression" and the use of language in the mapping activity as "discursive, or language expression." (pg 4-5) This synthetic aspect of map making has reverberations of writers such as Rico and other right brain, left brain investigators. As a meaning making activity, mapping speaks

to the roots of our natures as communicating beings. Paraphrasing Langer in PHILOSOPHY IN A NEW KEY the authors point out that "...our most primary instincts direct us to make meaning through symbolism. Our natural, innate propensity to symbolize provokes us to dance for joy and for rain; to decorate walls, caves and clay water jugs; to design skyscrapers and coats of arms; to weave blankets and baskets; to compose etudes, symphonies and rock songs; and to write epics, love sonnets, essays and stories." (pg 5)

Mapping is a building activity both from a structural viewpoint, as in the construction of language in a particular form, such as the essay, and as an aid to making a total statement that has individual meaning apart from what has been written by others. "In mapping students can be the thoughtful architects of their own intellectual blueprints." (pg 5)

Buckley and Boyle see mapping as producing a different mode of thinking altogether which they call visual. As opposed to what they refer to as verbal thinking practiced in traditional classrooms, using visual thinking "...the student can see, for example, the whole as well as all its parts as one perceptual unit of thought. Apprehending the whole, or the gestalt, contrasts with verbal intelligence, which is lineal." (pg 6)

The ability to increase the size, or frames, surrounding a unit of thought has implications for the use of short term memory, found to be a central concern by people like Daiute. The ability to move between

modes of thought and the flexibility that engenders has implications for the use of chaos, found to be an important element in the composition stage by Berthoff. The structured presentation of information maps allow makes the writer more in control of the process and more aware of the individual elements of the thought he or she is trying to convey. Many authors, most notably Ortony and Verbrugge, have made mention of how the presentation of information in recognizable patterns makes recall easier. As Bruner says in THE PROCESS OF EDUCATION, "Perhaps the most basic thing that can be said about human memory after a century of research, is that unless detail is placed in a structured pattern, it is easily forgotten." (pg 116) Mapping puts the details in a visual structure. As Buckley and Boyle say, "In mapping, the mnemonic power of the visual is reinforced by the verbal labels signaling each category." (pg 6)

To illustrate their point, Buckley and Boyle describe mapping activities similar to Miccinati's, but with several different types of writing, and several different ages of students. These results were similar to those of Miccinati, and Davidson. "In Summary a process called mapping is an agreeable way to encourage students to organize their thinking. This graphic scheme-mapping-is both visual and verbal and hence has all the advantages of those two symbolic modes; the presentational and the discursive." (pg 7)

SUMMARY

The intent of this review has been to show that metaphor is a central player in the language process and spatial visualization is an effective metaphorical device. In the composition classroom that means metaphor has a large part in the success or failure of learning. It means that the writer, not the written, is the center of activity.

Spatial visualization, as a category of metaphor increases the chances of success because it allows students to "see" elements of the meaning making process previously invisible to them; it gives them control over these elements; and it provides them with a record of the process they must command if they are to produce written works. This threefold situation has several immediate effects on the classroom climate. It places the teacher and student in a cooperative, rather than an adversarial mode because the students see themselves as participants in learning rather than empty vessels awaiting a knowledge dump; it gives them skills they can see as relevant, and that they can take out of the classroom with them for use in other areas of their academic and personal lives; and it provides them with a record of their growth, which is a great aid to confidence because they "know what they know" rather than having to put up with a classroom climate of doubt about what they can, or cannot do, and fear that the teacher will find out the latter and grade them down for it.

CHAPTER TWO: METHODS

INTRODUCTION

The intent of this study is descriptive, in that it seeks first to reveal rather than measure. What it seeks to reveal is the relationship between the writers and the various spatial visualization techniques I have classified under the general term maps. The principal questions of this study then, will revolve around the three central issues: First of all, will writers make use of maps? Second, if they do, how do writers utilize these techniques during the composing, and later, revising processes? And third, what effect, if any does the application of the techniques have on the writers who use them, and on their perceptions of the documents produced?²⁶

Rather than begin with a formal hypothesis that is then demonstrated only in empirical terms, this study begins with an attitude informed by some guiding principles outlined in the above questions. It seeks to explore a relationship openly and as far as possible, without preconceptions. As Mohr and Maclean write in *WORKING TOGETHER: A GUIDE FOR TEACHER RESEARCHERS*, "What teachers have to add to educational research is the sorely missed context of the

26. Of course these aren't the only questions that will be discussed. Actually, at this writing, some of the questions may not have presented themselves to me. As several authors will comment later, an investigation of this type walks a fine line between letting identified questions limit the investigation, and refusing to let questions provide a context for the study.

classroom. Therefore, the most common kind of research teachers conduct is qualitative, hypothesis-raising, and descriptive. Teachers have been participant observers, to use the ethnographic term, for years."(pg.4-5) The value of these studies, mine included, comes in what they initiate, rather than what they conclude.

I have divided this chapter into three sections. The first, "General Principles," summarizes pertinent research elaborated in the previous chapter and connects it with the pilot study I conducted as a prelude to the major exploration. In this section I review the issues generated by previous research; discuss their impact on the pilot study; and show that, even though what the literature details as significant is sometimes complimentary, and sometimes divergent from my observations, both views are indicative of important areas in the study of spatial visualization techniques.

I will discuss some of the work done by the Bay Area Writing Project as it relates to my own work, and finally, I will attempt to bring together previous research with new avenues opened in the pilot study in order to incorporate them into the goals of the major study. In the second section, "The Study," I discuss the processes by which data is most often collected in these types of studies, describe the basis for adapted ethnographic style research in the classroom, and formulate some suggestions for overcoming problems that I encountered during the pilot study.

Finally, in the last section, "The Data," I explore means by which similarities and divergences can be discovered and analyzed in the collected information.

It is the collection of information that will provide the foundation from which I build my observations and discover what implications my study has for the composition process. In this type of study information comes primarily from the students. I have attempted to open as many different channels of communication with the students as possible in the hopes of collecting the largest quantity of information I can. I will collect and classify, by topic, all open student journals and informal writings. This will allow me to see what the priorities of the class are from the students' perspectives, an important step considering the discovering nature of this study. In the pilot study, this particular phase of data collection resulted in 109 pages of student writing in 15 recognizable categories. In addition to collecting and classifying these writings I will make an attempt to prioritize them according to the quantity of references to a particular subject. In the pilot study, for instance, I found that 22% of the comments students made had something to do with the clustering exercises. The discussion of what those comments represent, and their implications will, of course, require further analysis.

I will analyze only informal writing assignments in which a topic was not assigned to determine if there is any consistency of topics discussed by the students when they

are not given a specific assignment. These types of writing assignments allow the students to identify what they see as important in the class.

Of course I am interested in more than just the students' overall response to the class. My study is about spatial visualizations and to collect data on those techniques I will use directed writing exercises, interviews, both formal and informal, discussions and protocols. I will direct my attention to each phase of mapping from cluster through writer's map and reader's map and, using a combination of the aforementioned collection techniques, describe a picture of the relationship among map, mapper and mapped. After I have developed a context for further description from the collection of students' focused writings on a particular phase, I will focus on a particular student's experience as an example, and explore in more detail the experience undergone by that student. In the pilot study for instance, I collected 23 pages of writings on clustering which, using a process similar to the one I use to quantify and prioritize the general writings, I organized into categories. I then selected one student and watched, listened and recorded as she went through the clustering process. Through follow up interviews, informal discussions and more focused writings I recorded her experience in particular. I will repeat this method again with the more hierarchical writer's maps and with the maps done by the reader.

In addition to the hand drawn maps, I will also explore two computerized mapping programs called Writer's Helper Stage-II and ThinkTank. My approach to these computer softwares is to view them as electronic spatial visualizations, and, as such, my method of dealing with them will repeat the one I used with the paper and pencil maps.

By collecting and recording the students' general responses to the experience I will be able to build the context in which to discover the specific role spatial visualization plays in the composing process. By this I mean the students participate in the creation of an environment that gives meaning to the techniques they employ. The plan of my study has two immediate goals: one, to discover the boundaries of the composing process as delineated by the students themselves, and second, to determine the route that spatial visualization takes through the universe of discourse in this particular class.

This may appear, at times to be an eclectic collection, but in actuality it is not. In fact, it isn't a collection at all in the traditional sense, but an exposition. Because I have not predetermined all the elements that have value, it may appear that anything goes. The truth is that those decisions are going to be made in large part by the students and recorded by me. These are very precise and clear-cut decisions that will show themselves in both the quantity and quality of student responses to the experience they are undergoing. On the general, global level the students will

build the scaffolding to contain the meaning they develop throughout the study. On the focused, local level I will be able to watch the students adapt spatial visualization techniques to fit (or not fit) within the meaning construct they have built. In the pilot study, for example, I observed both levels of students responses. On the global level, open journals contained many entries about the new relationships the students were discovering, both personal and in their views on writing. On the local level, students were eager to write and talk about their use of clustering as an aid to invention.

In the early, brainstorming stages of the composition process, students are taught to gain control of their topic by giving up control. We encourage them to "turn off the editor in their heads" and let the ideas flow, then begin to shape those ideas. Participant/Observer studies in general, and this study in particular, start with that same technique. Yet, as a teacher/researcher I must also be in tune with the structure provided by scientific method, the scientific attitude, just as the empirical researcher, who often has the structure of predetermined theory to fall back on and measure against, because, once the initial stage of the research has passed, I must be just as rigorous in my pursuit of the truth as those who study composition in more traditional ways. The quality of the pursuit differs, just as the quality of the ride a rodeo rider takes on a wild bronco differs from that taken by a rancher who hitches up a

favorite mare to the buggy and drives the family into town on Sunday to hear their preacher read the Bible. Both, however, are valid and useful experiences which can contribute to the overall body of knowledge.

My reasons for choosing the participant/observer approach are twofold. First, the distance between any discoveries of this type of research and classroom practices is shorter than with some of the more traditional approaches. The usability of findings from this investigation is one of the foundational underpinnings of this whole project. Second, if the maps have any value at all it will come in their use by students. To discover the aspects of that usage I must go where the students are and watch what they do in natural environments. The clean environment of the laboratory must give way to the dirty environment of the classroom. To borrow a term from the empiricists, it seems my research more closely approximates applied research than pure. I realize that is both a strength and a weakness. A strength because it allows for holistic approaches that come closer to actuality, but a weakness because so many elements impact the composing process that it is difficult at best to determine the effect of just one.

It is not my intention to argue for or against any particular approach. Instead, I prefer to look at the contribution both methods can make as a direction. Empirical research provides horizontal information that can

help adjust our impressions of the quantity of elements in a field of view. Participant/Observer research provides vertical information which can give us an understanding of the nature of specific relationships that make up that horizontal view. One helps us understand forests; one helps us understand trees and how their relationship creates forests. My conclusions in this study will center on the relationship between the students I study, and the experience they have with spatial visualization. It is part of, not separate from, larger and smaller studies that, taken together, advance understanding.

GENERAL PRINCIPLES

As Ray writes in Goswami and Stillman's RECLAIMING THE CLASSROOM: TEACHER RESEARCH AS AN AGENCY FOR CHANGE, "Research is not primarily a process of proving something, but primarily a process of discovery and learning." (pg.14) It is with this quote in mind that I approach my study. However, even the formulation of the most general questions, such as the ones with which I opened this chapter, imply a direction; a setting of priorities. In addition, the research described in the previous chapter, along with the results of my pilot study, casts a searchlight over the terrain of spatial visualization, illuminating some areas, while leaving others dark. The attitude this engenders in the researcher may not be entirely bad however, for as

Macrorie says in the text cited above, "I know that my predilections enter into this search. I think I wouldn't have found such good teachers and such good student work if they hadn't. So I'm pleased I went along with the drift-the common sense of this project-rather than get snarled up in a profitless impossible quest for the absolute objectivity we call 'scientific detachment.'" (pg. 58)²⁷

Macrorie was talking about the development of his book *TWENTY TEACHERS*, a work that had different goals than my study, but his advice has value that goes beyond one project, or one researcher.

The twin searchlights of previous research and my pilot study have illuminated several interesting issues which helped to formulate the initial questions. The relationship of memory and map, investigated by Daiute and Flower has shown up in the pilot study through comments by the participants in their journals and during interviews. As one participant wrote, describing her use of a map during the third assignment of the class, "Map number three was a great help with the guts of my paper last night. I could look at it and know exactly what to write about, or exactly what I wanted to write about." Related to this issue is the

27. Ken Macrorie reacts strongly against what he views as pseudo-science. I include his comment because it makes a valid point, but one that must be taken with a dose of caution. Macrorie will come back to this issue later in the chapter.

idea of control, or ownership, that a writer feels in relation to the work. Boomer says, in Goswami and Stillman's book, "The argument so far goes like this: schools promote different attitudes to knowledge according to success and failure, but even those students who succeed may be alienated from knowledge if they have not learnt how to 'own' their own investigations; if they still believe [that] knowledge resides 'elsewhere.'" (pg. 8)²⁸

The issue of where meaning lives is discussed throughout the literature, and its effects on the students detailed by Linn and Branscomb, among others. Participants in the pilot study also commented on this issue. One student wrote, "I like the techniques of the maps and clusters because details are not required. In high school [the teacher made us do] outlines of our writings before they were written. That technique is time consuming [and] it doesn't really give a picture of how all the ideas fit together, or how they should be placed in the writing. I really never favored outlines." Spatial visualization, for this student, provided the order of outlining, but the

28. Boomer made his comments in a slightly different context, but I include them here because I feel they underlie what the student who wrote "map number three helped me with the guts of my paper," was saying. By allowing students time to reflect over what is often a very hectic process, they become more aware of their own role in the creation of meaning. They begin to see themselves as a player in the game, not just a watcher from the sidelines.

freedom to develop a personally meaningful form, which, he felt, improved his sense of ownership and control over the product. As he says later in the same journal, "The technique of clustering and map making makes the end product much better quality writing."²⁹

A growing sense of control, can lead to a higher level of confidence, another issue discussed in the literature by Linn, and, from the other direction of apprehensiveness, by Daly. Self-assurance was a subject commented upon by participants in the pilot study as well: "I've gained more confidence with my writing skills. My attitude had a lot to do with not wanting to write. At least now I feel like I could actually do a paper for my boss and do a good job at it." The part that the nonlinear nature of spatial visualization plays in the above processes is also an area of interest. Buckley and Bowen commented on it in their monograph for the Bay Area Writing Project as, in a sense, did the student quoted earlier who preferred visualizations to traditional outlines because the maps allowed him to determine how elements fit together.

Of course the areas illuminated by the searchlights of

29. Of course I am not implying that just because the students say it, it is so. They are bound in their reactions and observations by the same predilections, biases and lack of information as the rest of us. I include this student's comments, in fact all the students' comments, because, often perception creates reality in the classroom. Psychologists call this the self fulfilling prophecy, usually with negative connotations. Spatial visualizations may allow me to put that psychological phenomenon to work in a positive sense.

initial experience and previous research are not the only points of interest, nor should they be. Opening questions can provide contexts for further investigations, but should not become controlling limits, especially in a descriptive study. As Macrorie says later in the same essay cited previously, "Searchers must always watch out that they are not sliding into the mindless gathering of information that represents bad science, thinking, looking, and use of time." (pg. 57) In this investigation an issue that sought the researcher rather than the opposite was audience awareness. Time after time, in journal and interview, participants in the pilot study remarked that sharing maps with others made them more aware of how other people create meanings that are different from their own. The following comment, made during an interview by one of the participants in the pilot study, captures the tone of many other responses. "Well, I didn't pay all that much attention to the reader. I had my ideas of what I wanted to present. I found out the reader does not pick up on the same ideas." ³⁰ Audience was an issue that sought its own light, and necessitated the need for flexibility on the part of the investigator. He must be prepared for what John Donne called "emergent occasions," but what others might refer to

30. I mention this because, later in the same interview, the student quoted above said that once he had realized that other people didn't always see things the same way he did, he knew he had to work harder so they could. It appears he was beginning to see that he could control the outcome of the writing process.

as serendipity.

Turning research into a classroom tool is a major theme of this study, so it was with great interest that I read about the work of the Bay Area Writing Project, an organization that is at the forefront of creating a partnership between research and classroom practices. As I read about their methods and results though, I began to wonder about the use of maps as tools of revision. Much had been said about a map as an initiator and a device that frees the writers from some of the less obviously structured aspects of the composing process, but after the glow of initial creation has worn off, it seemed to me that the maps could still be a useful tool. Perhaps student editors could construct maps of the essays they read rather than reverting to a linear checklist of attributes, or being forced to compose a mini-essay in response to the one they had read. I wondered why, once the visual process had been initialized, it was necessary to revert to the old linear activities when finishing out the procedure. With that thought in mind I designed a pilot study that attempted not only to introduce the students to mapping as an invention tool, but to make mapping central to the entire writing process, from first thoughts to final draft. I did this by including the reader as well as the writer in the map making process.

THE STUDY

As Martin says in RECLAIMING THE CLASSROOM: TEACHER RESEARCH AS AN AGENCY FOR CHANGE, "In ethnographic research, there is no hypothesis with a predicted, measurable result. (pg. 21) Mohr and Maclean list eight "characteristics" that promote validity in teacher/researcher type studies. Those characteristics make specific reference to the quantity, frequency, variety and, for the development of later analysis, consistency of the data collected. To insure that I obtain as much data as possible from which to develop my analysis, I kept a research log myself; had the students in the project keep a personal journal, as well as a separate folder containing everything they wrote in the class; conducted interviews with the students; and had some of them do verbal protocols at certain times throughout the term.

Specifically, students in the study were exposed to 21 different writing opportunities throughout the ten week term. These opportunities ranged from informal journals to full blown traditional essays. The five formal essay assignments each contained, in addition to the maps and other material, two rough drafts and a final draft. Informal writing assignments, generally two per week, ranged from free writings to topics assigned by the instructor. All assignments were collected at the end of the term. The

average number of pages in the students' folders at the end of the study was 73.

The course in which my study takes place is the second freshman composition class students at my institution are required to take. The first focuses on grammar, usage, spelling and punctuation using shorter paragraph writings as a vehicle. The second picks up where the first lets off, but uses longer, essay style writings requiring research (I-Search at my institution) as a focus for developing a consistent, clear thought and delivery. Topics, as such, are not assigned, but students are directed to focus their writings into certain areas such as education, or business and develop theses from those subjects. The course is ten weeks long and meets 55 minutes per day, four times a week. At first students write in class, but as the term progresses less writing is done in class and more time is taken up with peer group editing sessions and class discussions. There are only occasional lectures. I did not alter the content or overall objectives of the class, but, instead of the traditional format (at my institution) of peer group, written response to drafts, I taught the students mapping techniques using Davidson's article as a base, first instructing them in ways to map what they had read, then transposing those techniques to what they were about to write, with the addition of clustering borrowed from Rico.

The students range in age from traditional eighteen year olds in their second term of college, to adults in

their forties who are returning to school after as much as 25 years outside of an academic setting. In addition there are transfer students and students who are near graduation, but have put off taking this English course until their last term. In the pilot study for instance, there were 18 students in the class. Since the pilot study was a shakedown cruise of sorts, only four of those students were interviewed. They were a 45 year old adult, a 22 year old, and two 19 year olds. Since the purpose of this study is to collect as much data as possible, in the major study all of the 21 participants were interviewed at least once, two did verbal protocols during the map making process, and one did a protocol exercise as he used the computer.

Because the pilot study was designed to evaluate the overall approach, students in that section were exposed to only two types of maps, Rico's clusters initially, followed by variations on Holley's hierarchical maps. Students were free to design their own hierarchies, or even to utilize a form of their own choosing, which some did, but the maps discussed in class as examples were of the cluster and hierarchical type, more specifically, what Miccinati refers to as the "leaning tree" and "flowchart." (pg. 547) Most students used a variation of these forms. Clusters were used to get started, then hierarchies were used by writers as their drafts developed, and by readers as responses to their readings of fellow students' essays. Instead of filling out a checklist, or composing editor's notes,

student readers mapped the essays of their fellow writers who then compared these maps to the ones they had done.

Students first learned to use Rico's cluster maps as an aid to invention in a dry run class brainstorming session around the question "How would I write a paper about writing?" and later as the initial step of the drafting process in their five assigned essays. The students were shown how to construct clusters and then use them either to free associate with a given topic, or to develop a topic of their own using just the empty form. They were then encouraged to map their own compositional processes using Rico's clusters as a start, then to use the modified hierarchies as they progressed through the process.

Students were introduced to hierarchical mapping through reading excerpts from Davidson's article. They were then allowed to make maps of the essay "All The Years Of Her Life" which Davidson uses as an example.³¹ Through class discussion, modeling, and by mapping three other essays (Martin Luther King's "I Have A Dream," "Teaching as Mountaineering," by Nancy Hill, and "The Road To Rainy Mountain," by N. Scott Momaday) students gained familiarity with this type mapping. In the pilot study students were introduced to only two types of mapping techniques, Rico's clusters and hierarchical types. Another approach to

31. Davidson likes this essay because of its "ambiguity." I agree. Seldom were the maps produced by students so close that discussion was unnecessary, or unlikely.

acquaint students with hierarchical mapping was borrowed from Davidson who first instructed students in how to map the ideas through a process she called the "Group Mapping Activity." In "The Group Mapping Activity for Instruction in Reading and Thinking" she writes, "The Group Mapping Activity actively involves students in the reading-thinking process, as has long been urged by reading authorities who believe that active involvement maximizes students' comprehension of text..." (pg. 218).³² The process involves having the students read and construct a "map or diagram of relationships or ideas, a graphic representation of their interpretations of information in the text or their personal responses to the text based on their personal knowledge of the world. After students have finished reading a passage, the teacher gives them the following instructions: 'Map your perceptions of the passage on a sheet of paper. There is no 'right' way to map. Elements, ideas, or concepts are simply put in diagram form. You might choose to use boxes or circles. You may also wish to draw lines to show relationships. Your map will represent your interpretation or perceptions of information from the passage.'" (pg. 213) The meaning of the map is thus

32. There are, of course, some researchers who don't see such a singular connection between this type of involvement and comprehension. My purpose for using this method comes more from the researchers' views on involvement rather than its result. Admittedly, I have not read every scrap that has been written on this topic, but I have yet to find any hint of support for methods that alienate students from the meaning making process.

created by the maker. This flows from the thought of researchers like Berthoff may start students along the path to recognition that meaning resides within them, rather than externally, a realization that has important consequences as they prepare to compose.

In addition to mapping their own writings, they also used mapping as an editorial device when reading the essays of their fellow students in the peer editing groups. Mapping the course readings was eventually replaced by the use of maps in the composing and revision processes. In the major study, once the students were comfortable with the clusters and modified hierarchies, a period of about one week, they were introduced to a variety of maps using a method borrowed from Miccinati. As she says in 'Mapping The Terrain: Connecting Reading With Academic Writing,' "I find that students transfer reading skills to mapping more quickly and easily if they were allowed to choose between several possible formats and adapt them to their own purposes. In the beginning, they often select a topic or linear map because they are comfortable with it. They can transfer their outlining skills to this graphic picture. As they gain more confidence with mapping, they are encouraged to illustrate the text structure to show the author's organizational plan more clearly."³³ (pg. 546) The types of

33. The transfer of reading skills may not be as simple as Miccinati suggests, but that is not the point here. I introduce these variations to increase my students' options when map making. I am simply trying to increase their non-linear vocabulary.

maps students in the major study were introduced to first were variations of hierarchies such as the topic or linear maps, advanced flowcharts and leaning trees. Later they practiced cognitive maps (which are a combination of clusters and hierarchies), static and dynamic frame maps, iconographic maps and the softwares ThinkTank and Writer's Helper Stage II. Students were encouraged to experiment, but not required to, and understood they were always free to design their own map if they wished. As well as class discussion and exercises to help students understand how the different maps functioned, I also modeled each map type using a sample of my own composition.

A typical unit started with a clustering exercise for which I often provided the students with the center word as Rico suggests. This procedure reflects Miccinati, who writes, "When students begin formulating their individual maps, these are shared with peers before the initial writing. They compare how their peer's explanation of the visual display relates to [the assignment]. They decide whether the information in the map is relevant, adequate and correlates with the writing purpose. As a result mapping promotes talking, thinking and responding to the proposed writing." (pg. 549) After initial clustering, the students did a focus writing using the cluster map as the focal point until they had approximately 300 to 500 words, then made a map of their draft. Some students elected to make the map from the cluster, and then write the draft. Once this

section had been completed, the draft was given to a peer reader who made a map of his or her response. This was returned to the author who then compared the original map (or maps) and the reader's map. This point in the process was used as a beginning place for revision.

While the students took to map making easily, even excitedly in some cases, having little trouble constructing a map of what they had read and explaining it to their peers, or of using the clusters or hierarchies to map their own essays, they had some difficulty interpreting the maps of their readers. Often they would check to see that details were listed on the reader's map and pay no attention to the shape of the map and the relationship among the details therein, or they would look for the "major" points and assume any other differences were due to individual reading differences, what they called "different backgrounds." To reduce this problem in the major study I formalized the process by which students learn to interpret the maps of others. My initial thinking had been that they learned how to read maps by participating in the class discussions of the diagrams made of readings in the early part of the course. Since that proved an erroneous assumption, I set aside two class periods to work on the interpretation of reader's map.

The structure for the presentation of my information was adapted from Miccinati, who, borrowing from an article by Brown titled "Learning How To Learn From Reading" in

READER MEETS AUTHOR/BRIDGING THE GAP, by Langer and Burke writes, "Making meaning," Brown (1982, p 29) points out, "involves: (1) clarifying the purposes of reading, (2) identifying the important aspects of a message, (3) focusing attention on the major content rather than the trivia, (4) monitoring ongoing activities to determine whether comprehension is occurring (5) engaging in self questioning, (6) taking corrective action." ³⁴(pg. 551) These six steps provided the framework for the lessons in reading maps that were added to the major study.

Utilizing a short essay early in the course, ("Will Spelling Count," by Jack Conner) I did a modeling exercise explaining how I would use a reader's map of an essay I was writing in response to Conner's views. I showed students how differences in shape, as well as detail information were important and could be used in the decision making process.

Like the logs, interviews and other methods of data collection, this method of using the maps has structure, yet within that structure there is great freedom for individual students to find a personally meaningful area. The drafting process can be repeated as often, or as little as necessary for students to feel comfortable, and they need not commit

34. What we call common sense is often just an awareness of what is obvious in a certain context. I think that is true of these six steps. They form the "what" of the meaning making process; however, it is the "how" that is most important to me. That is where spatial visualizations come into play. If these six steps are the nouns of the meaning making process, spatial visualizations are the verbs. Both are needed to make a sentence.

words to paper until they feel their maps are complete. Because the readers are close at hand, any questions about map interpretation could be dealt with quickly.

When the students in the major study had practice in mapping both essays they read and essays they were writing, the different types of maps were introduced. At the beginning of the third major writing project, the students were given a copy of Ellen Goodman's essay "The Violence is Fake, the Impact is Real" along with the advanced maps of this essay discussed in Miccinati's article. After one class period of discussion, the students attempted a Dynamic Frame map of "High Flying Squirrels and Pedestrian Students," by Liane Ellison Norman. In their own essays, students were encouraged to experiment with the various types of maps, but were always free to choose the format with which they felt most comfortable.

My study comes closest to what is commonly labeled ethnographic, or naturalistic today. Of course, in the anthropological sense it is not a truly ethnographic study because, as Mohr and Maclean point out, "Research that teachers conduct in their own classrooms differs significantly from ethnographical and educational research that is experimental in design. Ethnographers are new to, and separate from the situations they enter." (pg. 55) Or, as Martin writes in RECLAIMING THE CLASSROOM: TEACHER RESEARCH AS AN AGENCY FOR CHANGE, "Anthropologists have said that ethnographic studies need to contain elements of

comparison, one with another, and without such comparisons, generalizations may not be made. In this sense then, many educational case studies are not true ethnographic studies." (pg. 22)

These differences raise the issue of validity in this type of research. Writing in the same text, Berthoff speaks to this issue by questioning the assumption of validity in traditional research. She says, "The social scientists who prepared these guidelines [for valid research] argue this way: basic research is essential to the advancement of learning physics; therefore, basic research is essential to an understanding of education. That analogy is fraudulent because education is not comparable to natural sciences. Why? Because education profoundly and essentially involves language-and language is not a natural process but a symbolic form and a social process, though it's contingent on natural processes."³⁵ (pg. 29)

Berthoff argues for a new definition of validity which produces not end knowledge, but enlightened development, one

35. Berthoff is admittedly partial to ethnographic style research and may be reacting to the second class citizenship it has been given by more traditional language scientists. I include her comments here not as an attack on more traditional, empirically, based forms of research, but because she raises what I feel is a crucial issue. Ethnographic style research is not empirically based and cannot be judged according to those standards. Just as both fiction and non-fiction are true in different senses of the word, so empirical and ethnographic style research are valid in different senses of the word. Berthoff sees the need for ethnographic style research to develop its own standards, and in that regard she is quite correct.

that does not confuse style with content. She seeks to draw theory and practice together in new arrangements. "In my opinion, theory and practice should stand in this same relationship to one another, a dialectical relationship: theory and practice need one another. The way to get them together is to begin with them together." (pg. 30) Traditional forms of basic educational research, while they may contain their own internal validity, do not provide for this synthesis of theory and practice so important to Berthoff's view.

Further, because they neglect context, they become frozen in time as it were, unable to develop as the reality of the classroom develops. "The trouble with behavioral objectives is that they are not meant to be modified by our practice; they control what we do...", (pg. 30) she writes, later in the same passage. Berthoff seeks a new definition of validity based on developing rather than eternal truths.

While the modified ethnographic research done by teacher researchers cannot produce the same type of truth as traditional educational research, it may, as Martin points out, produce "...useful finger posts pointing to discoveries by individual teachers, and they can suggest directions for other teachers to take up; and, given a group of teachers following agreed patterns of observation over a period of time, a true ethnographic study could result." (pg. 22) Mohr and Maclean agree: "Eventually the issue of reliability may be addressed by analyzing collections of teacher

researchers' studies....Through the specific nature of teacher researchers' reports and the personal nature of their interpretations, other teachers and readers see the generalizable 'truths' that can be reliably interpreted as applicable in their classrooms." (pg. 64)³⁶

Mohr and Maclean are convinced that the research log kept by the teacher plays an important role discovering and recording important observations. They write, "As they [teachers] write, they pinpoint the issues that have concerned them most." (pg. 6) My experience reflected Mohr and Maclean's observation. As I read through the log I kept during the pilot study, statements such as "I am quite pleased at how [a student] has bloomed in her editing group. She seems much more confident than earlier in the term," or "I am amazed at how little the students sense of audience has developed, even though this is the second composition class they've taken [at my institution]." These observations reflected information collected by researchers in the studies I was reading, as well as discoveries I made myself. In addition, I found that the investigation suggested its own directions through my journals if I gave myself the proper time to write, read and reflect.

36. This will create some problems for me. A "Finger post" is not what I'm after, yet, these two passages suggest my conclusions may be shackled with qualifiers. On one level that is good advice. There is a danger of going too far, but a signpost indicates a direction, and, because the destination is still over the horizon, certain predictions about where this particular post is pointing are necessary if progress is to be made.

Of course the researcher's log should be more than a description of the author's opinions. Even though the log I kept throughout the pilot study was primarily a reactive one, and I continued that aspect during the major study, I used Graves' suggestions to provide a framework and starting place from which my observations developed. In *WRITING: TEACHERS AND CHILDREN AT WORK*, he says, "Observation doesn't begin with surveying an entire room. A sea of faces brings an ocean of confusion. Start with one child, a child whom you want to know more about. But don't chose the most difficult and perplexing child in the room. Choose a child in the middle range whom you sense gives information and with whom you can easily communicate...The following are types of observations that can be used: Folder Observation: Go over the writing in the child's folder...Distant Observation: Standing on the side of the room, observe the behavior of the child while writing...Close in Observation: Observe how the child goes about composing...Participant Observation: Ask questions of the child in such a way that the child teaches you about information and his composing process..." (pg. 286)

There are two important implications in Graves' advice for the type of study I undertook. The first is that the teacher is an observer, but also a meaningful part of the class. Several writers in *RECLAIMING THE CLASSROOM: TEACHER RESEARCH AS AN AGENCY FOR CHANGE* mentioned that teachers were in an excellent position to do research in the

classroom because of their familiarity with the context in which they worked. By advising the observer to familiarize himself or herself with the student writers by studying their writings, and by paying personal attention to them rather than remaining a scanning camera on the wall, Graves is telling the researcher that he or she must be a part of the observation if any useful data is to be collected.

Graves' advice, given in 1983, is the subject of current discussion by Anthropologists. At the most recent conference of the American Anthropological Association reported in "The Chronicle of Higher Education"(11/30/88) Ellen Coughlin writes, "Anthropologists have come to acknowledge, over the last two decades or more, that the study of culture is inevitably subjective and partisan." (pg. A5) In fact, one researcher felt so comfortable with the contribution the observer makes to the observed, that she included not only her involvement in a study done in the Sinai, but the observations of her husband as well.

The second implication of Graves' suggestions revolves around Dewey's concept of "suspended conclusion." In RECLAIMING THE CLASSROOM, Martin says, "In ethnographic research, there is no hypothesis with a predicted, measurable result." (pg. 21) Graves' exhortation to let the child teach the researcher parallels Martin's thought and reminds the teacher that his or her first priority is to discover, not measure. I found this very helpful advice

when asking myself what my role as a teacher/observer in the class was.³⁷

Just as important as the researcher's log are the student journals, for it is also the students who must make sense, in their own terms, out of what happens in the classroom. Toby Fulwiler, writing in *LANGUAGE CONNECTIONS: WRITING AND READING ACROSS THE CURRICULUM*, classifies student journals into several areas. He says journals can be used for "Summarizing... 'What did you learn in here today?'... Focusing... Writing clears out a little space for the student to interact with the ideas thrown at them and allows them to focus problems while the stimulus is still fresh... Problem Solving. Use journals as a vehicle for posing and solving problems... Homework... Suggest that students respond to questions or ideas that were highlighted in the day's class or ask questions which would prepare them better for the next class... Progress Reports... I often ask students to make informal progress reports to themselves about what they are learning in my class... Class Texts. Ask students to write to each other, informally, about concerns and questions raised in the class." (pgs. 19-24) In the pilot study, I found that students felt a little more comfortable with the more substantial structure Fulwiler's

37. Surprisingly, even though Graves was discussing an elementary writing class in his book, his suggestions required little adaptation to my college classroom. The students were a little more articulate, and the discussions a little more sophisticated, but the problems themselves were very much the same.

suggestions provided. However, just as with my log, enough freedom must be left for the student to react and respond in his or her own fashion as events unfold. In the major study I sometimes gave the students questions around which to write their journal entries, but I made answering the question optional if they had something else about which they would rather write.³⁸

While written forms of data collection are unquestionably important, the fact is that they are written, and learning to write more efficiently, or more easily, is why students are in classes such as the one in which I conducted my investigation. Daly pointed out that students who feel anxious about writing tend to avoid writing situations. Lack of practice with writing, even informal types such as journals, could have an effect on the data a researcher is able to collect. This, coupled with the fact that most students have simply had more practice talking than writing, makes interview and protocol types of data collection important in fulfilling Mohr and Maclean's validity characteristics. Writing in *LEARNING TO WRITE, WRITING TO LEARN* Mayher says, "Conferences will be as various as the number of writers in a class, but they should be conducted in light of what is most pressing for the writer at the moment." (pg. 138) Graves, in *WRITING*:

38. Being students, they often answered the questions I posed. To counter their urge to do what I wanted I made the questions purposely vague, like "What's the lesson for the day?" or "Where are you as a writer?"

TEACHERS AND CHILDREN AT WORK, also has some advice for teachers who must talk with their students about their writing. He says, "Follow the child, let the child talk; let the child understand that what the child knows is primary." (pg. 101)

The best way to collect information is to listen. In a sense, Graves' position encompasses earlier writers who referred to the modified ethnographic study as a way of discovering truths. The attitude implied is one that puts the researcher solidly in the role of observer of natural, rather than manipulated, events. Graves does not suggest that students simply talk, no more than Mohr and Maclean suggested researchers simply fill up pages in their logs. As Graves says, "Children will talk about their subjects. They talk when the conference setting is predictable. They talk when there is a very simple structure to the conference itself. The child knows he is to speak about the topic and the process and that the teacher will help him do this." (pg. 104) As I helped the students with a loose, but identifiable structure for their journals, I must also help them to explore in more depth the process they are undergoing by providing a structure to the interviews. I attempted to do this in the pilot study with general opening questions such as "How is the draft coming?" or "What seems to be working for you this time?" and then, following Graves' advice, tried to be the best listener I could, picking up on what the students identified as a concern or

an important point and trying to get them to pause and explore that thought further.

Rather than an interview in the traditional sense, I tried to have a conversation with the participants of the study regarding their experiences with the maps specifically, and the writing in general. Most interviews consisted of a few prepared questions that were asked each time, and from then on I attempted to draw my questions from what the students identified as important in their discussion. "Listening is hard work...Listening to children is more a deliberate act than a natural one. It isn't easy to put aside personal preferences, anxieties about helping more children, or the glaring mechanical errors that stare from the page. I mumble to myself, 'Shut up, listen, and learn,'" (pg. 100) Graves has written, and my experience fully substantiates his.

Odell, writing in RECLAIMING THE CLASSROOM: TEACHER RESEARCH AS AN AGENCY FOR CHANGE, describes verbal protocols as "One of the most popular methods of examining the composing process...." (pg 150) He does however, offer some cautions. "The disadvantages are (1) not all writers are comfortable composing aloud, and (2) the act of writing is so complex and demanding that a writer may be able to verbalize only a small part of the knowledge and strategies he or she brings to a writing task." (pg. 150) Flower, perhaps the best known practitioner of verbal protocols offers two suggestions for dealing with the difficulties

identified by Odell. In a study titled "A Cognitive Process Theory Of Writing" she says, "Unlike introspective reports, thinking aloud protocols capture a detailed record of what is going on in the writer's mind during the act of composing itself. To collect a protocol, we give writers a problem, such as 'Write an article on your job for the readers of 'Seventeen' magazine,' and then ask them to compose out loud near an unobtrusive tape recorder." (pg. 368)

Like the research logs and the interviews discussed earlier, a key to successful collection of verbal protocols is to provide a context in which the student can work, but which allows for enough freedom to take in individual approaches. In my investigation this structure showed up in the form of statements like "Tell me how you are constructing a map for topic 'X'" or, "Tell me how you are going to turn this map into a rough draft." or "Tell me how you will use this editor's map in your revision." Students were exposed to the protocol process in dry run situations before being asked to actually talk sitting next to a tape recorder.

Reflecting Odell's first concern, in the pilot study the students told me they felt more comfortable in protocol situation if I remained with them. Because I was in the room, protocols often degenerated into conversations as the students would draw me into the process. I was not overly concerned with this situation because the open flow of information was maintained, but it meant that I was not able

to conduct protocol sessions in quite the way Flower defines them.

Flower speaks to Odell's second concern about protocols in a later article titled "The Pregnant Pause: An Inquiry Into The Nature Of Planning." She writes, "If accurately handled, thinking aloud protocols yield enormous amounts of information without significantly changing the focus or content of thought. Giving a protocol is much like talking to oneself while writing. Naturally a verbalization will not capture all the associations, resonance, and richness of a given thought, but it will tell us that such a thought was occurring. More importantly, protocols give us an extraordinarily detailed, blow-by-blow record of a writer's constantly shifting conscious attention, and by capturing the flow of concurrent thought processes, protocols avoid the unreliability of retrospective generalization." (pg. 233) What the protocols lose in the quality of thought they record, they more than make up for in the quantity and in their ability, much like the maps themselves, to freeze for study what is otherwise a very tenuous and short lived moment in the entire writing process. For my purposes they are verbal maps of initial steps which, while they may not explain, at least point in directions that have importance. Coupled with the other forms of data collection they may provide the "finger posts" Martin spoke of earlier that lead to an increase in understanding. Because I do plan to collect many different forms of data, I will not have to

rely very much on any one particular form. For this reason, and because of the discomfort experienced by students in the pilot-study, I plan to use protocols only twice in the section of the study that deals with hand drawn maps, and once in the section that deals with the computer softwares. As with the pilot study, I plan to also be present in the room, and it will not surprise me if what starts as a protocol evolves again into a conversation between the student and me.

THE DATA GATHERED

Even though the pilot study focused on just two types of maps; even though only four students were interviewed and no protocols were attempted, no software studied, it produced a tremendous amount of material. The major study, of course, produced even more. One of the benefits of traditional research, what Britton calls big R research, is that the method of analysis is clear cut. Research of the type attempted here, little r research, is not so fortunate. In a sense once the investigation is over the researcher is left to discover what he or she has discovered.

Odell, writing in *RECLAIMING THE CLASSROOM: TEACHER RESEARCH AS AN AGENCY FOR CHANGE*, lists some areas around which observations, thoughts and reactions circulate that can assist the researcher in developing a framework for the discoveries of the investigation process. He says, "We need to begin with the widest possible range of questions and

then look for recurring themes...We need to examine the assumptions underlying our questions...We need to reformulate our research questions until they give us as much guidance as possible...we also need to decide exactly what our role as teachers will be." ³⁹(pg. 132-133)

Since the major thrust of the study is to discover how writers made use of the maps in the composing process, the student journals, interviews and protocols are the primary sources of data. A careful reading of this material was undertaken using Odell's advice as a guideline. Previous research provided some "recurring themes" such as the map's effect on memory, confidence and control. The need to "reformulate our research questions" was amply demonstrated during the pilot study when the issue of audience arose. The need to "examine the assumptions underlying our questions" was also made clear to me as I tried to explain to myself the reasons for the sudden blossoming of audience awareness. Because I was focused so intently on the maps and their role in the composing process, at first I assumed mapping had something to do with the students' seemingly new found ability to think about the reader. I began to search for an explanation that would blend map making and audience awareness. Then, in a quote attributed to Britton in a chapter on audience awareness in Fulwiler's LANGUAGE CONNECTIONS: WRITING AND READING ACROSS THE CURRICULUM, I

39. Guidance is the key word. I spent much of my time trying to sort out the difference between suggestion and command as I worked through the analysis.

read, "...almost half the student writing is from the pupil to the examiner, with all the pressures and anxieties inherent in such communication. If writing, however, is used for activities in addition to grading, such as journals, and in classes other than English this anxiety may diminish." (pg. 59) Later in the same text Fulwiler says, "...beginning writers...have an incipient understanding of audience, but they are unaware of how to use this knowledge when writing." (pg. 75)

I began to wonder if my initial assumption was oversimplified. I used a considerable amount of writing in my class that was not strictly for grading. I made a conscious effort through the use of modeling, drafting and peer group work to reduce the anxiety level for students. Perhaps what I was seeing in regards to a growing awareness of audience in my students was the result of a complex of forces in which maps may, or may not play a part. As a result, in the major study I included questions on audience awareness in student interviews and opportunities for students to write in their journals about audience in an attempt to collect more data for a better analysis. My reformulation was to put my initial position on hold until the new situation was explored more fully. In addition I learned that it is best not to expect to find only that for which I am looking.

Finally though, some analysis must be attempted. In that regard the research log plays an important role, for it

is the record of small observations throughout the term that, when connected to other data, leads to the larger observations on the meaning of what has occurred. Writing in *WORKING TOGETHER: A GUIDE FOR TEACHER RESEARCHERS*, Mohr and Maclean say, "Observation and reflection are the foundation of the teacher researcher's work in the classroom." (pg. 25) The research log is the record of those observations and reflections. Later in the same text, Mohr and Maclean give a suggestion for the use of these observations: "In analyzing, teacher researchers look for surprises, the unexpected events. As they formulate possible explanations for what they see happening in their classrooms, they apply their understanding to what they see, but when something happens that contradicts their expectations, they struggle to uncover the underlying principle that makes the occurrence of two seemingly contradictory events happen." (pg. 40) The data collected from the students and the data produced by the teacher researcher run an occasionally parallel, occasionally divergent course throughout the study.

In the end it is through careful, reflective, open reading that these streams are brought together into something meaningful. As Mohr and Maclean point out, it is often the areas of divergence that produce the most interesting information. Unfortunately, it is also these areas that produce the most danger of oversimplification or overly narrow analysis. Having, I hope, learned the lesson

taught to me by my original analysis of the students' growing awareness of audience, I used my research log in the major study as a method of identifying the points of similarity between my perceptions and those of the students, and, more importantly in identifying points of departure. Trying to make meaning out of both positions is the point of my analysis, which I now begin.

CHAPTER THREE: DESCRIPTION OF RESULTS

(Environmental)

In this chapter, I present a quantitative description of the writings, interviews and protocols collected during the study. I have subtitled this chapter "environmental" because its purpose is to show the context from which specific comments about spatial visualization techniques developed. In studies of this type, results develop from a synthesis of many elements. Rather than attempting to hold some aspects of the situation in check so others can be more clearly measured, these studies welcome the varied elements of the classroom into the process, attempting to use all material in a movement towards a wholistic understanding. With that thought in mind, this chapter presents a description of the general "universe" of the class in which my study took place.

In chapter one, the importance of context in the generation of understanding was discussed by authors as varied as the psychological experimentalists Verbrugge and Ortony and the English theoretician Richards. The role that this chapter will play builds on their work, becoming a lens, as it were, through which specific aspects of spatial visualization will be brought into focus. In this regard it is as much a part of my study as a verbal protocol of a student developing a cluster. Without it any discussion of my hypothesis, indeed any discussion of spatial

visualization techniques at all, would be unnecessarily truncated and of little use in any realistic sense.

In the next chapter I continue the description by focusing on the five formal essay assignments given throughout the term. In this section I will describe how the maps themselves played a role in the invention and revision stages of composition. Where appropriate, I will use quotations from student journals, interviews and protocols to illustrate important points. In addition, I will include a section on "Computers and Composition" in which I describe two students' experiences with selected compositional softwares. My approach to these softwares is to view them as electronic spatial visualizations and discuss the implications they provide in those terms.

In EIGHT APPROACHES TO TEACHING COMPOSITION, edited by Timothy Donovan and Ben McClelland, Donald Murray wrote, "...a key problem in discussing-or teaching-the writing process is that in order to analyze the process, we must give unnatural priority to one element of an explosion of elements in simultaneous action and reaction. Meaning is made through a series of almost instantaneous interactions. To study those interactions within ourselves, other writers, or our students, we must stop time (and therefore the process) and examine single elements of the writing process in unnatural isolation. The danger is we never recombine the elements. Some teachers present each part of the writing process to their students in a prescriptive

sequential order, creating a new kind of terrifying rhetoric which 'teaches' well, but 'learns' poorly." (pg.4)

In order to discover what has been learned rather than what has been taught, I begin my description by looking at the students' informal writings. I believe that a study of students' journals, coupled with information from interviews, will describe the "universe" from the students' viewpoints. It will open a window on what is being learned. All in all, I classified 137 pages of student journals from which I named ten categories as follows: Reader, Revision, Invention, Control, Organization, Confidence, Groups, Meaning, Maps and Other. In most cases I was able to let the categories name themselves through the journals. In the category Reader, for example, the students spoke specifically to and about the person they addressed in their writings. In other categories, Invention for instance, I chose the term which I felt captured the idea of the students' writings, even though they used many different terms to describe the discovery of a topic and the first steps towards an essay. The category Other contains a wide variety of comments that resisted categorization in any consistent sense. For example, this category contains comments by students on the role writing played in their previous classes, or the role they see it playing (or not playing) in their future careers. A business major wrote that he still was not completely convinced that if he could

hire an accountant to do his books, he could not hire a secretary to do his writing.

Graphically, the relationship among the various categories of students comments appears in Figure 1:

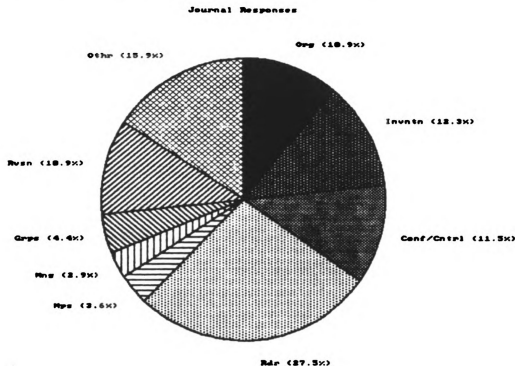


Figure 1

Some of the categories relate specifically to my study of spatial visualization techniques, some do not, but I include them all in order to give as clear and as broad a description of what happened in this class as possible. Assignments that had specific subjects were not included in the journals and other writings used for categorization. The writings I classified were of spontaneous subjects totally at the students' discretion.

This approach is necessary because, in order to bring the varied aspects of the writing process into focus, I must approach the class from the students' perspectives. They are, after all, the participants in this participant/observer relationship, so what they have to report about the experience will be the ground from which I can explain the specific role of spatial visualization techniques. Even though I chose the category names for the types of comments made by students in their journals and other informal writings, I took the advice of Odell, among others, as I read through these documents, and tried to let the writings suggest the categories. Often the students would use certain words or phrases over and over, such as "reader," or "confidence." As I saw these patterns developing I named categories for them. When I gave the category a name myself, such as "revision," it was because students talked about the drafting process in many different ways. I simply chose the rubric under which to collect their responses.

I made no distinction between a student who mentioned an idea in passing and one who used the journal to discuss the same idea in more detail. Both received one mark in the respective category. After the categories were set and I began to look more closely at the writings within each section, I found that students took advantage of the opportunity provided by the journals to explore a topic in some detail. In view of this finding I subdivided several

of the categories even further, based on the nature of the issues raised. This is most obvious in the category labeled "Reader." I did not overlap categories; however, in a few instances I had to make a decision as to what category a particular piece of writing belonged. It appeared to be difficult for some students to separate aspects of the process enough to write about them in isolation. I attribute this to the fuzziness of distinctions between the stages in the prewriting, writing, revision process, as well as its progressive recursive nature.⁴⁰

By far the largest group of comments, almost 30%, made some sort of reference to the reader, or audience. The comments ranged from surprise and discovery to disgust that this person, or persons "Couldn't get the point." In fact, the range of discussion about readers, and their effect on the work, led me to subdivide this category into four parts.

THE READER SPEAKS

Students writing in the first subcategory described the often shocking discovery that there is indeed a reader out there. There were over 37 pages of student writings on the subject of readers and fully half of them discussed the discovery, and growing awareness of the existence of the reader. One student wrote, "Before this class, I didn't pay much attention to the reader." My own log records several instances in which the surprise the students felt upon

⁴⁰. Faigley, among others, comments on this fuzziness in more detail and, at one point, asks where does revision begin?

discovering a reader caught me off guard. "How can [a student] come through basic English, English I and into this class without realizing that people read her papers?" I wondered at one point. Several writers in Goswami and Stillman's book warned that this type of study may raise as many questions as it answers. My experience with this student may be an example of that phenomenon.⁴¹

THE COMPLICATION OF READERS

From this subcategory grew the second, which was built around the question of what to do with the reader. Having made the discovery that readers exist, the students were able to see the importance of their role in the process. One student wrote, "My reader's response lets me know if I am getting across what I really want. Their ideas allow me to put a perspective on my paper and let me realize the changes that I need that I could not figure out myself."

41. More than two thirds of the entries in this category were by students who considered themselves "weak" writers. These were students who wrote about how "hard" writing was for them and how they "avoided" it whenever possible. One student told me she would rather pay her \$60 a month phone bill than write letters to her boyfriend who was stationed in Texas because she just did not like "having to do all the explaining" that writing required. "It's easier to talk," she said. As I became more familiar with these students' writing styles over the space of the term, I discovered that the majority of them could convey their thoughts in writing with an acceptable degree of clarity. Some did have difficulty expressing themselves in writing. Almost all of them said they had little previous experience dealing with the responses of the reader. According to these students, their high school writings had been most often read by the instructor only, and graded with primarily a mechanical format. This particular information is not part of my analysis. I include it as an adjunct to the regular narrative in an attempt to give as broad and as clear a picture of the participants as possible.

Or, as another student put it, "If I didn't listen to what they [readers] had to say, my papers would be full of bull." The students came up with comments such as these on their own. It is true that a portion of the time was set aside to learn to use the maps readers create, which may have drawn more than a normal share of the students' attention to this aspect of the writing transaction, but no extra emphasis was focused on the reader him, or herself. In fact, I tried to create an atmosphere in which readers were treated as a natural part of the compositional equation.

Since my class was composed of students who were business majors of one sort or another, I developed the analogy of reader as customer. What discussions we had of the role and needs of the reader were couched in business terms and the students were encouraged to think of the transaction between writer and reader in that fashion. It was my hope that by using more familiar business terminology I could make the reader a common element. I consciously tried to maintain this atmosphere, even with students who were discovering readers for, what seemed to them, the first time.

There were writers in this second subsection, however, who were not able to adapt as quickly. "It is very easy for me to write a paper, but when someone else reads what I have written, they don't understand it," lamented one writer. After what must have been a particularly brutal group

session, another student wrote, "I continue to have the problem of making the maps one day designed for a certain idea, and come to class the next and have the idea broadsided and have to careen off in another direction." In spite of fuming such as this though, the students seemed to accept the inevitability of the reader. Later in the term the same student quoted above wrote a journal on the lessons he was learning. "Another little lesson was to write for the reader. That is the goal for the writer." Even though it appears this writer still has not made his peace with readers, he has come to the conclusion that there is a "little lesson" to be learned from them.

THE READER'S RESPONSE

The third subsection is one in which students deal with the reader's map. As part of the study, peer editors would map the essays they read, rather than filling out editing sheets. Entries that centered around reader maps were concerned with the role they played during the drafting process. Because these comments relate directly to the study I was conducting, I was very careful about the criteria used in this category. I looked for comments that directly associated the reader and the maps. The comments students made about this subject circled around three centers.

First, writers saw the maps as a symbol of their growing awareness of the reader's existence. Two entries from the class journals illustrate this point: "This

process [readers making maps] lets the author of the papers be more aware of the reader," wrote one student. Another was more direct. "The first maps allowed for the readers to communicate with the writers. This gave the writer a chance to see if he/she was communicating their opinions in the way that he/she wants."

The aspects of that communication was the second center around which comments gathered. Entries such as, "The reader map is the most helpful and useful one to use, because it outlines the major points in my paper. The map helps me to see what points and facts the reader thinks are most important," are the types of comments students made in this subcategory.

Students whose writing was placed in this category chose their topics independently but, a great deal of class discussion centered around the maps, specifically the readers' maps. I wrote earlier about the difficulty I experienced in the pilot study in getting the writers to make good use of the readers' maps. To overcome that difficulty in the major study I formalized the process by which we dealt with these maps and included some specific practice. Whether the students are reacting to the voice of the reader through the maps, or whether they are simply more aware of the maps because I made them more aware, is an open question in my mind.

Even with the higher profile reader maps received in my class, it is hard to imagine, given the quantity of

responses, that they did not play some sort of role in developing the writer's awareness. Because they are visible records, maps may provide an anchor when readers stir up the compositional sea. Because they were permanent, maps could provide a foundation from which my students could develop a sense of history about their work. This sense can enable them to build a larger context in which to hold their thoughts and the thoughts of others. A larger structure could make it easier to fit new information into the system, rather than having to deal with so many sources of input in isolation. A larger structure, in turn, may help to reduce the unknown. Authors from Piaget to Flower have commented on the need for these cognitive structures in the learning process.

The final topic around which student comments centered was the role the reader played in helping the writer to recognize what he or she wanted to write. Students writing on this issue described the reader as a source of insight, often a catalyst for the author. "I felt this [reader's map] to be very helpful because it gave me more ideas that I hadn't thought about," is one example. Another student wrote, "I really enjoy listening to everyone else's ideas. It gives me a better outlook, broadens my thoughts and ideas and [gives me] better ways to apply it to my writing." These students, and the others whose comments are similar, appear to believe that the reader can be a positive force in the composition process. Words like "helpful" and phrases

like "broadens my thoughts" were used not only by the two students quoted here, but by almost all of the other writers who made comments about this subject as well.⁴²

I have set these comments in their own section, rather than including them with the larger section on writer/reader communication because students mentioned this particular role of the reader specifically. It seemed important to them to differentiate a response from a suggestion. It seems the students were not just reacting to the reader, but are incorporating that input into their goals. These students, despite their occasional grumbling, appear to be taking the reader as a partner in the writing transaction. The differentiation of reader comments into responsive and suggestive by the students is particularly noteworthy because I did not discuss the role of the reader as a source of ideas. In class we often talked about the way some writers write

⁴². Two students never did seem to accept the reader as a helpful force. One wrote, "I sometimes feel uncomfortable about someone reading what I wrote, or what they might think of me." The second student's comments were in the same vein. These two students were not as concerned with the writing itself as they were with the judgment the reader would make of it. I was never able to get them to separate response to the piece from judgment of the writer. Both admitted to keeping diaries on their own, at one time or another, and both at least tolerated writing and paid lip service to its importance. It seems that even though I intended the methods I used to be easy for all students to learn, my procedures still made some assumptions about the type of person using them. These two students apparently were never able to convince themselves that readers were not always judges, so for them, the spatial visualizations, in fact the whole theory of the class, appeared to me to be stress building instead of stress reducing.

their way to a topic, and the students even read excerpts from Elbow and Brande on this topic, but the identification of the reader as a source of information is totally a student discovery. The experience these students have undergone may be similar to that described by Petrie in chapter one when, using Piaget's terms assimilation and accommodation, he discussed the procedure by which sense is made on new information.

THE READER'S GIFT

The last subcategory under Reader was one in which the students wrote about how they felt more confident as a result of getting reader response to their work. "I feel confident in what I write when I see other people's view of it," is a student comment that provides an interesting counterpoint to the students who saw the reader as a complication. Another is, "After the reader has read the author's papers, they...let the author know what they had gotten out of the paper. After a second draft is created, the reader...lets the author know if he has made the necessary changes for the final draft." This is a further example of the students learning to develop a dialogue with the reader. Confidence for one student comes from "seeing other people's view" of the work. For the other, the reader "lets the author know if he has made the necessary changes." This student appears to be approaching some sort of partnership with the reader. Other journals in this section are filled with similar comments.

I got a sense from reading what the students had written, and talking to them, that, even though the reader complicated their lives on occasion, overall they were grateful for the input. Authors from Aristotle to Elbow have written about the unknown, often mystical nature of elements of the writing process. My own experience as a composition instructor and writer has reflected those authors' views. As Hemingway pointed out, writing is a very lonely job at times, and it seems that while they may be at first frightened, confused, or angry, eventually these students appeared to welcome another voice in the wilderness of ideas. As the term progressed, I discovered that the students who expressed surprise upon discovery of the reader had been intellectually aware that other human beings read their writing, but, until the mapping exercises, seldom had occasion to communicate with them on any meaningful level. The reader, for these students, was some unknown other, or the teacher who graded the essay after it was done, and that was the end of it. The surprise they felt may have stemmed from their opportunity to have a conversation with the reader as the writing developed.

That conversation played a role in turning writers' belief in themselves to knowledge. All my students thought they could communicate in writing, but because of their limited experience with the written word, they seemed, at some level, unsure. Even students who expressed a good deal of confidence in their abilities felt the reader was,

essentially, helpful. Perhaps this accounts for the fact that the entries that saw the reader as a complication were done earlier in the term than those that saw the reader as a confidence builder. Early hostile reactions may have given way to acceptance and finally to appreciation as the term progressed and my students saw that they could, in practice, communicate in writing to their fellow students.

Toby Fulwiler, among others, has written about the complex nature of events that leads to an awakening of audience awareness in student writers. Fulwiler's comments suggest that ascribing the degree of interest the study group showed in the reader to the impact of spatial visualization techniques would be an oversimplification at best. While the bulk of student comments centered around the appearance of the reader and the problems he or she caused, when students wrote about the maps and the readers together, they wrote about how maps were useful in establishing lines of communication. Regardless of how a student comes to a realization that the reader has a part to play in the writing transaction, the next step is to develop a procedure for dealing with the new element. Maps may be one way of completing that step. When readers make maps of the writers' drafts they are providing a visualization of their response. My students seemed to realize this when they wrote about the helpfulness of the maps in determining how the essay was being received.⁴³

The issue of permanency was raised by several authors in chapter one, most notably those describing a psycholinguistic approach to writing. Short term memory, its limits and uses were important topics to these writers. Flower and Daiute, among others, pointed out the way in which the demands placed on short term memory can impact the results students achieve during the composing process, even down to the level of individual sentence construction. My own log records many instances of students discussing their maps with each other. It seems that the permanent and visual nature of the maps provided both a relief to the demands placed on memory, and a record of events that could be used as a starting place for further discussion.

The maps drawn by readers began a process of interaction between reader and writer even though I originally considered them to be a tool used primarily by the writer. These visualizations appear to in some way have codified the lines of communication between writer and reader, and given them a common language with which to carry on what the maps began. By common language I do not necessarily mean words alone. The map's shape and construction was like a Rosetta stone, providing a source of

43. I do not mean to imply that mapping is the only effective technique in any of the areas I will discuss, nor that it is the best. A casual glance through any of the journals that deal with writing will show that there are many effective techniques and approaches to the various elements of the writing process.

common meanings between reader and writer. There was far more discussion between reader and writer about these maps than I had anticipated. This may show that the students saw, and were able to make use of, the clarifying function maps performed.

THE PROCESS IS INITIATED

I labeled the next category Invention because I felt the rhetorical term was the best suited to cover the group. There were 17 pages of student entries in this category which comprised about 12% of all comments, and each of them had something to say about the role clusters played in helping get started. Every selection contained words like "cluster," or the more generic, "map" used in a way that made it clear cluster was what the writer was describing. In addition there were other key words like "start," "begin," "first," and the like. Each entry in this section directly links two or more of those key words.

One student wrote, "First there are the clusters. When I am given an assignment I will be able to put the main topic on a piece of paper and come up with the priorities of what should be said in the paper. This method allows me to get my ideas down on paper without a bunch of sentences that relate to nothing." I asked this student in an interview what she meant by "priorities" and she said "details." I asked her if it was important to get the details in a particular order and she said, "not right away." She liked the clusters because they were economical in that she did

not have to write in complete sentences, and they allowed her to "see" the elements that would make up her paper. The economy of this visualization technique may be analogous to the economy of metaphor discussed by Richards in chapter one.

The ability to use the clusters to predict the shape writing would take was cited by the students as a positive outcome of this phase. "It [clustering] has continued to help me to build some kind of outline so that I know what I am going to talk about in my essay," and "The first step of writing the paper is the cluster stage. In this stage, the writer writes whatever comes to mind about the topic. These subtopics later turn into the body of the paper," are two examples of student thoughts on clusters. For these writers, the cluster appears to provide the freedom necessary to make discoveries about their topic. They help one student "know what [she] is going to talk about," and provide the other with the means to "write whatever comes to mind." Although I have only cited these two students, their comments are repeated again and again throughout the entries in this area.

In journals, interviews and casual conversations students voiced their approval of clustering technique. Indeed, it was the most accepted element of the entire study. Even students who were reluctant to use the more formal hierarchical maps took to clusters with enthusiasm. In conversations, and in their journals, students indicated

to me that the reason they liked it was because it took the pressure off. It allowed them to brainstorm on paper without regard for sentences, spelling, organization and so on. It appeared to me that clustering allowed them to think without worrying about the end result of thinking, and they could have a record of that thinking to refer to whenever they felt the need. This seemed to be a very liberating revelation for the students. My notes describe one student as appearing to "suddenly awaken" as she went through a clustering exercise. This was a student who did not like writing and made no secret about it. My notes later in the term show her once again becoming difficult to motivate, but she never lost her enthusiasm for clustering. I asked her once to give me a quick definition of writing and her response was "When I think of writing I think of spelling." She was continually concerned about the aspects of writing Smith refers to as transcription, and she was never comfortable discussing her work with others. She often referred to the group sessions as "a waste of time" and much preferred getting on with the business of turning in a grammatically correct essay with thesis statement underlined (I did not ask her to do that). The fact that she enjoyed the clustering exercises as much as she did may be indicative of the amount of pressure the transcribing elements of writing put on her.

Perhaps if she had been able to abandon her demons throughout the drafting process as easily as she did during

clustering, the course may have been more worthwhile for her. I believe the clusters were significant for her though, because they may have helped to create a distinction in her mind. Spatial visualization techniques in general, and clusters in particular, are intended as tools, and a tool's value comes in its constant and consistent use. Use has to begin somewhere. Haltingly perhaps, I may have seen the initial stages of that use in this student.

Caution is necessary though. For most students, clustering was a new undertaking and the novelty of the activity probably had some part to play in its appearance in the pages of student journals. Still, entries about clusters are noteworthy because whenever a student chose to write about clusters he or she did it in terms of how that particular type of spatial visualization made the composing job more predictable. Further, the consistency of reaction between the students in this study and those Rico wrote about in *WRITING THE NATURAL WAY* make the role clustering plays in invention even more apparent. Solid conclusions are often not possible, or even desirable in this type of research, but here, perhaps more so than anywhere else in the study, I feel the indications are clear: clusters helped my students invent. As a student wrote in her last journal, "I have learned an easier way of getting my first ideas down on paper so that I can organize them. The maps and clusters have created a very easy way for me to prioritize my

thoughts." For her the purpose of the clusters was clear. They are the tool with which she discovers her topic.

THOUGHTS INTO SUBSTANCE

I created the category called Organization because the students differentiated between organizational techniques in the introductory phases of composition, using clusters, and those that came later as a result of the more hierarchical mapping exercises. I looked for key words like "organize" and its variants, along with words like "arrange," "order" and "classify," among others. In addition, I differentiated between the cluster type maps discussed in the previous category and the maps discussed here. There were 15 pages of entries in this category comprising a little over 10% of all journals.

Comments in this section discussed the role and result the maps had in this phase of the writing process. Except for the two students mentioned in footnote #42, the class seemed to view this phase of mapping as a useful activity. I was not able to determine if it was the mapping activity itself that was troublesome for these two, or the if the mapping was just another difficult phase in a difficult class,

One of the other students wrote, "I am depending more and more on the maps. I write down my ideas and kind of organize my thoughts. After my drafts are created, my readers create their own maps of my ideas. They write down the kinds of ideas they see that I am trying to say. I then

compare the two and filter out what I don't want to say, and what I should elaborate on a bit more." This passage is similar to the other entries I collected. This student viewed maps as a way of organizing ideas. Note the sequence of the entry. First maps help arrange "thoughts." Next these organized (or mapped) thoughts lead to a "draft." After the draft the reader enters with his or her maps, which are used to "filter" elements in the essay that need to be enlarged, or eliminated. This filtering process is apparently carried out by comparing maps and the draft, perhaps just as Black compared highways to snakes by filtering one concept through another as discussed in chapter one. I often saw what appeared to me to be the beginnings of awareness on the writers' parts that they were dealing with an integrated process composed of discreet, but interdependent steps. This student's passage, is an example of that awakening attitude.

Psychologists tell us that humans go through several stages when learning a new skill. First there is what is called "Beginning Awareness" which is described as the point in which we realize there is a different way of behaving. The next step is called "Awkwardness" in which we may even regress as we seek to incorporate the new behaviors. With practice, the psychologists say, we move to the third step called "Skillfulness" in which the new behavior is performed on a consistent basis, but still requires conscious thought. Finally, we reach the last stage called "Integration" in

which the new skill is such a part of us that conscious thought is not required to perform it.⁴⁴ The experience described by the student whose entry I quoted may correspond to stage one in the skills learning process. In a ten week term consisting of 42 class sessions, it may be unrealistic to think that students could progress much beyond this level.

The permanent nature of the maps was also a topic mentioned in this section. I view this as noteworthy because, according to several authors, most notably Flower, the ability to recognize and remember early ideas and responses is one of the elements leading to a sense of control over the outcome. Maps are records, and that characteristic was not lost on the students. "One thing about the maps and writing is that I have something to focus my attention on when I'm writing," writes one student. Later in the same passage he admits to having had a problem with his mind "wandering" as he wrote. He realized this weakens the final product and saw the maps as a potential solution. "I have found that the habit of making maps and then doing the writing has made the task more time efficient." I asked this student in an interview what he meant by "time efficient" and he said he meant he could get done quicker, and "probably get a better grade." In some of his writings Graves suggests that when students say they have nothing to write about the problem is quite often the

⁴⁴. I read about the process of learning new skills in several texts, but I borrowed the terminology from LOOKING OUT/LOOKING IN by Ronald Adler and Neil Towne.

reverse. They have too many ideas running through their heads and no way of grasping onto just one. This has been true in my experience as well. The student who complained that his mind wandered may be a good case in point. His inability to concentrate on a single topic illustrates what I call the Lotus Blossom effect ideas have on the unsuspecting writer. A study by Daiute in chapter one is also analogous to this situation. She found that, in longer sentences, students tended to make agreements between verbs and the next closest noun rather than going all the way back to the subject at the beginning of the sentence. As ideas suggest possibilities to a writer each new possibility is built on its closest counterpart. Eventually this may lead the writer far away from his or her initial thoughts.⁴⁵

The writer mentioned above feels he became more "efficient," yet his basic composing thought processes could not have changed dramatically. Those processes were the result of years and years of developing strategies to solve the writing problem. What changed was his way of dealing with them.

Maps were discussed as developers, organizers and as a means of taking the pulse of the document. The situation is summed up by one student who wrote, "Once we know about our

45. Of course I have no proof of any direct relationship between the way students write sentences and the way they think about papers. I offer Daiute's study here as an illustration and intend it only to be taken metaphorically.

story, we need to place it in order. Then we use maps to help us to understand what we are going to write and put it in perspective." The maps helped this writer to recognize and organize the meaning carried within. Her entry was by no means unique. Each time a student discussed a path through the woods of writing, maps were mentioned as guideposts.

Spatial visualization, among other things, may be a way of taking snapshots of the thinking process. My students often used the word "ideas," or its counterpart, "thoughts." None of the students in these entries wrote about the need for sentences, topic statements, or topic support. I take this to indicate that the maps were operating at the level of idea, or what Frank Smith refers to as composition, as opposed to transcription.

My class was conducted with the attitude that writing was a process consisting of drafts, so the students expected to have several copies of their work by the time they were done, but, it was in small groups and individually that they made the decision to act or pass on specific revision decisions. As for the reader maps, class time was spent discussing ways to read them for revision, but students were left to their own devices in deciding exactly what to do with the information they had gleaned.

MIDCOURSE CORRECTIONS

I considered making the next category of student comments, Revision, a subcategory within Organization, but

so many students wrote about it, often in isolation from other related ideas, that it appeared they viewed the concept as different from merely getting their thoughts together. Altogether there were 15 pages of students comments in this area, comprising almost 11% of the total entries. I was careful about my criteria for selection, including only comments that dealt with solving the revision problem, or making the reader get the point. The students themselves referred to this situation as "the next step," as in the entry: "The next step to my map is to decide whether or not I need to make any changes, or additions. I also have to decide what my top priority is. What do I want to get across to my reader?"

This student has already made some decisions based on the information provided by the reader's map. She has realized that she must differentiate her information somehow so the reader can get her "top priority," and she knows she will have to make "changes" to the information she has, perhaps with "additions" to get her point across. Though she did not discuss the specifics of her decision, the map from the reader provided her with the ground upon which to make those local types of choices.

Another student had a similar experience. She wrote: "When I looked at the map [a student] did for my paper it was exactly like my first map except the way she diagrammed it was different. We had almost all the same words coming off [the subject]. I thought to myself that's 14 different

topics I discussed in three pages. No wonder it took her longer to do my map. So on my revised paper I took the more important topics to me and explained them in more detail, which worked out much better." Linda Flower has written extensively about the problem solving nature of writing.⁴⁶ Even though I do not share completely in her ideas, I do agree that the writer has a crucial need for information with which to make the decisions that will solve the problems written communication engenders. For this student, spatial visualization may be a way in which she can get the information she needs to make those decisions.

I asked a student in an interview at the end of the term what the maps had taught her and she replied, "I've learned to elaborate a lot more on certain subjects to keep my reader interested. I pay a lot of attention to my readers now." She was responding to a direct question about the maps, and, while her concern for the reader fits with the bulk of comments in student journals described earlier, it is her awareness of her need to "elaborate" for the reader that I found most interesting. Authors from Shaughnessy, to Emig, to Flower have written about the difficulty student writers have in developing writing with sufficient detail so that someone outside of the particular experience can get a sense of the writer's reason for

46. In fact, she wrote a whole book about it, **PROBLEM SOLVING STRATEGIES FOR WRITING**, in which she recommends, as one strategy, an "issue tree," which looks quite similar to Holley's hierarchical maps.

writing. Here is a student who, in responding to a question about the maps, identified that problem, and its source: the needs of the reader. Of course I cannot say the maps caused this awareness to grow anymore than I can say the readings caused it. Still, it is hard not to think that the maps had something to do with it. This student seems to think so, as do the others who wrote in this category.

THE CAPTAINS OF THEIR SHIPS

The readings in chapter one made me sensitive to the issues of control and confidence, but I did not decide to give these two topics categories of their own until I saw those words specifically occurring in the student journals. Together, these subjects make up almost 16 pages or approximately 12% of the student comments. Interestingly, writers in the Control category most often wrote about their growing sense of control in relation to some aspect of the revision process. In conversation, three students mentioned to me that they sometimes felt writing was difficult to control, even with the maps, but those who chose to make journal entries tended to discuss the increase in their feelings of control.

I selected comments for this section because the focus of students' description was on their feelings rather than on the specific stage of writing in which they found themselves, or the particular technique they were using. For instance, one student wrote, "Last night while working on the body of my paper I started to really see what was

going on in my map. I actually learned something new..." She goes on to describe what she has learned about how papers are organized. At the close of the entry she writes about how she will "use" the information and suggestions of the groups, the maps and the drafts to "make [her writing] better and more understandable." The students writing in this category greeted this new awareness with enthusiasm. The entries I collected were all from a vein similar to the student who wrote, "I started to get excited...I did not get discouraged. I changed my way of writing..." This growing sense of awareness also parallels the stages of skill acquisition I wrote about earlier.

Closely allied to control was Confidence. The students writing in this category seemed to have good feelings about their abilities to handle these new situations. Positive comments about confidence came more often in the later journals in writings. As one student wrote in her last journal, "In the beginning, I feared in making maps and writing essays. In time, I felt more confident and I grew to understand the daily process." In another closing entry that encapsulates the comments in this category another student looked back over her experience and wrote, "[I] started out as being quite confused in how I was going to prepare and write my paper. I was afraid that I was going to fail in preparing maps. I felt that my map was going to be awful when comparing it to others. As you can see, I did not have enough confidence in myself as a writer...[Now] in

a sense, I think I am headed in the right direction. My work and my writing feels complete. I am more confident when writing my story and when I prepare it."

I cannot ascribe the students' emotional states to any particular tool, or pattern of techniques. The spatial visualization techniques could be connected to the awareness, but so could be many other elements in the class. It is noteworthy that the student quoted earlier singled out mapping as a technique that helped her to "actually learn something new" about how papers are organized when she discussed her growing sense of control. The other student wrote that her writing, "feels complete." While this is hardly sufficient for firm conclusions, it does appear that spatial visualization is at least not counterproductive to the goals of composition, for these students, and the others who wrote similarly.

It is also possible that what these students are writing about is an awakening to their role as a player in the meaning making process. Like the student who wrote, "I am more confident when writing my story and when I prepare it," perhaps they too are beginning to see that they have a stake in the classroom, as well as a seat. The students whose entries I have used are by no means unusual. Indeed, all but two entries in this category had to do with a growth of confidence, or the feeling of control.⁴⁷ Certainly for the student who wrote, "...I changed my way of writing,"

there appears to be a sense of power over the process of composition.

THE SOCIETY OF WRITERS

The category, Groups, is one in which the students wrote about their experiences working through the writing process in association with their peers. It was composed of approximately six pages of student comments comprising a little over 5% of the total entries. There was a structure to these group sessions. Students came together for the purpose of making maps of their fellow group members drafts; sharing maps they had made of their own work; discussing mutual problems and clearing up misunderstandings between writer and reader. Most of the group activity centered around the maps, but a significant amount of time was also spent brainstorming, conversing, or dealing with localized problems in specific essays. After the initial introductory period of the course, the students spent about 70% of class time in their groups.

Group work is a common feature of classes at my institution, so no students were experiencing it for the first time in my class, and in fact, some students were old hands at dealing with their fellow schoolmates. I used the results of the Miller Daly Test of Writing Apprehensiveness to assign students to individual groups.⁴⁸ Each group consisted of at least three people and no group consisted of

⁴⁷. Those two entries belong to the students I wrote about earlier in the section on the reader.

more than five people. Perhaps because of the small number of entries in this category, the descriptions of students' experiences with the groups was fairly consistent. The students found their group experience to be a positive one. For example, one student wrote, "I believe that the experience we had with the self help groups proved beneficial. They help me to realize I do have to pay attention to the reader." Another student wrote, "I like the idea of groups, because they give input so you know how you're doing." "Input" from many different sources plays a major part in the creation of a writer, according to authors from Brande to Elbow. Paying "attention to the reader" is also high on the list of advice from writers as varied as Edgar Allen Poe and Mickey Splaine.

In THE ABC'S OF LITERACY, Stephen Judy has written, "In the process of writing, students themselves will come to discover the kinds of structures they need to use to find success with an audience." (pg. 126) I take that to mean that there is no clear way to predict which specific approach or method an instructor uses is going to match a student's needs. Judy, foreshadowing writers like Elbow and

48. I make no claims for or against the Miller Daly test. I found it to be an easy and convenient way to classify my students according to their perceptions about writing and themselves as writers. I put high apprehensives with low apprehensives in an effort to create heterogeneous groups in the hopes that weakness might be matched with strength. It is an approach in which I saw little harm. In a worst case scenario it merely allowed students to meet people outside of their immediate circle of friends, at best, it gave high apprehensives a peer model to help them overcome their own difficulties with writing.

Berthoff, suggests that students who are exposed to the process of writing will find their own way to become meaning creators. The students quoted above who found the group's "input" to be beneficial appear to me to be examples of these authors' ideas.

THE METHOD IN THE MADNESS

Another example of the point these authors, among others, are making may be the Map category. The sole criterion for classifying comments into this category was students writing about the mapping technique as a separate entity and not part of the larger composing process. Because this approach was new to the students they may have felt the need to discuss the technique itself as if they were explaining it to someone who was not a member of the class. A student comment that was repeated in tone throughout this category was, "[The new approach] is called the mapping technique. This technique has two main purposes, to help the originator put thoughts and ideas in order and to help both the originator and the reader decide what is most important and what should be added or deleted." This particular entry was written early in the class when we were still discussing maps as a group. We had talked about maps done by the author and maps done by the reader, but this student put them together in order to "decide" what the "most important" parts of the paper would be.

This student appears cognizant of the process aspects of writing, the bargained nature of meaning, and the role

played by the participants. She came to this position while discussing the purpose of the "Mapping Technique" which we had been discussing from a relatively mechanical viewpoint at that particular time.

Comments in this section often echoed other categories, but emphasized procedures over results. In describing the clustering stage of mapping one student wrote, "Instead of outlining your thoughts and worrying about order you can write whatever comes to mind and whatever order you want. In a sense, the mapping technique allows you to free write." Free writing is an approach used in several classes at my institution, but the connection of the two is something the student did herself. The psychologists reviewed in chapter one, specifically Petrie, would see this as an example of use of metaphor in learning. By finding relationships between something she did know (free writing) and something new (maps) the student internalized and accommodated the new information into her theory of the world. She appears to be practicing what Herbert, also discussed in chapter one, referred to as apperception.

Spatial visualization techniques are, in a sense, metaphors for the author's thoughts and the reader's response. By mentioning the maps so often when discussing the elements of the class, my students may be saying that the maps are tools of accommodation. By that I mean that the visual nature of the maps provide a link between the familiar aspects of the writing process the students have

undergone in other classes, and the new demands placed on them by the current situation. Having something they can hold in their hand, talk about and look at, is apparently more comforting than trying to grasp the abstract relationship between readers and writers; the importance of symbolic elements in the writing process; and all of the myriad aspects of a higher level composition class, usually presented to them in the traditional one or two channel way through lectures and readings.

Other comments in this section were about specific maps, such as the student who, describing reader maps wrote, "Maps represent how readers feel." Since so much of the emphasis in an academic setting is on intellect I saw this student's choice of the word "feel" to describe the reader's map as particularly interesting.⁴⁹ A response is composed of thinking and feeling, but the feeling often gets lost in the attempt to put thoughts into words. For one student anyway, it appears that an awareness of the nature of response has begun, and the maps are performing a catalyst function, playing a role, along with other elements in the class, as initiators.

⁴⁹. Of course the student's word choice could just be an accident, or she could have meant think, but wrote feel. In the absence of any proof one way or the other (I never got to ask her about it) I think that in an informal, ungraded writing exercise such as a journal, she was more likely to be honest in her comments.

THE REASON FOR IT ALL

I named a category Meaning because of comments by students in which they describe, not so much their experience in the process, but their views on the results of the process: understanding. The category contained a little more than four pages of student comments comprising about 3% of the total entries. Again, perhaps because of the small number of entries, the responses were very consistent with one another. This section centered around the difficulties students had in solving writer/reader problems. Discussing group sessions, several students made comments similar to this one: "[It] Seems funny how we had a difficult time in class today. Everyone got something different from [the essay]. Which is not unusual since we all interpret things differently." Another student commented, "Writing is something that you learn from teachers and parents, but how and what you write comes from you." These two students are apparently becoming aware of the fluid nature of the relationship between the writer and the reader. Their comments were not isolated. Even though there were a small number of entries in this category, they all contained the same sense of meaning as a growing and changing concept rather than a standard. In addition, the student who commented "what you write comes from you," appears to reflect the writings of Judy, described earlier, which maintain that students learn to write by experiencing as many writing environments and readers as can be provided.

Like the student who, when asked what writing was, replied, "spelling," my experience reading the class journals and talking with the students over the length of the term, made it apparent to me that, even if they seemed to accept the assumption that meaning can be generated internally and modified externally, they appeared to cling to a strategy that led them to "write for the teacher," which in most cases was spelling, grammar and vocabulary. At the end of this course, even though the student quoted above had found success in the clustering exercises, for her writing was still "spelling." She wrote, "I feel if you have to [sic] many misspelled words you will cause your reader to lose track of what they are thinking, which makes your paper seem hard to understand." Even here though, the reader has appeared, perhaps giving a reason for the necessity of spelling rules.

THE WIDER WORLD

I have put the category Other at the close of this chapter because the comments are made up of scattered subjects that did not fit into previous sections. It contains over 15% of the total entries making up a little more than 21 pages. Most of the comments in this section were general musings by the students about the class in particular, or writing in general. "My thoughts on writing vary with my intentions," one student wrote. When I asked her what she meant by that she replied that she liked writing in her diary better than in class. Another student

wondered why, even though she liked reading very much, "writing is difficult for me." She had no answer, but seemed convinced that there was a direct connection between the two.

The word awareness seems an appropriate characterization for the general tenor of entries in this category. Dr. Martin Luther King once said that before a problem can be solved, it must be recognized. What these students, as well as the others who wrote in this section, but whose entries I have not included, may be formulating are the questions which will eventually lead them to solutions of their own writing problems.

Awareness, which is their first step, may grow out of a tension created by the way things are, and the way the student thinks, or wants them to be. Perhaps for the students who wrote about them, the needs of the reader can provide the stimulus to search out new writing behaviors. For others, it may be the need to further explore the effect of their "intentions" on the process. Even the writing-is-spelling student ascribed her need to spell correctly to the needs of the reader in her last entry.

I believe the spatial visualization techniques may also initiate further investigations of the writing process, because considering my students' comments, it appears to provide a vehicle for growth in several different areas. It may even have helped to create a crack in the "spelling" student's perceptions about writing.

I look back over the comments in the journals and see all of the little discoveries students made throughout the term, but I do not feel I can point to any technique, or method, or assignment and say this is where the class learned to deal with the reader, or this is where the class learned a particular lesson for that matter. Because of that, any of the methods employed in this class, and probably at one time or another all of the methods, are effective in providing the link between the way things were done, and the way they could be done.

I have attempted in this chapter to build the lens with which to focus more specifically on the students described in the next section. Perhaps a brief summary of the elements of that lens will help to sharpen the image I am about to describe.

This was a class in which students became more aware that the reader could be a part of the writing process. Even students who were intellectually aware that their papers were read by other people found new levels of connection. It was a class that discovered and apparently accepted the use of cluster maps as a tool for invention. These techniques appeared liberating for the students because they removed the pressure of transcription from the composing process. They were, as one student commented, non-linear free writings.

The more structured maps appear to have had three main purposes. First, they provided a framework within which the

essay could be prioritized, and they opened a line of communication with the reader. They were, in effect, a metaphor for the goals of the work, and a contract through which meaning could be negotiated with the reader. Second, as a result of this negotiation the framework of the essay changed and with it the map's metaphorical representation. And third, as a result of the first two, the maps became a progress report of sorts, identifying the particular stage of completion in a way that could be analyzed and discussed.

The sense of control over the writing process and the feelings of confidence it engendered, rose over the length of the term. My students saw themselves as part of a community of meaning makers who could share with each other the previously isolated and abstract elements of the writing process.

These are the elements of the lens which will now be focused on six individual students. These students were picked because, like their fellows, they too discovered new elements of the reader/writer equation; they too developed maps and negotiated with the reader over them; they too shared in the community of the classroom. In short, they were picked because they represent individually what participants in this study experienced over all.

CHAPTER FOUR: DESCRIPTION OF RESULTS

(Individual)

In this chapter I present a description of specific students' experiences with the spatial visualizations. In addition, at the close of this chapter I describe the experiences of two students who used computer software to compose and edit their papers. I call this chapter individual because its purpose is to use the lens of chapter three to focus on each of these students in an attempt to provide a description of the use of spatial visualization techniques at the personal level.

To track the relationship between the maps and the developing essays, I made lists of all the words a student used in each map, then looked first for those exact words, then for related words or ideas in the essay. I also made a list of the ideas that appeared in the essay, but not in the maps. The three maps that I looked at were the original cluster, the writer's map, drawn usually after the first draft, and the reader's map, also drawn after the first draft. I will describe each map in its own section, first with some general comments about how the map was used throughout the class, then, more specifically, using a student essay.⁵⁰

Clusters were generated in a very short period of time, occasionally just a few minutes. In my class, there were 15

50. The original maps are in the appendix

ideas, on average, attached to the central circle of the cluster. Of the original ideas, an average of eight appeared exactly in the final essay. On some occasions the decision to cut a particular idea was conscious, but as students mentioned in interviews, they simply forgot about some of the original ideas once the essay began to take shape. All of the students in the class except three,⁵¹ reported that they did not return to their cluster after the first draft was completed.

This behavior fits with the purpose of the clusters as detailed by Rico. As tools for invention, the role of the cluster is to get things started. The schematic arrangement of informational words or phrases around the central core of the clusters is not able to account for variations in the importance of the information generated. Because clusters produce undifferentiated information, their usefulness apparently declines as the students enter the organizational phase of composition. Once there was a developing body to the essay, my students focused their attention on the balance between the local and global issues the draft itself produces. This phase of the composing process was described in more detail in a study done by Flower, discussed in chapter one.

51. These three were the two who had difficulty with the role of the reader, mentioned in the previous chapter, and a third female student. These three students were reluctant to participate in the drafting process, preferring to write one copy only. They were often absent on days when the class would work together on their drafts.

Once the clusters were complete, my students began the process of prioritizing the material, even if it was just making full sentences out of key words on the cluster.

CLUSTERS AND COMPOSING

Shirley Daniels is an example of how my students used clustering. She is a 20 year old accounting major in her second year. She had put off taking English because, even though she had earned C's and above during her high school English classes, as well as a C in the first English class at my institution, she did not like writing.

Shirley made use of clustering throughout the term in my class. She had positive feelings toward the technique, and was able to do it on a variety of assignments with consistent success. Elements of the clusters always appeared in the essays she wrote which indicated to me that she was not just performing the assignment, but using the information generated by the clusters.

I asked her to do a clustering exercise with the word "Writing" at the center. She produced 16 mostly single words in a balanced circle around the core. The words are: "boring, communication, over-rated, tension, impossible, pressure, conscious, aggravating, impatience, time consuming, school, headaches, tiring, hard, insulting and testy." Of these 16 words, 7 showed up exactly in her final essay. They were: "Communication, conscious, aggravating, time consuming, headaches, insulting and testy." In addition, certain other keywords in her cluster turned up in

the final essay as ideas, or descriptions that did not use the exact wording of the original. For example, she did not use the word "school" in her final essay, yet all of the examples of writing she discussed dealt with assignments from teachers. She also mixed some ideas together in her examples. At one point, discussing her difficulty concentrating, she wrote, "I seem to think such things as, 'I could be doing something more exciting and enjoyable with my time.' 'I am so tired,' or 'This is so dumb and hard how do they expect us to do this?'" Here she blends several ideas from her cluster, most notably, testiness, pressure and impatience.

This blending of words and ideas from the original cluster was a common feature of the way Shirley used clustering. Shirley told me that she viewed what she had written in a cluster with an eye to organizing it, looking for relationships among the ideas she had put down. In that respect she resembled the proficient writer Flower discussed in chapter one, who focused their attention on global issues first as they worked through the rhetorical problem.

In an interview, Shirley mentioned that she seemed to write "the same idea" down in "different ways." Indeed, 14 of her 16 words have something to do with her negative reaction to writing. Her paper, not surprisingly, was a description of her unfavorable feelings towards writing in general, and school writing in particular. Her thesis statement read, "I feel very little for writing. It seems

to be time consuming, physically straining, and insulting." The last term referred to her strong feelings about having to read aloud what she had written, or have others read it.

I noticed this kind of consistency in many of Shirley's clusters. She began with an emotional reaction to the subject, then, through the clustering process appeared to search out terms that helped to describe that feeling. This is similar to what Rico suggests as the two halves of the brain are given time to interrelate.⁵²

The open structure of the clusters themselves seemed to fit well with the open nature of Shirley's thought at this stage of the composition process, and, having the cluster on paper for reference apparently made the next step, prioritization, easier for her to initiate.

Prioritization is the step in which I originally felt the maps would be most useful. In this stage, my students used a variation of the hierarchical maps described by Holley. These maps were either top down in form with the subject at the top and more and more specific information going down the map, or turned 90 degrees with information arranged across the page from left to right. Computer majors in the class mentioned the similarities between these types of maps and flowcharting as a reason for preferring to do their maps hierarchically. My students were exposed to

52. I am not making a case for right brain left brain theory necessarily. I am merely reporting that my observations are similar to Rico's. My conclusions are necessarily somewhat more limited.

many different mapping styles and practiced most of them in dry run settings, but on essays they returned to the hierarchical organizational format.

Some of the map formats presented to the class were interesting according to the students, but their attention was primarily focused on the paper itself. One student pointed out in an interview that the point was to get the paper done, "not some art project".

It appears that, in order for the maps to be a tool for my students, it was important that they fit as neatly and as quickly into the process as possible. Students who view map making as taking away from time that would otherwise be invested in getting the assignment done might be less likely to use the technique.

MAPS AND PRIORITIES

Donald Westfall used the hierarchical maps. As a 45 year old adult who was returning to school after more than 20 years as a farmer, he had more than the usual number of experiences from which to draw subjects for his papers. He also had many more years of developing writing habits than most of his classmates. Donald was one of the students that had trouble coping with the reactions of the reader. Several times in journals and conversations he mentioned his frustration with the reader "taking over" his paper. Apparently, most of the writing he had done previous to the class had been what Flower refers to as writer based. He wrote to please himself and operated under the assumption

that if he understood it, so did everyone else. Donald was a clear writer; however, and most of the readers' comments about his work had to do with nuances, or degree.

For one assignment in the class, Donald decided to write an imaginary interview with Moses. He was very active in his church and familiar with the Biblical story of Moses, but to refresh his memory, and make certain of his facts he reread the Bible and went to talk to his Pastor. His original cluster had "talk with Moses" in the center and nine stems comprised of the following: "Ten commandments, Seeing Promised Land, Not allowed to enter Canaan, childhood, burning bush, Speaking to Pharaoh, Plagues, Leaving Egypt, Roaming desert." As Donald did the research for this paper the focus began to shift from an interview to a discussion of Moses as an example of the elements of leadership.

Because of the shifting and complicated nature of what Donald was attempting, he decided to make two maps of his drafts. The first was hierarchically arranged from the top of the page to the bottom. At the top he wrote "Talk with Moses." directly under that was "What I know"⁵³ and, as an offshoot of that section, was a list of six statements: "baby, childhood, flees Egypt, returns to free slaves, Leads Israelites into Siani, Ten Commandments." Further down the

53. The students at my institution are taught Macrorie's I-Search technique, although it was not required on this assignment. Donald chose to use that particular structure on his own.

page, under "What I Know" he wrote "What I think I know" with an offshoot containing four statements: "poor speaker, got to know the Siani desert, inspired by events, charismatic leader." Further down the main vertical line of the map he wrote "what do I need to know" with an offshoot containing four more statements: "True relationship with God, Uncanny knowledge of the desert, how came up with 10 commandments, how maintained leadership."

Finally, at the bottom of the page he wrote, "Who do I talk to" to which he added two offshoots, one going down from the question which contained the name of a local geography teacher, and another going off to the left of the question that contained the name of his pastor.

What Donald had created was not only a plan for his essay, but apparently a plan for himself as well. He talked all through the project of the complexity of the task he had chosen, yet, because of his interest in the topic, he wanted to see it through. The blending of information and procedures in the first map was entirely his own doing. It was apparently not a truly conscious act. As he said, he was mainly thinking of how to get the paper done, and how he could get what he needed. He did not remember deciding to draw up those decisions in a plan of action in a map. That is what happened though because, as Donald went through the steps he had laid out for himself in this map, talked to the people, read and reread his sources, he came to the conclusion that he needed a second map.

The second map is also a vertical hierarchy, but of a much more complicated structure. Across the top of the page from left to right is the title "Events in Moses' Life." Underneath the title are six statements. From left to right they read: "Infancy, educated in royal palace, murder overseer, flees Egypt, Lives and marries in Siani peninsula, learned to survive in the peninsula." The first four statements are further categorized into the section "1st forty years of life," and the last two are in a section titled "2nd forty years of life." Diagonal lines run from each of these division of Moses' life back to the center of the page. Where they meet another vertical line is drawn downward on which is written, "Confrontations with Pharaoh" Beneath this is a vertical list of the plagues visited on the Egyptians. At the bottom of that list Donald wrote, "Moses leads slaves from Egypt into Siani desert." A line runs from this statement to the right side of the page and then turns upward. There are nine statements along this line. They are, from bottom to top, "Lack of food, Lack of water, judicial problems, Ten commandments, Not born leader, poor speaker, Lord was actual leader, predestination, question." The first four of these statements is labeled "3rd forty years of life," the next three are labeled "Pastor," the last two are labeled "My thoughts." Pastor, refers to information gained by an interview with the local Reverend.

This second map may be a picture of a journey down, around and back to a discovery of the context in which Donald wanted to present his information. The top of the second map is not much different from the first map, dealing with mostly biographical and historical information about the life of Moses. As the map reached the bottom of the page; however, and turned back upward, the character of the information changes. The first two divisions of Moses' life into forty year segments deal with biographical information such as "flees Egypt," but the third forty year segment describes not biographical events, but problems (judicial, survival) Moses' faced as the leader of the Jews.

The emphasis appears to be shifting away from merely historical descriptions to something more analytical. It is not a mistake that the third forty year division is not connected to the first two. Donald said at this time he began to focus in on Moses as a leader and became more interested in the leader's later years. The section subtitled "Pastor" also contains information that is not merely historical. In this section is the statement, "not a born leader." and right after that is the section labeled "My Thoughts" in which is the statement "questions." Elbow, among others has written about how some authors must write their way to a topic. As writers, we are not always sure what we want to say until we have said it. Donald's map may be a visual representation of his search for a topic out of his interest in Moses. The fact that the map begins with a

straightforward historical organization and ends with the word "questions" is significant of the journey Donald is taking. It is as if he is manipulating his way through the material trying to find a context in which it can be developed. The map becomes a record of the steps along that journey. Or, to borrow Elbow's metaphor, Donald's map may have been the recipe that allowed him to cook the ideas moving through his head.

The answer to the "question" at the end of the map is going to be developed by retracing the steps of the map with an eye towards Moses as a leader. That is what Donald did in his final essay. Indeed, Donald mentions all of the major, and most of the minor points listed on this map in his essay. He starts out with the birth of Moses, but his descriptions lean towards the political and social climate from which Moses emerged as a leader, rather than reporting the findings of his research. Statements like, "The Pharaoh eventually realized that the Hebrews were growing in population and were a potential threat to their sovereignty." and "Moses really didn't consider himself a leader," show the direction this simple historical narrative has taken. Donald appears to be going back through the information he collected in his map and recasting it in the light of what he has decided is important now. Originally he wanted to write a make believe interview with Moses. What he ended up with was an analysis of leadership using Moses as an example. The subject grew in him as he went

through the steps, and the maps appeared to enable him to keep a firmer footing through the shifting, liquid nature of his information and his goals.

What happened to Donald reminds me of Shirley's experience. Two elements are necessary for writing, information, and a stance with which to organize that information. Shirley had her stance first in her negative feelings towards writing and her cluster reflected that stance by the details she chose. Donald had information but his stance changed as he worked through the details he wished to include. In both cases the maps appeared to hold some parts of the composing process static while others changed, then became records for reference when the new essay came into view. Even though Donald set goals and changed them, it was not necessary for him to start all over. Work he accomplished was saved and could be adapted to the new direction. It seems to me he exemplified the shifting nature of the goals writers set as they solve the rhetorical problem which was discussed by Flower, described in more detail in chapter one.

Special care had to be taken in helping the students learn to get useful information from the maps readers did. Often, in the pilot study particularly, students would quantify information by looking to see if the same, or similar key words were used, and if they were, pay little or no attention to how those key words were organized. Setting aside class time in the major study to deal with the problem

of interpreting reader maps seemed to help. Students in the major study made a conscious attempt, through discussion, to interpret reader maps, whereas students in the pilot study had merely checked them for similarity of information and let it go at that.

THE READER'S VOICE

Annie Cabanero was not a student who often had trouble discussing her readers' responses. A 25 year old transfer student who earned a 3.3 grade point average at my institution, Annie was a secretarial major just finishing up what should have been the second term of a three term program. Her writing was clear and straight forward, her maps were generally of the flowchart variety and her comments about readers' responses to her writing pragmatic and positive. She seemed to have a good sense of what to do with reader maps and often mentioned that they were helpful in "fine tuning" her work.

For one of her assignments, Annie chose to write about her experiences as a transfer student. Her first map consisted of two horizontal rows across the page from left to right. The first row had three boxes. Box one was labeled with the name of the college which she had started attending, and her major. Also in box one was the statement "good attitude." Annie told me that referred to her attitude when starting school. Box two describes her experience at the first institution with the statement "things went well." On top of the line running from box two

to box three is written the word "Transfer." Box three contains the name of my institution and the statements "Curriculum change, new student, very frustrated, unable to finish when expected." The second row of boxes is a continuation of the top, also containing three boxes. Box four is titled with the term date and contains the statement "Problem with scheduling." Box five contains the date of the next term and the statements "Could finish, no schedule, possible full time." The last box also contains term date for the subsequent session and the statements, "finally finishing, independent study." Underneath these two rows of boxes a line is drawn horizontally across the entire page. Under that line, in the center of the paper is the statement "Finally finished, took five terms rather than three." Annie's paper follows this map very closely even taking the exact statements from the boxes and turning them into full sentences with explanatory examples attached.

The map her reader made is the more traditional, in this class anyway, top down hierarchical type. At the top is the name of my institution with four lines coming out from underneath it. The first line goes down about a half inch and then off to the left of the paper. At its end is the statement "Transferred." Directly underneath this statement is "Considered new student," and underneath that, "Couldn't get classes. The second line coming out from the main topic goes straight to the bottom of the page. At the end of the line is the statement "Finishing in fall," and

underneath that "Stayed with it even though frustration set in." The third line coming off of the main topic goes about half way down the page then turns to the right. At the end is the statement "Have taken classes that would not transfer," and below that "Attending longer than anticipated." The fourth line from the main topic goes down about a quarter of an inch, then turns right. At its end is the statement "Quick quality education---quick employment."

Annie's map was done by a male student named Wayne Fiscus. Even though Wayne and Annie were in the same self help group and had talked about her paper on several occasions; and even though Wayne was a transfer student himself, he still produced a map that surprised Annie by its construction. Her first concern with Wayne's map was the fact that the experiences after she came to my institution had not been kept together. She saw the essay as developing chronologically and it bothered her that she could find no way (top to bottom, or left to right) to read Wayne's map that way. In her comments she mentioned that she had purposely started out her paper with some positive comments about the college, yet it seemed Wayne had put those at the end of the map.

After some study, she decided that the map was meant to be read from top to bottom because the bottom talked about finishing. Even though the lines for the statement came out of the name of the institution at the top of the page, she decided that they were really developments as the reader

progressed down the central line of the map. That was why, in her view, the good things she had to say about the college were very close to the college name. Transferring was, even though across the page, only slightly below the college name. Finally, the statements about staying longer than anticipated, again, even though across the page, were just above the statements on finishing.

Annie was very happy that the term frustration came through, and the fact that she was going to tough it out. Those two elements were very important to her story and provided the stance in which she described the events that befell her. Once she had worked out a way to see the map as a type of chronological development, her next concern was to find a way to make the structure of her essay more visible to the reader. Even though she had succeeded in interpreting Wayne's map in a chronological fashion, she remained concerned that her structural decisions could be overlooked. She briefly considered using words like "First, then, next," but finally decided to use paragraphing to help show movement through time. Shirley decided to reduce the amount of space given to talking about her previous institution because the reader "Hadrn't noticed it," and "it wasn't that important anyway." She had considered describing some other experiences she had, but decided in light of Wayne's map that she had gotten her major point across and outside of the new paragraph arrangement and the cut down introduction, not many changes would be necessary.

After she made these decisions, she put Wayne's map aside and went about revising her essay. The revision, true to its promise, contained four more paragraphs than the draft, although there was actually less information in it, due to the reduction (down to three sentences in the body of the work) in the material about her old school.

Annie told me she used Wayne's map for two basic purposes: organizational and as a measure of the response to the stance she intended. Her first comment about the map was that it did not reflect the chronological structure she had intended for her essay. At first she placed the blame for that discrepancy on the map, and not her essay. She made several attempts to interpret the map chronologically and was eventually successful. She decided that the elements of the essay were listed chronologically on Wayne's map by their proximity to the central idea at the top. It is true that, when viewed this way the elements do list out as they occur in the essay, but Wayne mentioned that he did not choose this organizational scheme consciously. In fact, Wayne did not recall choosing any particular scheme. He stated that he just "reacted" to what he read "without thinking too much about it." He also agreed that Annie's interpretation of his map was a valid one and mentioned that he "guessed" he knew how the essay was developed and so "didn't pay a lot of attention to it." "It made me think of my own problems with transferring," he wrote in one journal.

It was obvious to me that Annie's essay was organized chronologically. The first sentences of her body paragraphs in the draft Wayne mapped were as follows: "I attended my first term at [her old institution].; An unexpected move came about and I had to transfer to [my institution].; [which] considered me a new student rather than a returning student.; I finally made it through my first term at [my institution] and began planning for the next term." Frank Smith, Louise Rosenblatt, and many others have written about how the reader looks beyond the words for the meaning. This appears to be what Wayne was doing. His own familiarity with the subject, plus his association with Annie in the editing groups, may have caused him to look into the essay for meanings. Because of this, he may have paid less attention to the structure of the essay than he might otherwise. In addition, by choosing the standard development structure of the narrative essay, chronology, Annie may have confirmed Wayne's expectations about the structure of what he was to read, so he may not have paid much notice to something that he expected to see.

Annie's insistence on interpreting the map according to her plan is a noteworthy development. She was, by her own admission, not a confident writer. She did not like writing, but admitted her main problem was her "attitude," not her abilities. Annie had consciously chosen to develop her essay as she had, and felt that she had done an adequate job. Her refusal to abandon that belief in the face of

conflicting information is indicative of one of the ways she used reader maps. Annie's first loyalty was to her essay. She did not merely accept the discrepancy between Wayne's map and her goals. She tried to find a way to fit the reader's comments into the framework of the essay with the least amount of disturbance. Annie felt very strongly about the basic organizational decisions she made and the emotional stance she tried to create. Within that framework she was very willing to listen to what the reader had to say, but comments about these two elements generally provoked defensive reactions and searches for interpretations that would fit with the decisions she had already made.

Annie was quite pleased that Wayne used the phrase "stayed with it even though frustration set in," as one of the elements of his map. She was also pleased that he placed it at the end of the map as she saw that particular point as the climax of her essay. Wayne mentioned that he knew, both from the reading and the group work, that Annie was feeling frustrated with the obstacles she had encountered as a transfer student, and, indeed he had felt that frustration also, when he transferred. He also knew that Annie was determined to "tough it out." The interaction between the two in their groups casts a shadow of doubt over the role of the reader's map here, but Wayne did not know that Annie considered determination in the face of frustrating circumstances to be the high point of her

essay. While the appearance of the statement may not have come solely from his reading, Wayne's placement of the phrase at the end of the map may denote that Annie was successful in her organizational placement of the section.

I asked Annie if it concerned her that, even though she intended her work to illustrate the frustration she felt as a transfer student, Wayne had only mentioned it once in the entire map. She indicated it did not because the term was there, and that had been what she wanted. Annie looked first for the similarities between what she intended and how the reader responded. If there was any connection between the two at all, even if it was a single word, she appeared to be satisfied.

The essays we wrote were all of the non fiction prose variety, and the emphasis of the class was on learning to develop a thought. That may have contributed to her acceptance of even the slightest indication that her thought had been received, but Annie was also concerned with her own emotional stance within the topic and with keeping the "interest" of the reader. At first it appeared to me that she was using the reader maps as a "reality check" to see if she was being understood on a literal level. When I asked her about the degree of frustration she described in her essay, she did not appear to understand that maps could be used as gauges of the depth of her description, or the degree of detail they included, and that this depth and

degree contributed to the involvement and interest on the reader's part.

I knew it was not because she was unaware of what to do in these situations because we often talked about how to make the reader see something that the writer considered important, or to spend less time with an issue the writer considered minor. In fact we had a saying that developed over the course of the term: "If they can't see it, make it bigger; if they can't see past it, make it smaller." What this referred to was the degree of detail a writer put into a particular element. This increase in the size of a particular element could be handled quantitatively by simply adding more words, or qualitatively, by carefully choosing the words used. Conversely, if the reader seemed to attach too much attention to a particular passage, similar techniques could be employed to reduce the visibility of that passage.

Annie's decision to accept the level of Wayne's response may be indicative of how she viewed the function of writing. In speaking with her and in reading her journals as the term progressed, I got the impression that her concept of writing was limited to that which Britton refers to as transactional. She was most concerned with the transmission of intellectual over emotional elements, and even though she had felt great frustration as a transfer student, she was apparently willing to accept only an intellectual response to that frustration on Wayne's part.

A CODA FOR "TRADITIONAL" MAPS

In summary, it appears that the clusters and maps participated in several important stages of the writing process for my students. Clusters allowed Shirley to isolate elements of her thought. Because she was able to produce something on paper at once, without the added pressure of form, or threat of evaluation against some standard, clusters appear to have helped her get off on the right foot as she began the composing journey. Judging from her reaction, this apparently affected her attitude in a positive way and increased her sense of control over the undertaking. The clusters also may have operated as a tool of analysis giving Shirley a vehicle with which to break down the elements of her attitude towards a particular topic.

Donald's maps appear to have assisted in the next step of the composing process by allowing him to control the development of his essay and change direction without an unacceptable amount of wasted effort. Donald's experience is a good example of how fluid and changing all the elements of the composing process can be. Hardly anything stands still once the procedure is initiated. Ideas ebb and flow, priorities change, decisions are suggested, made and abandoned, new information comes into play and always there is the task of placing the result into the sometimes confining shape of words on a page.⁵⁴

Psychologists and psycholinguists from Huey to Frank Smith tell us we can only concentrate our attention on a small area of our environment at any given time. Donald's maps may have provided a way for him to focus and record his ideas throughout the diverse, often contradictory demands of composition. Like taking a number at the local butcher's shop, maps may have allowed Donald to better serve the clamoring ideas entering the organizational shop.

Wayne's map, on the other hand, appeared to give Annie a measure of how her essay was being received on both fronts, informational and emotional. In a situation that may be analogous to the one I am describing, much of modern management theory touts the benefits of "shared authority" rather than the old hierarchical, autocratic, "Top down" style that characterized American corporations in the first two thirds of this century. Wayne's map may have given "labor" as it were, a say so in the finished product. Lack of awareness of the reader by Annie could have created an autocratic approach to composition; a "What's good for General Bullmoose is good for the USA" approach to communicating in written form.

Wayne's map may have been the visualization that opened lines of communication between author and audience. Together with Annie's map they can become the minutes of a negotiating meeting, recording decisions, priorities and

54. This process is described in more detail by Flower, cited in chapter one.

reactions from two different bases, and providing the foundation for a successful agreement, what management theorists call a "win-win" situation.

Wayne's feedback during the production stage complicated Annie's compositional problem somewhat, but may have had a role in producing what both students felt was a better result, just as quality circles in the auto plants are intended to help to produce better cars.

"NEW AGE" MAPPING

The writing software I exposed the students to is called "Writer's Helper Stage II," written by William Wresch of the University of Wisconsin and published by Conduit Inc. According to the introduction in the user's manual it is, "a collection of activities to help students write and revise essays. The activities, appropriate for a variety of writing assignments, are arranged into two major sections: Prewriting Activities [and] Revising Tools." The major sections contain three subsections with between three and nine activities each. The software is menu driven for the most part, and does not presuppose a great deal of computer knowledge on the part of the user. It purports to take the student from initial idea generation all the way to finished product.

I will focus my description on Kathy Martin, a 36 year old adult student returning to school to pursue training in a secretarial field. Her writing was generally clear and relatively free from mechanical error, but as fits the

research profile for adult learners, she was unsure of her abilities and apprehensive about competing with traditional students in the classroom. She had some computer experience previous to my class and was familiar with common word processing softwares. Kathy liked using the word processor for her papers and, even without using Writer's Helper, had been turning in assignments done on computers.

The paper she chose to write using the software was to be an argumentative essay. Her eventual thesis was that teen pregnancies could be reduced if the government supported strong sex education programs in the schools, banned government funded abortions and used that money to fund more teen pregnancy prevention programs. When she started the project; however, she just had a notion that she wanted to write about teen pregnancies because she had the feeling that not enough was being done to prevent them in the first place.

PREWRITING ELECTRONICALLY

Kathy started with the first subsection of Prewriting called Find. Find contains six activities which are: Starters, Idea Wheel, Associations, Questioner, Lists and Brainstorms. Starters gives an initial phrase or statement for students to react to such as "After losing control of the....," or, "In 1970, 43% of U.S. adult males smoked; now the figure is 35%." This activity is primarily designed for "students who never know what to say" according to the manual and, since Kathy already had an idea of what her

paper was to be about she did not complete this exercise. In fact, even though Kathy tried all of the activities in this section, she could not find one that she felt helped her personally.

In her journal though, she mentioned Associations and Questioner specifically as useful exercises for someone who had not already made up his or her mind on the topic. Associations is an activity that provides cue words to which students react however they please. This is similar to clustering, except the computer is providing the central word. Initially the computer draws from a list of 15 cue words such as Sleep, Copperhead Snake, Saxophone, or Movie Stars to name a few, but it can be programmed to list whatever words the instructor, or student might desire. Because Kathy had already clustered out her ideas around teen pregnancy, she did not complete this activity.

Questioner is similar to Association except that it uses rhetorical questions as a basis for the students connections. The machine can generate 21 different questions ranging from, "Who is the strangest person you know?" to, "Is a college degree necessary to be successful in life?" It can also be modified to ask specific questions. Students respond to the questions as much or as little as they wish. Those responses are saved and can be called back up in later, more organizational exercises. This is also similar to clustering because responses are simply recorded and no attempt is made to organize, or

prioritize them at this stage. Kathy mentioned that there were some interesting questions in this section that, again, if she had not already decided on a topic, would have been useful. Even though Kathy had made some initial decisions about her paper, she still responded positively to the activities which resembled clustering.

THE COMPUTER AS COACH

The next subsection under Prewriting is called Explore and it contains six activities. As with the activities in the Find subsection, Kathy was not able to use some of these drills as they were designed because she had chosen her topic, but she did go through them in an attempt to get help with her paper. One in particular that she wrote about was Three Ways Of Seeing which, according to the manual is based on RHETORIC: DISCOVERY AND CHANGE by Pike, Becker and Young.

This activity allows the student to choose a topic, then asks a series of 12 to 15 questions about that topic. The questions are organized into three groups: isolation questions, such as "What would be a good brief description of [the topic]," process questions, such as, "What has changed about the importance of [the topic]" and network questions, such as, "What about your subject is worse than other [topics]." Kathy did not like this activity at all. She found it very time consuming (even the manual admitted that) and much too complicated. "You get bogged down in the details and forget what you're supposed to be writing about," she wrote.

I suggested (as did the manual) that she just go through one group of questions rather than all three. Kathy thought that would help, but I got the feeling she did not see much value in the activity. She wanted to focus her efforts rather than diffuse them. Kathy felt "bogged down" as she went through this exercise because each way of seeing opened new possibilities for her. She was being presented with more and more choices at precisely the time she was trying to limit herself. Kathy did not have trouble generating ideas, in fact she admitted that she generated too many at times. Her experience generating ideas may reflect the writings of Graves, discussed in chapter two. In addition, her expressed desire to get on with the business of organizing the goals of her paper may contain elements of the findings of Flower described in chapter one.

Three Ways Of Seeing may have prolonged and complicated what, for Kathy turned out to be the shortest stage in the entire process: generating an idea that could be developed. Like Annie, who had decided on her chronological organizational pattern and did not accept the complication Wayne's map provided, but adapted it to her goals, Kathy had already decided on her topic and stance by this point, and did not accept the complication offered by this activity.

The other activity Kathy tried in this subsection is called Audience. In this activity students are asked a series of questions about their topic and their intended audience. Kathy had trouble with this activity. She knew

her essay would be read by others in her group, and by me, but apparently she had never thought as specifically about her audience as the activity asked her to do. She mentioned questions such as "What's the best thing to be said about your readers," and "How does your audience feel about your subject" as being troublesome. Eventually she concluded that to answer these questions she would have to go back and ask them to her group. Kathy mentioned this activity was only useful in a classroom setting when the writer and reader were in close proximity. Beyond that, and in most realistic writing situations according to Kathy, the writer must make assumptions.

When I asked Kathy how she dealt with the issue of audience herself, she told me that she assumed her readers would be like her in most respects, but she "imagined they didn't agree with my conclusion" for this particular assignment. Kathy, was in a secretarial training program and she had worked in offices in the past. Her global conceptions of audience had apparently worked well for her in before and she indicated that she saw no need to dig any further into who was reading what she wrote.

From what Kathy indicated, I got the impression that she knew there were readers and she made adjustments for them in her own fashion. She did not see the value of a closer study of the reader though, just as Annie did not see that a closer study of the reader maps could produce some qualitative differences in her work.

The last activity Kathy tried in this subsection was called Connections. In this activity the student lists from seven to 20 phrases that relate to the topic. The machine duplicates this list and the two lists are placed side by side on the screen and "spun" so that random connections are made between the phrases. The point of the activity, according to the manual, is "to help students examine connections they might otherwise ignore." Kathy found this exercise to be "complicated" and "no help for me." I saw similarities between this activity and "Three Ways Of Seeing." The purpose of both is to broaden the options the writer has in terms of approach to the topic. Like Donald, Kathy was not averse to changing directions as she developed the work, but as long as she felt she was making progress she apparently did not feel the need to confound the issue by bringing in, what was, she indicated, extrinsic issues.

THE COMPUTER AS TEMPLATE

The last subsection in the Prewriting group is called Organize and contains eight activities. Kathy found this subsection to be the most helpful of the entire package. The first activity Kathy tried was Debating an Issue. According to the manual it "is designed to help students...by having them list all they know about both sides of an argument." The machine keeps track of the number of items in each list and prompts the students to keep the lists similar in length. Kathy went through the exercise using her teen pregnancy thesis. She wrote three

statements that supported her argument and three that did not. In a notebook that she kept to record her reactions to the exercises she wrote, "The program then told me that my opposing points were now listed first and supporting points were last because they were in a stronger location. Most people remember what they read last. Each opinion can be used as a topic sentence of a paragraph."

Kathy appreciated the organizational tips the machine provided more than the actual exercise itself. Her final essay reflected the organizational structure suggested by the computer. This type of advice appears to be exactly what Kathy was looking for. She mentioned in an interview that she did not feel it was difficult to come up with opposing points to her argument because she had been talking to members of her group and also doing some statistical research in the library.

At first I was concerned that Kathy seemed so willing to accept what the computer suggested, but in talking to her as her paper developed I began to get a better sense of what her priorities really were. Kathy's first concern in this paper was content. The time she did not spend in the computer room was spent in the library researching the issue. In fact, her final paper contains a great deal of statistical support for her position. She had been a pregnant teen herself, and had several friends who were pregnant as teenagers. Perhaps that contributed to the ease with which she relinquished the organizational decisions

about her paper to the computer so that she could concentrate on the content.

Like Shirley, who had strong feelings about writing and discovered statements that reflected those feelings for her cluster, or Donald, who knew he wanted to write about Moses, but had to search out how he wanted to say it, or even Annie who believed her essay was constructed chronologically and was unwilling to let Wayne's map go until she could interpret it that way, Kathy appears to have made some non-negotiable decisions about her essay, and some about which she was willing to be influenced. To refer again to Piaget, discussed by Petrie in chapter one, it appeared Kathy was willing to assimilate new information into the structure of her paper, but she did not appear willing to make accommodations in the structure itself.

Structure Guide was the name of the next activity Kathy used. This activity "supplies standard templates or outlines for major reports" according to the manual. The student chooses a format such as "General scientific paper," or "History report" and the computer provides some formulaic information about that type of writing. Kathy had a little trouble deciding in which category to place her essay, finally settling on "Sociology Report." The information provided by the computer was general and did not seem to fit very closely with Kathy's idea of what her essay was like. She looked through some of the other formats and commented

in her journal that, even though it was not much help to her "it looks to be a great help in class reports."

Apparently Kathy was attracted to specific types of advice such as that given her in the Debating an Issue activity. The comments about sociological reports were general and not attached to any one topic. It seemed Kathy was not just window shopping through the software. She had an idea of what she wanted, and that was specific advice that related to the goals she had set out for this assignment. While she appeared open minded enough to see how some elements of the software may be helpful in other settings, she has no interest in pursuing them. The work was before her and her attention was focused on getting through it as quickly and with the least amount of disruption to her plan as she could manage.

The next activity Kathy used in this subsection was Developing a Paragraph. According to the manual "The activity is based on one model for paragraph construction-a two part paragraph with an initial assertion, followed by several sentences of support or explanation." The student can choose between descriptive and argumentative paragraph formats. Kathy chose argumentative, and described the activity this way: "I liked this. I typed in 6 sentences. Program put them altogether for me in a paragraph." Kathy was a competent enough writer that her paragraphs did become more specific as they developed. The computer made no

distinction about the six sentences, it merely put them together in paragraph form.

There is a tutorial before the exercise that discusses the purpose and structure of argumentative paragraphs, but it presupposes a level of familiarity with paragraph form. Kathy did not use this activity to help with every paragraph in her essay and she did evaluate the computer's organizational decisions, eventually changing the order of sentences in a paragraph. In actual fact though, Kathy was evaluating her own decisions because the computer merely created a paragraph from the list of sentences she provided. I mentioned this to her one time and she agreed, but still liked the idea that the computer allowed her to work with the arrangement of sentence size chunks of essay after they were originally installed in the work.

Like the maps Donald made on his way to understanding what it was he wanted to say about Moses, Kathy appreciated the fact that when revisions were necessary they could be done with a minimum of effort and no loss of ground. She mentioned that sometimes revision "depressed" her because she had the feeling she was starting all over again with her essay. She liked the fact that she could deal with larger units of text on the computer and that there was no commitment on her part to a particular way of writing something as there was when she wrote on paper. Kathy's use of the word "chunks" reflects the thought of psycholinguists such as Ney, discussed in chapter one. Perhaps the computer

enabled Kathy to make better use of her short term memory by allowing her to increase the efficiency with which she processed data.

The last activity Kathy tried in the Prewriting section was Five Paragraph Theme. As the name implies, this is an activity in which "Students start with an introductory paragraph which contains a thesis statement, follow with three paragraphs which prove or describe the thesis and end with a one paragraph conclusion." Although Kathy's essay ended up containing 11 paragraphs, this was the activity from which, according to her, she got the most benefit. "It was the most useful to me," she wrote, "I supplied the subject, answered some questions, typed in the sentences and was amazed at the results. The computer wrote my paragraphs for me using my sentences." The machine prompted Kathy with some general questions such as "What is your subject, Describe the importance of [your subject], and who is your audience," accepted whatever she responded with, and incorporated that into the work.

The computer would not let her move to the next step of the activity until she had completed the step she was on, and it wanted all responses to be in complete sentences which it then organized into paragraph form. Kathy was a strong enough writer to respond appropriately to the questions and, by this point she had done more background research on her topic, so she had some statistical information to supplement her views and ideas. This

activity did occasion a little difficulty for Kathy as she was not always ready with three responses to the prompts. For some of her topics she had two, for some four or five support sentences, so she felt limited by the unyielding nature of the structure.

I noticed that in the final paper she added in support to those sections where she had more than three ideas, but she also left in the responses she had made to sections where she was forced to come up with more support than she had available in her plan. This tended to give her paper an uneven feel in terms of the priority of information she presented, and, since the sentences were generated in isolation from the essay as a whole, some of her transitions were weak, or missing altogether. Kathy was aware of this after the fact, but she had not noticed it during the process. As with the other organizational activities Kathy appeared to let the machine do the work for her. This time, however she was not totally satisfied with the result and did retake control of some aspects of the process.

Her final draft still had 11 paragraphs and some work had been done on transitions. I got the distinct impression from Kathy, that she felt the computer was taking over some of the "grunt work" of writing and enabling her to concentrate on what she felt were more important things. Perhaps, with reference to the work of Shaughnessy among others, Kathy fit the profile of a good writer by focusing on the global issues. Perhaps the machine allowed her to

focus on these elements to the detriment of the other aspect of her essay.

THE COMPUTER AS LAWGIVER

The second section of Writer's Helper is called Revising and also contains three subsections: Structure, Audience and Checks, each containing between three and nine activities. The emphases in this section are highly mechanical and syntactical in nature. Under Structure, for instance, one of the activities is Subordinate Clauses; under Audience, To Be Verbs; and under Checks, Homonyms. Kathy was a strong writer in these areas and her essays were generally free of mechanical and syntactical errors. Nevertheless she went through some of these activities. Aside from the novelty of listing her prepositions, or readability index, she saw little useful for her in these exercises. She mentioned in her journal that she thought this section would be more helpful to writers in the first English class. I think that because she was familiar with word processing softwares previous to using Writer's Helper, she may have preferred the spell checker and grammar checker used in those softwares. I also got the impression from her that this section may have told her more than she wanted to know about the structure of her writing. She indicated that she was satisfied with her paper at this point and did not see how a close study of these aspects of her writing would be useful to her.

I found some interesting parallels between Kathy's experience with Writer's Helper and the experiences of the whole class with other spatial visualizations. For example, in the class I found that the time of open brainstorming was relatively short, and immediately following it came narrowing types of decisions. Even students who were not certain of their topic when they began clustering did not spend a large amount of time generating ideas. Most time was spent on organizing those ideas from rough decisions about order to final thoughts about degree of detail. It was not unusual for one of my students to spend five or ten minutes generating a cluster, then spend several class periods organizing it. To the best of my knowledge, no student spent more than 30 minutes in the clustering phase of composing, and most spent less than 15.

There was another parallel between the activities of the class and the experiences Kathy had with the software, and that was in the area of free writing. All of the students in the class had been exposed to free writing prior to the study, and we practiced some free writing activities throughout the term as one example of ways to approach a topic. I noticed as the term progressed, however, that my students seemed to prefer clustering to free writing. I did not notice this as it happened and it was not until after the term was over and I was looking over Kathy's comments about an activity in the Prewriting section called Brainstorming that I saw the pattern. Brainstorming is

essentially a free writing activity. In this activity Kathy was allowed to write quickly about anything she could. The computer did not allow her to go back and, if she paused for too long it cued her to start writing again. Kathy mentioned that, while it would be useful on occasion, she much preferred Association and Questioner because they were "easier" and she could "write quite a few papers using these topics."

Clustering is a non-linear form of free writing, stripped of the need for any traditional structure. Flower and Shaughnessy, among others, have written about how basic writers focus on mechanical, or local aspects of writing rather than global ones. It would seem that, even in a free writing situation, those attitudes could come into play. Clustering and, to a lesser degree, the activities Associations and Questioning, remove the possibility of focusing on these attributes because of their non-syntactical approach to idea generation.

COMPUTERS AND "PRODUCTIVITY"

The second software I exposed the students to was ThinkTank which is not designed specifically for writing. The manual describes it as a "productivity tool that helps you plan and manage the daily routine of your work...For example, you can use ThinkTank's powerful idea processing to create, edit and rearrange the action items on your 'To Do' lists...You can write most of your ideas, notes and memos in ThinkTank documents." It is these attributes which most

lend themselves to composition. Even though ThinkTank uses a basic Harvard outline format, its flexibility in terms of movement of ideas, and restructuring of what has been written, is similar to other visualization techniques. In addition, the students using ThinkTank could essentially grow one map from another and, by saving their work, or printing it out along the way, maintain a reference of previous work. ThinkTank is much more focused than Writer's Helper; however, in that it only provides an outlining function. In the end, students had to go to another wordprocessing software to write their papers. They could, of course, take their maps with them, but even if they did write in sentences on the outline, ThinkTank did not create their paragraphs for them as "Writer's Helper" had.

ThinkTank was a little more complicated to use. Like Writer's Helper it was menu driven, but lacked the easily accessed help tutorials. It also required a little more background computer knowledge on the part of the user than Writer's Helper; however, the students who completed an exercise on it found that they only used certain aspects of the program, and did not need to learn all of its commands. Some of the functions, such as certain templates that dealt with names and addresses, or project time lines, did not lend themselves to what the students were trying to do, so no attention was given to them. All in all, I believe that the students used about 30%-40% of the capabilities of the software.

It took students anywhere from two to four hours of practicing before they felt comfortable enough to try and use ThinkTank in developing a paper of their own. The higher level of complexity, coupled with the fact that only one format, the standard vertical outline, was available, may have contributed to the fact that only three students worked through the software to the point where they had created a usable map from which they developed an essay. One of these three students later abandoned the ThinkTank outline in favor of a hand drawn map. The map he created, often using material from the ThinkTank outline, was what grew to be the standard hierarchical top down type of map. I asked him if he preferred one or the other type of map and he said he did not have a strong preference, but liked his a little better because it "spread out" on the page more and he could "see" it better. By this I think he meant that the ThinkTank outline is a vertical line down the page with points and subpoints underneath one another, but this student's map was more like a wiring diagram in shape, with the three major subpoints arranged horizontally across the page underneath the major point which was at the top center of the paper.

The student I will focus my description on is Daniel Auschlander, a Business Management major in his second year. He is an adult student, Vietnam veteran, and owner, with his brother, of a small family business. Daniel enjoyed writing and often wrote extra credit papers and projects in his

other classes. His writing was generally clear, but he did suffer from some mechanical problems, most notably spelling. Soon after coming to my institution he took one of the wordprocessing classes and learned to use the spelling checker as well as the software, and did almost all of his papers on the computer. He was very familiar with the computer both as a wordprocessor and as a business tool, having taken computerized accounting and database management classes as well. This familiarity, coupled with his own natural interest in the machines, probably contributed to his completion of the project. Daniel was familiar with ThinkTank before he did his paper on it, having done several of the familiarization exercises and studied the manual for quite some time prior to beginning. In fact, he withheld his acceptance of my invitation to participate until he had the time to study the manual and the software on his own.

The other students, who did not finish a project using ThinkTank, told me that they stopped because they thought the software too complicated, or it was just "easier" to do the mapping by hand. One student in particular commented that he had not liked outlining in high school and saw no reason to like it now just because he was "doing it on a computer instead of in [his] notebook."

The paper Daniel chose to do using ThinkTank was based around the development of a fictitious business called "Kollege Klothes Shop." It contained fifteen major sections on the financing, staffing and supplying and marketing of

the enterprise as well as an introductory citation. Daniel felt that, using the major headings as sections in his outline, he could better organize the minor points under them, and thus would not "forget" any. After some initial difficulty getting started, he began to enter his major and minor points. I noticed at one session that he was working from a set of notes. I asked him if he had previously organized his information and he replied that he had. I asked him what use the computer was if he had already done the outline on paper. He replied that it was good for him to do the "prep work" on paper, then enter it into the program. After he had done that, he could go back through the outline and put in "later thoughts." It appeared that Daniel was using the software to polish, rather than create his essay's organization. I asked how he came up with later thoughts and he replied that he would look through each major section of the outline and ask himself if he had anything more to say.

This approach was particularly evident in a section titled "Personnel Policies Recommended For Kollege Klothes," which grew from just "Training and Development" in Daniel's notes to "Training," "Development," "Compensation," "Benefits," "Interviewing Techniques," "Recruiting," "Development of a comprehensive management plan to utilize human resources," "Internships," "State and Federal Laws regarding hiring/firing," "The rights of the individual," and "Federal statistics that relate to the personnel issue."

Here Daniel was using the entered sections as a prompt for more of a clustering activity. By focusing on the informational phrases he entered under each major point of his essay and trying to generate more ideas he was revisiting the idea generation stage of the compositional process. Daniel appeared to be exhibiting the progressive recursive nature of the writing process.

As with the other types of spatial visualization, the computer acted as a record keeper, so that Daniel's later attempts at invention could build upon what had gone before, rather than begun again after the initial track had been lost in a flood of competing and conflicting ideas. Like Kathy, Daniel came to the sessions apparently having made certain decisions, and with certain goals in mind. Like Annie, Daniel had decided on the basic outline of his essay and his primary concern appeared to be fitting new information into the cast he had chosen. In fact, most of Daniel's comments, both written and verbal, centered around the program's ability to help him with the placement of his ideas and the development of the project in general. This fits with the overall design of ThinkTank, in that it bills itself as an organizer and planner rather than an idea generator.

On several occasions, however, Daniel used the program for more than organization. In one session particularly, I listened as he went through a verbal protocol using the previously entered information "Credit Selling and Financial

Plans" as a base. Several times he would ask himself if "That's where I want that," but he seemed to spend more time wondering aloud if, "That's all I want there." Often, even though I had asked him to think out loud, he would pause and look silently at the screen. When I asked him what he was thinking about, his answers inevitably centered around the addition of points. He wondered at one juncture if he should include an explanation of federal laws on credit card sales. Eventually he decided to just include a copy of the laws. It appeared to me that Daniel was dealing with large rhetorical issues similar to those described by Flower in "The Pregnant Pause: An Inquiry Into The Nature Of Planning," discussed in chapter one.

ThinkTank allows the user to change not only the length of the outline but the relative importance of the elements within it as well. On five or six occasions, after Daniel had added a piece of information he would change the relationship between the various elements in that particular section as well. For instance, as he was finishing up the section on "Break Even Analysis" the need for visual aids occurred to him. As he thought about the aids he would need it became evident that, due to the heavy statistical nature of that section, it would be easier to rely on them rather than use them as adjuncts to the narrative. Eventually he moved visual aids to the top position in the outline and renamed the section "Break Even Charts." Daniel mentioned that as he added new points and subpoints he also "saw" new

relationships between them and his previously entered information. I asked him what part the program played in this and he said that the outline format could let him see the "essentials" without the "clutter" of full sentences. In fact that comment was the basis of Daniel's overall favorable opinion about the software. Like Kathy, who had already decided on her topic, Daniel also appeared to be searching for ways to improve. The foundational decisions about his essay had already been made and, even though he returned to invention as he went through the outline, the overriding concern appeared to be with placing new information into his organizational format.

Daniel spent approximately three hours with ThinkTank before he decided the outline was completed enough to print out and take to the wordprocessor to use as a guide in writing his essay. Most of that time was taken up with viewing the entered information and deciding if "there was anything missing." The next largest chunk of time was taken up with rearranging the information based on new relationships. Actually putting information in, once initial difficulties with the software were overcome, comprised the least amount of time. All in all Daniel was satisfied that the software increased his "efficiency," but I wonder how much use it would have been had he not made a great many decisions before approaching it.

Daniel did not return to ThinkTank after he printed out his adjusted outline, although he did make more changes. He

showed me the copy of the outline he printed out and there were several arrows written on it moving information up or down a level as well as a few notes to himself, and even scratch outs of some subpoints listed previously. Daniel admitted he was "thinking right up to the end" and even moved some information after he had entered it into the wordprocessor.

Perhaps the fluid nature of the composition process is more suited to the ethereal nature of computer screens than the hard copy of ink and paper. Daniel seemed to think so. After the project was over he mentioned that he thought he would continue using the computer to "set up" his essay. He liked the idea that sentences were not necessary, but when I told him he could just as easily write his ideas on a piece of paper as type them into a computer he mentioned that computers are not "permanent." He felt that, even if he could train himself to "Write like I type" it would not be the same as watching his thoughts fill a computer screen.

In the next chapter I will discuss, in a little more detail, my views on the implications of what has occurred here, but, it certainly appears that, at the very least, spatial visualization, whether it be on paper or electronic, has a part to play in liberating the students from what they view as the limits of the printed page, and the commitment it takes to place words, in order, upon it.

CHAPTER FIVE: INDICATIONS

I call this chapter indications rather than conclusions, and mean that term to be taken in its medical sense of pointing the way towards diagnosis.⁵⁵ Like the specialist my view is essentially vertical. I have looked into one particular instance, and offer my opinions based on that experience. To be completely meaningful, this study must be viewed as a part of the total system in which students become writers. Its usefulness will be shown in its relation to other elements in that system, and its meaning will further unfold as it takes a place in the process of turning individual indications into wholistic diagnoses. In that sense this chapter does not close the study, but begins it.

As I read over the material I collected throughout the class, I was reminded of the term physicists use to describe mathematical relationships among the differing aspects of the universe: elegance. I believe that term is applicable to the relationship between the writer and the written. I tried to be as inclusive as possible in my study, but I could see that for every element on which my attention was focused, there were others that played at the edge of awareness. Those shapes, at times only dimly perceived,

55. I am not implying that I view the writing of my students as unhealthy. I intend the term diagnosis to be taken in its complete medical sense. For example, good lung sounds and a strong heart beat can be indications leading to a diagnosis of wellness.

coupled with the aspects of the process on which I was able to focus, have given me an inkling of the tremendous interplay of harmonies and discords that result in meaningful marks on a page.

Speaking from an instructor's standpoint, increasing the visibility of here-to-fore unseen elements of writing through spatial visualizations, allowed me to reduce my own visibility. I found that maps let me get out of the way and increased the potential for discovery as my students worked through the process. In a sense, the students created their own text as they went through the class. This text not only included models, which were the end product of their labors, but also a record of the steps they went through in the creation of discourse. What the students turned in at the end of the term reflected their own personal journey towards an understanding of what it means to capture ideas on paper.

The study identified two major currents which I will use as organizing principals for this chapter. The first, global current, was the one in which students tried to find meaning in the total environment of the class. Through a mixture of the familiar and not so familiar, their own past and their shared experiences, they understood their way through the second English course they were required to take at my institution. The second, local current, was the one in which they tried to incorporate spatial visualization techniques into their repertoire of usable skills. This was the focus of the study, but it should not be discussed in

isolation. A universe of meaning was created in my class, and any element of the universe should be described both for what it is, and placed in its proper relation to other aspects of its environment.

From a global standpoint it appears the maps helped students focus their attention in more inclusive areas. Also, they appeared to be able to open two way lines of communication with their readers. The results of that communication were an increase in confidence on the part of the writer, a broadening of the sense of what writing is and an increase in the pool of available ideas for invention and composition.

It is possible to discuss the maps in isolation, if it is kept in mind that this is an academic exercise. Like the experimenter who goes into the lab and mixes two chemicals together to see what happens, I attempted to strip away context and observe the naked elements of mapping. I discovered that maps identify ideas, put those ideas in order and reflect how that order is perceived.

Maps that identified ideas were called clusters in my study. I was reminded of how a crystal grows as I watched the students' clusters take shape on the page, spreading, branching, eventually covering almost an entire sheet, and each branch containing the germ of an idea. Just getting started was, at times the most daunting part of the composition process for my students. Few things, to hear my

students tell, were more intimidating than that massive, empty, blank sheet of paper. To meet this challenge, my students used clusters as an undifferentiated, non-linear form of free writing. Of all the mapping techniques we studied, this was the one I feel most closely fit the needs my students had while generating ideas. They told me it took the pressure off and allowed for concentration on ideas. Clustering cut my students' internal editor out of the loop most efficiently, it appeared to me, and made it possible for them to excuse themselves from grammatical and structural concerns. With clusters I feel my students were able to maintain control over the often furious aspects of idea generation. Later, their clusters could be studied as an approach vehicle for the subsequent stages of the composing process.

I had intended clustering to be a part of a larger strategy for dealing with the problems caused by the composition process. My students, however, no matter what their reaction to the other elements of the class, took to clustering most wholeheartedly, and, if their comments in journals and interviews are to be believed, made it the single most appreciated and useful element of the term. To put my students' responses in a way more reflective of researchers like Flower and Shaughnessy, it seems clustering allowed even my basic writers to concern themselves with global issues.

"Clusters get the ball rolling," as one student said. In chapter three I wrote about Shirley Daniels whose experience with clustering underscores that function. Ironically, even though the part they played in the composing process was the shortest, often lasting only a few minutes, clusters were the most enthusiastically received of the spatial visualization techniques. Shirley, for example, appreciated clustering as much as she did because, according to her, it removed what had been a helpless feeling about the beginning stages of writing. She told me that learning to cluster made the whole course worthwhile. I believe clustering may have filled a gap in the way she approached the process of writing, by allowing her an avenue for the internal development of ideas. It returned some control of the process to her, which validated her as the meaning maker.

Because she was very concerned with her grade, she wanted to please the teacher, yet, something bothered her about what she had to do to earn that approbation. In many ways, she reminded me of the dilemma described by Elbow in the chapter of WRITING WITH POWER devoted to having a teacher for an audience. She was not committed to her writing, and felt resentful towards teachers. Clustering allowed her to make a compromise between her own needs to feel a part of what she was doing, and her desire to get good grades. Of course Shirley's life was not turned around by clustering, and I suspect her feelings about writing in

general remained substantially intact, but the almost palpable sense of relief that infused her journals and conversations about clustering could not be overlooked.

Clustering also helped students like Shirley with putting words to their feelings. Shirley had a very strong opinion about the negative aspects of writing and the clustering exercise she initiated her paper with allowed her to put words to it. It appeared to me that clustering allowed for a boiling away of many of the layers of the composing process, leaving thought and emotion clarified. This enabled Shirley to begin at the ground level, rather than building on air. In my view, clustering's main assistance is in the performance of this purifying function.

The next phase of the mapping strategy concerned the organizational maps. These maps carried on the process started by clusters, but shifted the emphasis from generation to placement of selected ideas. These maps allowed my students to make decisions about the essay, and I think, made them more efficient in terms of where they concentrated their effort. The students could do more than develop a shopping list of the details that would appear in the essay, they could visualize the relationship those details had to one another, and to the overall goal of the essay. In this regard my students could reflect the concern with global issues in a manner similar to proficient writers described by Flower. For my students, organizational maps turned out to be some variant of hierarchical maps, either

top down, or left to right. I intended these maps to remove the need, even the opportunity, of focusing on syntactic form, and place the writer's attention on global issues concerned with the development of relationships between individual ideas. Judging from my students' reactions, I think that is what happened in the class. They seemed to appreciate the freedom provided by the maps. Even those who had experience with outlining told me they appreciated the idea that organizational decisions need not be completed before committing pencil to paper, but could be developed as the process grew.

Like teachers who are exposed to new methods and use those methods for a while in their classes, eventually falling back on old ones, my students were attracted to organizational mapping strategies, used them, but as the term developed I could see some were falling back on older organizational habits. My attempts to broaden their repertoire of mapping strategies was met with interest, and in exercise situations the students demonstrated the ability to vary their mapping techniques, but in actual compositional situations they returned to the hierarchical strategies, or drifted back to strategies they had brought into the class with them. From what the students told me, I got the impression that their attention was diverted by the organizational demands made on them and, if they did not stop to remind themselves that they had a new tool, they may have reached for one of the old ones. I did not get the

feeling, however, that the students saw no value in the organizational maps.⁵⁵

Looking at the information I collected in this area as a whole, it appears the organizational maps provided a way to keep their attention focused in useful areas. They helped my students make decisions between alternatives that may have previously led to a further complication of the composing process rather than a clearer vision.

Donald Westfall, for example, organized and discovered at the same time, through the use of the maps. His journey through the process of composing a paper about Moses shows how hierarchical maps can point and suggest at the same time. Donald's map made it possible for him to develop a complicated paper, but also enabled that paper to shift, change and grow with him as he came to new discoveries of what he wanted to say. As his paper grew it begins to take on a life of its own. A life that was not always what he intended. Donald's story took many turns and twists as it developed, yet he felt he was helped in making his way through by the maps. His map provided a visual history of the intellectual and emotional journey he took. As his first map went down the page, it began to grow and spread. The second map did the same, even turning back upwards at

55. The idea that the students were just composing my way because I was the teacher and I told them to, was never far from my thoughts. I think that they honestly did see value in the mapping strategies, because the students often suggested mapping ideas without my input, and, even though the study is over, students have mentioned to me that they use the strategies in their other classes.

the bottom of the page and finally coming to rest where it started, with the author's "thoughts." In between "A talk with Moses" and "my thoughts" is a hurricane, or perhaps more appropriately, a desert sandstorm. Through it all, I believe the map guided and suggested to Donald by turning his thoughts back on himself. The map functioned, literally, as a map, but with a difference, because Donald was charting his course as he went. The territory was unknown and the path unseen, but Donald was able to traverse the land by using the map to keep in touch with his own internal compass. He truly did navigate by his own lights.

I believe the concept of navigation is a central metaphor in the process of understanding how the maps functioned. They were an outward representation of an inward journey each student writer took. Because of their flexibility, they could keep the writer on course, even when that course was constantly changing. Additionally, like the proverbial breadcrumb trail, they provided a record of where the writer had been, thus making backtracking possible.

At my institution, the type of writing students are trained to do is primarily for work related, professional purposes. As such it is public writing, created with often a very specific audience in mind. The reader is always right could be a slogan in these types of courses. I saw the reader maps as a way of visualizing to the students the effects their compositional decisions had on the audience.

The students indicated to me that the maps done by the reader allowed for midcourse corrections as the essay grew into the standard forms. By making a map, the reader responded as an actual reader, without the added pressure of being an editor. Elbow discusses the importance of having a realistic audience in WRITING WITH POWER and determines that one of the attributes that keeps teachers from being authentic audiences is their role as evaluators. Since there were no right or wrong maps, the writer could study maps done by the reader for indications as to how the essay was being perceived, instead of how it appeared to fit a standard form. At times my students told me this was as simple as the comparison contrast exercises done in basic writing classes. At other times, the process was somewhat more complicated.

I am reminded once again of the work of Flower, Shaughnessy, and others, who explored the way students solve the rhetorical problem. What my students had before them in a reader's map was a record of the reader's response to the work. In their own maps, or in their heads, they carried an idea of what they wanted to accomplish. Placing the two sources of information side by side enabled my students to go through a comparison contrast procedure and thereby identify the global elements of the essay that needed work. Once that was done, revision became a matter of enlarging sections that the reader did not pay enough attention to, or

reducing sections to which the reader gave too much importance.

The students in my study accomplished this by looking into three areas of the reader's map. Initially, they compared the quantity of detail by seeking the points of their essay in the reader's map. The writer who had three major points to discuss and gave an example of each would expect to see that reflected in the reader's map. As one student, who was a computer major, wrote in his journal: [at this point the writer says] "if yes go to step two. If no go to revision."

After the quantity of information the reader responded to has been determined, my students next looked at the quality of that response. If a major point was illustrated with a analogy, for instance, did the reader see the analogy, or only the major point? It is at this level that my students were trying to move their readers from mere recognition of the subject, to understanding. They were trying to reduce the area of interpretation that makes up the realm of abstract ideas by providing example, narratives, analogies and the like, that tied their abstract points down into actualities of experience. Again the revision procedure is, if yes, go on, if no, revise.

Finally, my students looked for priorities in the reader's map. Whether the map is top down, or left right, or some other organizational structure, its priorities should represent those of the writer. As with the other two

aspects of reader map reading, the strategy for revision is the same, make the priorities more visible, or less visible depending on the situation. Reflecting the work of Flower, I feel the reader maps gave my students a tool to move from being writer based writers to reader based writers, by allowing them to see where the needs of the reader were being met, and where they were not.

In my view, this aspect of reader map's performance is most important because it allows for the timely visualization of relationships among the elements of the essay. This is an area that, previously, may have only existed in conversations, or in teacher notes after the essay was completed. My students were able to see the abstract relationships among their ideas, and how those relationships were being perceived by a reader, before the essay is completed and when they still had time to adjust the work to come into closer compliance with their goals. The students indicated to me that reader maps provided the writer and reader with a basis for conversation.

The directions this conversation took were several. Some saw it as a confirming or confidence building exchange, some saw it as an idea exchange, some participated in both aspects. Even students who had never thought much about their audience before, those who fit the profile of writer based writers, developed an awareness of the reader. Listening to these students, and reading their journals indicated to me that writers in this category used the

reader as a confirmation of sorts. These students could use the reader to reduce their own level of doubt about how their writing was perceived. The reader, for them, became a confidence builder in many instances, demonstrating to the students that they were better writers than they at first assumed, or that they were as good as they had suspected, but could not make themselves believe. For these students, the reader broadened the definition of writing beyond constricted, often mechanistic boundaries and made them aware of what they could do as writers rather than what they could not do.

This was sometimes a stressful awareness, as the students told it, because writers who were not sure of their capabilities in the narrow sense in which they had thought of writing before, now had to deal with new elements in the process. When the term was over, however, even my students in this category talked of accepting the reader as part of the process, and most appeared to me to have learned to use reader input to structure the priorities of their work.

The students who used the reader maps as a source of ideas were the ones, it seemed to me, that developed the clearest sense of community within the groups. I noticed that these students were better able to handle criticism of their work as the term progressed. I feel this way because they were the students I observed actually seeking criticism out among their group members, rather than waiting and responding as other students did. My own notebook contains

several entries in which I recorded my surprise and pleasure that these students seemed to be directing their attention to improving the work, rather than improving the grade. At one point I wrote that they seemed to be becoming less and less students, and more and more writers.

The reader maps helped engender commitment among the students. They were interpreted by writers according to their own internal priorities. Once my students had gone through the composing process and produced a draft, their loyalty to that essay was almost total. Reader maps were often viewed with suspicion until a way could be found to fit them into the flow of the essay. The stronger the writers held a particular view of their essays, the less willing they were to accept the reader's comments without a fight. On the other hand, the readers felt a certain loyalty to the response they had as well, and often were not willing to accept the writer's accusation that they had simply missed the point. It was very important to Annie, for instance, that her essay be seen as a narrative, written chronologically. She was not able to proceed with her interpretation of Wayne's map until she could find a way to fit it into that system. Annie eventually did fit Wayne's map into her system, as the other students did with varying degrees of difficulty. For writers, mapping helped to produce a topic they owned. For readers, mapping visualized a personal response.

Even with closeness of the classroom in which Wayne and Annie worked, and even though they both shared similar experiences, Wayne still produced a map that surprised, dismayed and delighted Annie. He produced a personal response even though he was familiar with the big picture about which Annie wrote. Because it was personal, he defended it and in so doing precipitated conversation between the writer and the reader about the work. Through conversation, it seemed to them that the elements of the composing process became clearer. By helping each other through the composing process they traded roles as guide and guided. The result was that both became more familiar with the ways from idea to essay.

It seems to me that, by fostering a climate of conversation, maps contribute to the realization that meaning is constructed by the students. This is a foundational realization according to the work of writers such as Berthoff and Linn, among others.

Many of the authors discussed in chapter one, most notably Berthoff and Embler, described the linkage of control and confidence. At one time or another, every writer in the class made mention of a growth in their feelings of confidence. Even students who remained apprehensive about aspects of the class, such as the presence of the reader, found other aspects to be positive in nature, such as the clustering. Some made confidence a theme for the term and returned to it again and again.

Through the journals, conversations and my observations, I was able to track the growth of my students' sense of control over their essays as the term progressed. Of course, this growth is not something I can relate only to the spatial visualization techniques. The role of peer groups in fostering this sense of ability in my writers cannot be ignored. In fact, my whole strategy of reader mapping rests on the assumption of group activities, and as such, it is often difficult to tell which experience has a greater effect on my student writers: the map, or the group in which that map was created. The most plausible answer is probably both. The elegance of the process by which writing occurs is such that no single aspect is unaffected by the others. Like peer groups, or drafts, I think spatial visualizations are another voice in the choir. It seems to me that what they provided my students, like the peer groups, or any of the other singular techniques, is another potential source of useful information for the writer, which, when taken with other sources of information can produce a decision that, potentially, leads to positive action.

My students were excited by the fact that they could see what had only been discussed in other writing classes. They could see the growth of their own ideas, and the evolving shape those ideas were taking; they could see the reaction of the reader; and they could hold these aspects as

time passed and filter ⁵⁶ them into the essay at a rate they controlled.

In summary, the different types of visualizations performed different functions. The clusters operated as beacons, helping my students to identify the outlines of their ideas, and the feelings that went along with them. They gave the students a picture of what they wished to write about, both from an intellectual and emotional standpoint.

Organizational maps allowed for the ordering of ideas and the addition of standard forms in a fashion that kept the writer in control. They also carried on the discovery process started by clusters by further sharpening the students' view of their topic and its environment. Their visual nature allowed my students to set aside elements of the essay that were firm, and focus attention on those areas still in flux. As such, I believe the students became more efficient in terms of how their time was managed during the writing process.

The reader maps allowed the reader timely entrance to the transaction. They engendered conversation about a work in progress that made the decisions by the writer more realistic and efficient. In addition, they took some of the loneliness out of the process, and helped to make the

⁵⁶ I chose that word as a direct reference to Black, discussed in chapter one. From what the students indicated to me, it appeared they were using the maps as a filter through which they passed not only the reader's reaction, but the shifting ways in which they saw the essay as well.

students more aware that their are collaborative aspects to writing.

My view of the computer softwares was essentially that they operated as electronic spatial visualizations. In the classroom, maps were created by the students in response to a certain need during the composing process, likewise on the computer, no student went through every exercise just because they were there. Each student sought assistance from the computer based on a specific difficulty.

The experiences Kathy had as she worked her way through Writer's Helper Stage II was like that of a shopper in a market with a very specific list. As such, she responded to elements of the software that filled needs she had, and passed other aspects by. Her needs were primarily organizational and those were the exercises in which she found the most good. She was looking for help in making decisions, but the elements she was looking for all implied a preexisting set of priorities. The student's lament, "I know what I want to say, I just can't say it," is an accurate description of Kathy's attitude. She told me where she wanted her paper to go, but she was not sure how to get it there. The exercises she found most helpful were the ones that showed her the path leading in the direction she had already chosen. Writer's Helper was better than ThinkTank in this area because of its versatility. In addition to the variety of exercises for the different stages of the composing process, the various exercises could

be programmed by the teacher to give specific prompts that related to certain kinds of assignments. In this regard the software could become a very helpful adjunct to the writing classroom, almost like an electronic teacher's aid of sorts.

Writer's Helper is no panacea, however. The software made it easier for Kathy to make decisions about her work because of its flexibility, but that same ease could cause her to abandon her responsibilities and become a writing technician, rather than an author. It diverted Kathy's attention from elements of the essay such as transitions because it did all of the assembling of sentences. The software arranged whatever Kathy entered, without regard to how the overall flow of her essay was affected. Further, Writer's Helper Stage II assumed a certain level of familiarity with the forms of writing that may not be true of writers at all levels. I am not; however, against using computers in this fashion. Even though the computer organizes, it is only reflecting the decisions made by the user. Further, Kathy had made certain non-negotiable decisions concerning aspects of her essay that the computer could not change. There was authorship, in other words, and because of that I do not believe total authority would ever be given over to the machine. Kathy saw the computer as a way to take some of the "grunt work" out of writing. Perhaps she simply had a different conception than I do of where the line between meaningful work and grunt work exists.

The flexibility that made Writers' Helper so useful was ThinkTank's biggest drawback. ThinkTank was basically an electronic hierarchical mapping software, and that is how Daniel used it. As with the hand drawn organizational maps, it did function as a creative tool from time to time, but mostly he used it to organize the decisions he had previously made, then rearrange as he made new decisions. As with hand drawn maps, ThinkTank did help visualize Daniel's organizational decisions, and it enabled him to see relationships between ideas in his essay. ThinkTank functioned as a visualization of the context into which Daniel arranged his information. Maps, whether electronic or drawn, helped make elements of context visible to the students, and held these elements still while they adjusted other aspects.

My impression, after doing this study, is that students need information about how to negotiate the often vast and trackless area of abstract relationships that lies between idea and essay. Information that will allow them to initiate and control the decision making process is the goal of spatial visualizations, electronic and otherwise.

As an example, we may hold in our heads a map of how to drive to Cleveland without too much difficulty, but to simultaneously think of all the possible ways of getting to Cleveland from jet travel to walking would provide a great deal of difficulty. Yet, often that is what students are asked to do. The composing process contains too many

potential paths, not too few. The maps allowed students to turn the process inward and focus on their own strengths. It gave them a tool to work through difficulties by giving them what every decision maker needs more than anything else, useful information.

The indications are that maps can assist in making the students self sufficient. They give the students information that can help them diagnose their own difficulties and recommend a treatment. Spatial visualizations are no cure all, of course, and my students often preferred their own, occasionally destructive, habits to the new ones.

Writing is an action, and maps enable the students to act--to make progress through the composing process and to recognize that progress for what it is, decision making based on recognition of internal priorities about to go public. It is through a recognition of the relationships among the facts and feelings of the essay that students come to produce discourse. Maps allow the process to grow from within first, rather than being imposed from without. They assist in the negotiation every writer undertakes with his or her own internal priorities and the standard priorities and conventions we have agreed on as readable prose.

Throughout this dissertation I have referred to spatial visualizations as snapshots, anchors, and grab bars among other metaphors. It is fitting that this work should end on as symbolic a note as it began, because what the maps really

represent is a concretization of internal processes undergone by the author. Just as we tell the poetry student that the rose is not something else, but something more, so too are the maps more than visualizations of thought processes. They are the bones of writing.

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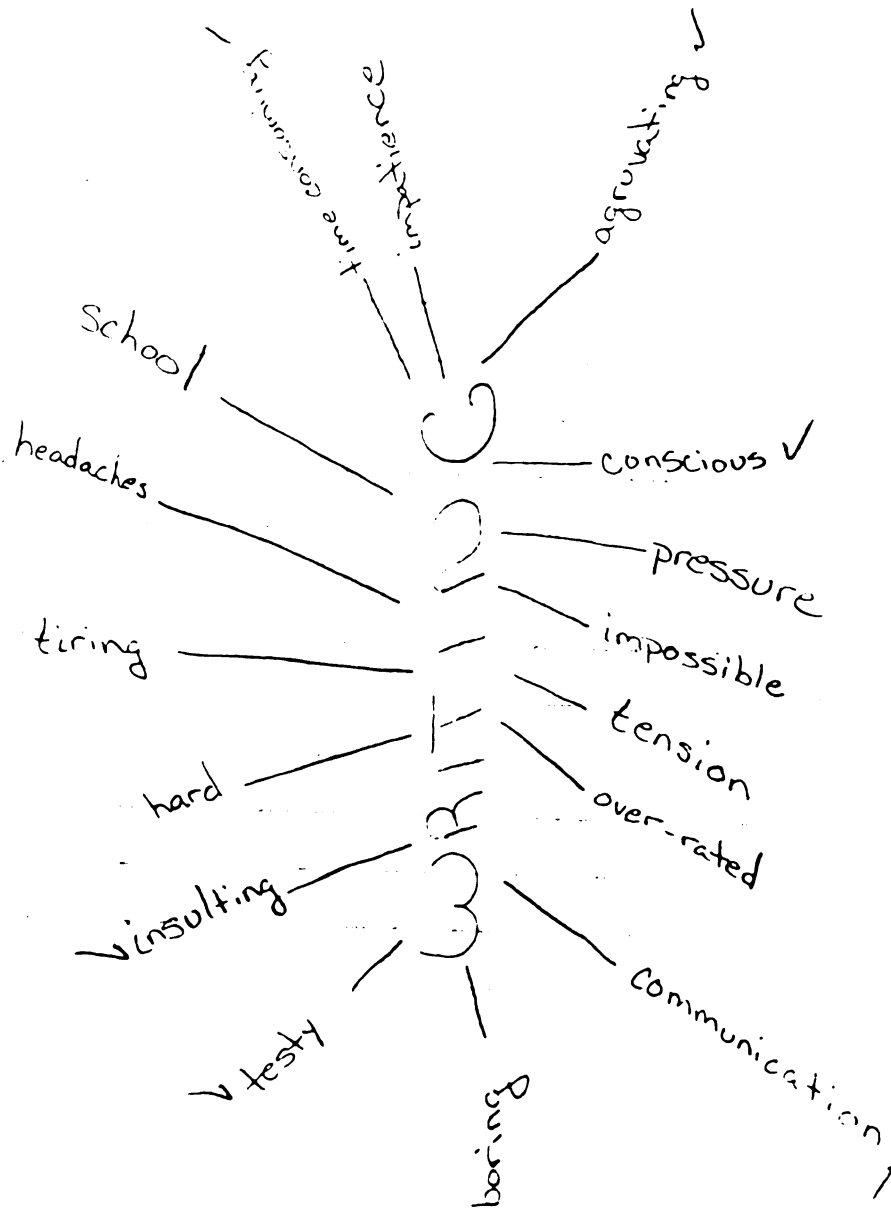
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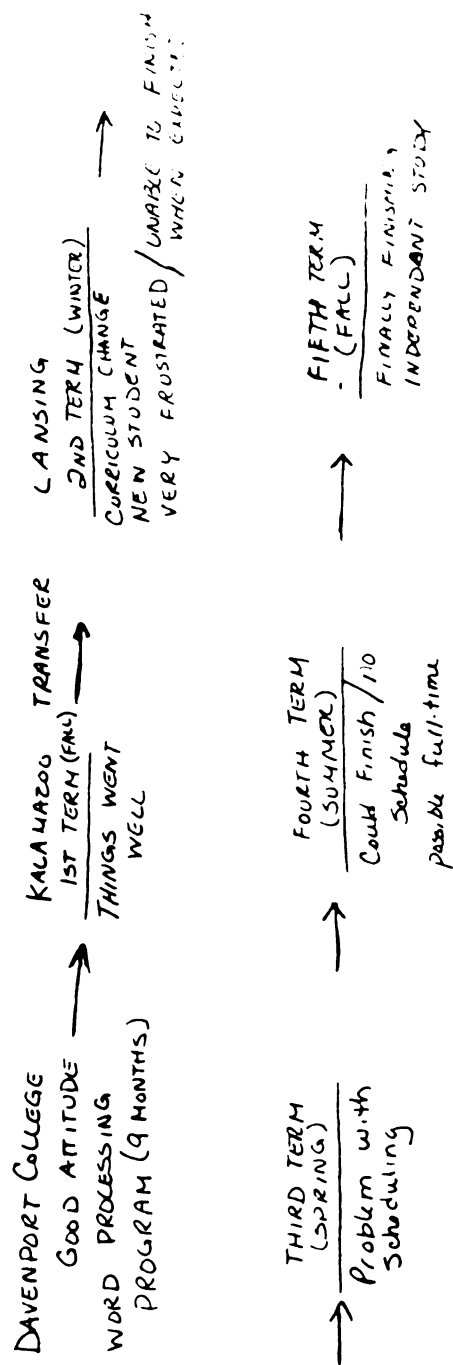
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APPENDIX

Shirley's Cluster
Annie's Map
Wayne's Map of Annie's essay
Donald's first map
Donald's second map

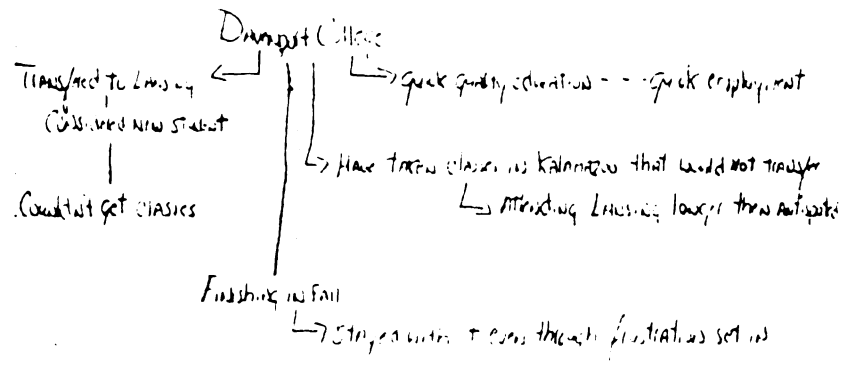


Shirley's Cluster

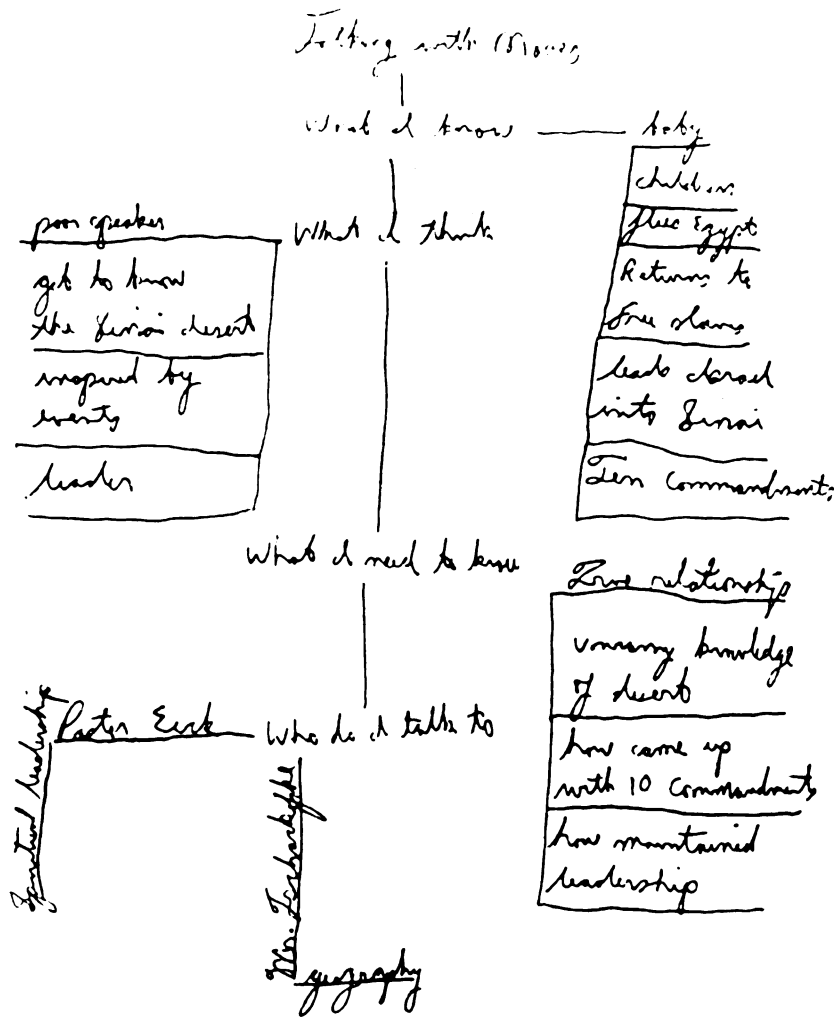


FINALLY FINISHED
TOOK FIVE TERMS RATHER THAN THREE

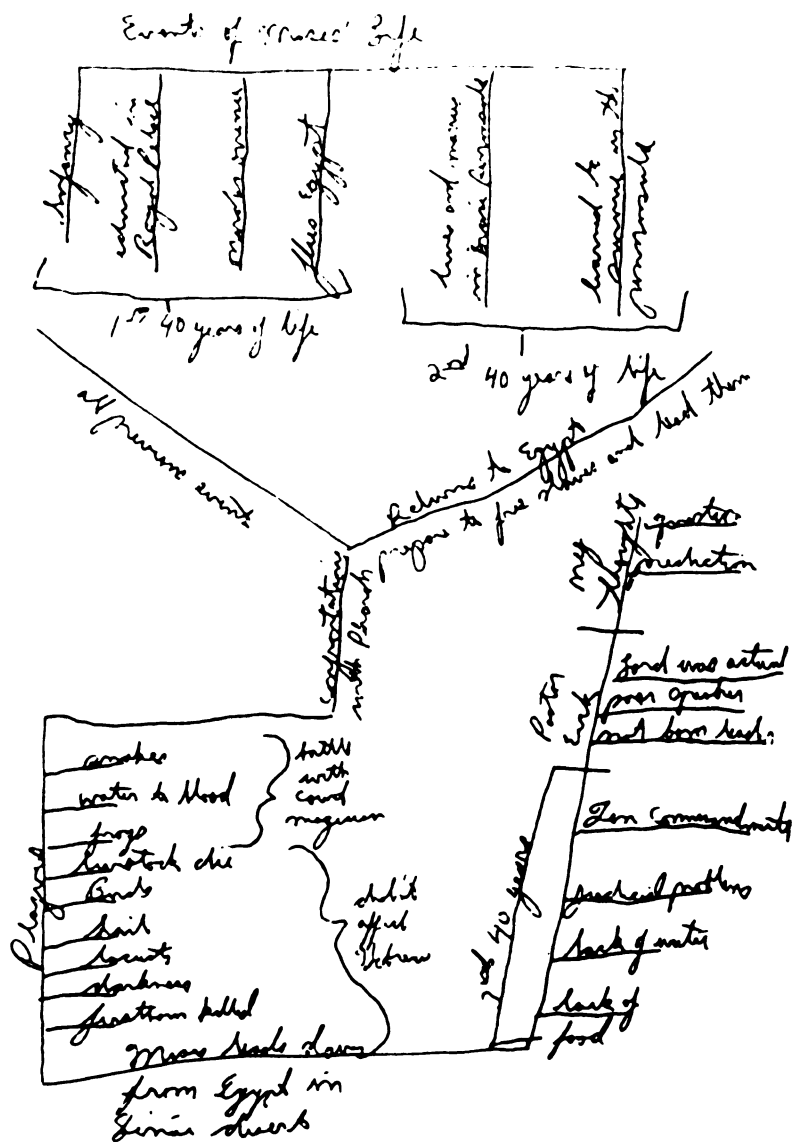
Annie's Map



Wayne's Map of Annie's Essay



Donald's First Map



Donald's Second Map