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Creative teaching : an exploratory study of janusian and homospatial thinking as exhibited by selected elementary school teachers in planning and implementing novel learning activities.

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CREATIVE TEACHING: AN EXPLORATORY STUDY OF JANUSIAN

AND HOMOSPATIAL THINKING AS EXHIBITED BY SELECTED

ELEMENTARY SCHOOL TEACHERS IN PLANNING AND

IMPLEMENTING NOVEL LEARNING ACTIVITIES

A Dissertation Presented

By

GARY S. SOROKA

Submitted to the Graduate School of the

University of Massachusetts in partial fulfillment

of the requirements for the degree of

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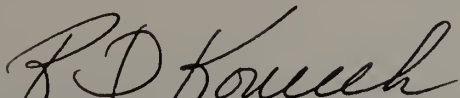
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Approved as to style and content by:

_____
Richard Konicek, Chairperson

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Michael Greenebaum, Member

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Doris Shallcross, Member

_____
Mario Fantini, Dean
School of Education

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This dissertation is dedicated
to the teachers who generously
gave of their time and energy
to participate in this study.

ACKNOWLEDGMENTS

This dissertation was made possible by the encouragement and support of many individuals. I would especially like to extend my gratitude to those without whose help this study might have been no more than just another interesting idea.
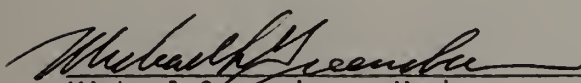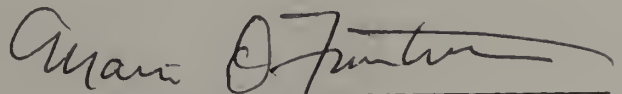
There was no greater supporter, friend, or mentor during the course of this study than my advisor Richard Konicek. He has been a constant source of guidance, encouragement, and good ideas. His positive thinking, as well as his ability to take many different perspectives have provided me with a model for exploring life with optimism and creativity.

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ABSTRACT

Creative Teaching: An Exploratory Study of Janusian

and Homospatial Thinking as Exhibited by Selected

Elementary School Teachers in Planning and

Implementing Novel Learning Activities

(February 1984)

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This study explored teachers' creative thinking by focusing on two thought processes, janusian and homospatial thinking, which are thought to underlie creative production (Rothenberg, 1979). "Janusian thinking" refers to actively conceiving of opposites or antithetical ideas or concepts simultaneously; and "homospatial thinking" refers to actively conceiving of two or more discrete entities occupying the same spatial location. The purpose of the study was twofold: first, to develop and describe a methodology for observing and documenting evidence of janusian and homospatial thinking; and second, to observe and describe occurrences of janusian and homospatial thinking which may take place as teachers plan and implement novel learning activities.

To provide a theoretical background for the study, the review of the literature compared Rothenberg's creativity theories with ten selected perspectives on the creative process. Literature on creative teaching and teachers' thought processes was also reviewed.

The participants were three teachers from an elementary school in Amherst, Massachusetts. Qualitative methods, including in-depth interviews, field observations, teachers' journals, and researcher field notes provided the data. Interviews were transcribed and these along with the other sources of data were analyzed for evidence of the two thought processes. Preliminary findings were shared with the participants to obtain their perspectives. In addition, external judges independently reviewed selected examples to confirm the analysis.

The participants exhibited evidence of janusian and homospatial thinking, however creativity was of a modest level. The methodology was partially successful in that evidence of the processes was found; nevertheless, the aspects of "simultaneity" in janusian thinking, and "superimposition of entities" in homospatial thinking were difficult to verify. Specific examples are presented to illustrate elements of janusian and homospatial thinking, and an assessment of the methodology is presented. Suggestions for a refined methodology and recommendations for further research are offered.

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INTRODUCTION

Teacher creativity is the subject of the research described in
this study. The intent of this investigation is to add to the body of
knowledge about teachers' thought processes as they plan and implement
novel or unique learning activities. This introductory chapter opens
with a brief discussion of teaching as a creativity activity, the need
for more creativity in education, and our current lack of
understanding about the creative process in teachers. This discussion
leads to statements of the specific problems and purposes which guide
the investigation. The remainder of the chapter presents definitions
of the terminology, an explanation of the relevance of the study,
delimitations of the study, and an overview of the remaining chapters.

Teaching as a Creative Activity

A premise of this study is that teaching can be a creative
activity which, at its best, is exciting, dynamic and meaningful for
both teachers and their students. Teaching at its worst is
irrelevant, static, boring and anxiety producing; it makes no
allowances for the needs, interests or the abilities of the learners,

and may threaten students to the extent that they become unwilling to take some of the risks necessary to learn. Poor teaching is characterized by inflexible curricula implemented by inflexible teachers who utilize didactic approaches and have students memorize isolated bits of information for unknown purposes.

When teaching is at its best, it seems relevant to the needs of the learners. Sensitive teachers know that to make instruction relevant, they must consider many variables. They know that their students are individuals with individual needs, skills, and abilities, and that these change on a daily and sometimes minute-by-minute basis. These teachers know that their own mood and the moods of their students affect the success of learning activities. They know that whether people feel good, bad, happy, secure, angry, excited, tired, hungry or ill has an effect on the success of a lesson. These teachers are also alert to learning opportunities that are present in serendipitous events. They eagerly pursue unanticipated thought-provoking questions; they effectively incorporate classroom visitors into activitites; they welcome new or conflicting ideas when they come to light in classroom discussions, and they find ways to turn unexpected problems into situations that promote learning.

Responsive teachers allow for flexibility in their instructional plans because they know that they cannot predict everything that will impact upon a particular lesson. Although planning usually begins weeks, months, or even years ahead, the plans for a particular day are usually not complete until the day before. At times, lessons are not

planned until the morning or minutes before they begin, and frequently
these plans are changed or created "in-flight" during the actual
implementation of the lesson. Mitchell (1951) points out that the
dynamic nature of instruction requires the school's curriuclum to be
flexible and allow for change:

> ...<u>any</u> curriculum material must be permanently
> tentative. Any curriculum plan must adapt to
> changing times. A fixed curriculum is an anomaly
> if we consider "children" and "environment" two of
> the cornerstones upon which a curriculum is built.
> Indeed the third cornerstone, "social ideals,"
> should not remain fixed. (p. 197)

A "permanently tentative" curriculum requires teachers to be
active decision makers. They are interpreters of society's goals,
while remaining sensitive to individual students' needs as they plan
instruction. Dewey (1963) claims that this is both necessary and
possible, and that both can occur simultaneously. He describes as a
"radical fallacy...the supposition that we have no choice either to
leave the child to his own unguided spontaneity or to inspire
direction upon him from without" (p. 30). Dewey argues that the
teacher has the critically important role of planning a learning
environment which provides for the child the valuable lessons society
has to offer, allowing at the same time for the child to direct his or
her own activity.

> The value of the formulated wealth of knowledge
> that makes up the course of study is that it may
> enable the educator <u>to determine the environment</u>
> <u>of the child</u>, and thus by indirection to direct.
> Its primary value, its primary indication, is for
> the teacher, not for the child. It says to the
> teacher: such and such are the capacitites, the

fulfillments, in truth and beauty and behavior,
open to these children. Now see to it that day by
day the conditions are such that their <u>own</u>
<u>activitites</u> move inevitably in this direction,
toward such culmination of themselves. Let the
child's nature fulfill its own destiny, revealed
to you in whatever of science and art and industry
the world now holds as its own. (p. 31)

Within the teacher-determined environment, which changes daily, the
teacher allows for individual needs, abilities and interests by having
children direct their own activity. Important in Dewey's formulation
is that the teacher and children do not direct learning activities in
isolation of each other, they are each simultaneously directing and
being directed by one another.

The teacher's role in planning for instruction is a complex one.
Viewing the teacher as an active, curriculum decision maker means that
the teacher does much more than convey information. During the
planning process, the teacher adapts "fixed" curriculum ideas which
have been handed down from society via the school's curriculum guides
and textbooks. The teacher interprets, integrates and modifies these
plans. A teacher considers many bits of information about lesson
content, teaching materials, teaching strategies, and student,
community and societal needs. Throughout the whole process the
teacher filters all of this information through his or her belief
system and ultimately a lesson plan emerges. Sometimes vague and
sometimes explicit; sometimes written down and often only in the mind
it guides the teacher's actions.

Exactly how teachers go about the business of developing
learning activities, creatively solving instructional problems,

creating learning environments, and making other instructional decisions remains unclear. However, Shavelson and Stern (1981), Clark and Yinger (1977), and Joyce (1978-79) indicate that there has been recent interest and research in the area of teachers' thinking during the planning and implementation of instruction. Research by Zahorik (1975) and Yinger (1977) suggests that teachers do not actually plan using the traditional rational curriculum planning model described by Tyler (1950) and Popham and Baker (1970). In the Tyler model planning is described as proceeding along four sequential steps: (1) identifying objectives, (2) selecting instructional activities, (3) organizing the activities, and (4) planning a means of evaluation. Yinger's findings suggest that "activity" rather than the "objective," is the basis for planning. Zahorick's findings are similar in that decisions about "activities" were the most common type of thoughts exhibited, although lesson "content" was the most common starting point for teacher decision making. The intent here is not to describe these studies in depth, rather to indicate that our traditional notions about systematic curriculum planning may only exist in theory and not in practice. The research mentioned above and additional studies which are described in Chapter II indicate that progress is being made in learning about teachers' thought processes, however, there is general agreement that there remains much still to be learned.

The basic position taken in this study is that good teaching is a creative art. Lieberman and Miller (1978) claim: "Teaching is an

art....Some parts lend themselves to programming and rationalized efforts, but in the long haul much artistry is practiced..." (p. 56). The creative planning of lessons could be compared to the work of an architect. The teacher designs learning activities to specification of time, materials, content, goals, activities, student needs, etc. The architect plans buildings to specifications using certain materials, client needs, cost limitations, environmental and esthetic considerations. They both create plans; both can manipulate variables; both can incorporate innovative, unique or novel ideas into their plans; both can make plans that have varying degrees of success; and both must adapt to unforeseen problems and make last minute changes. The products of their efforts are frequently very different, however. A structure of some sort results from the architect's plans, whereas, the teacher's plans result in a series of interactions with students.

In terms of product, a closer analogy can be drawn between the teacher and a director of a play. Both produce plans which result in a type of performance. The director plans the "telling" of a story; the teacher plans an instructional activity in which children interact with and learn about their environment. The analogy is most apt if the director is perceived to allow the performers a great deal of latitude in interpreting the roles, such a director would know the abilities of the performers would tailor the script to these capacities, and encourage the players to exercise these to the fullest extent in thier performance. The analogy is least appropriate when

the director is too strict in defining the story line and imposes this view on the performers allowing them no room for their interpretation. The perspective taken here is that when both the director and performers' interpretations are taken into account and permitted to operate simultaneously, the final performance will be esthetically enriched.

When teaching is at its best, stepping into a classroom to conduct a lesson is like stepping out onto a stage, and every day can be like an "opening night." The students are more than an audience, and more than performers. They, along with the teacher, direct and act out parts in an emerging, constantly changing curriculum script. Having both the teacher and the learners be active directors of the classroom events is interesting, relevant, and educationally productive. How teachers think as they plan and carry out learning activities in settings where approaches, content, goals, and other variables are rapidly changing is a major interest of this study. Since teachers engage daily in creating learning environments and solving unique instructional problems it seems particularly useful to look at teachers' thinking in terms of its creativity.

How the creative process operates is the subject of many differences of opinion. Rothenberg and Hausman (1976), Busse and Mansfield (1980), and Woodman (1981) for example, review numerous and often distinctly different theories about how the creative process works. For this study, the work of Albert Rothenberg, is used as a theoretical lens for observing the thought processes of teachers as

they plan and implement lessons. The research by Rothenberg (1979a, 1979b, 1982, 1983), Rothenberg and Sobel (1980, 1981), and Sobel and Rothenberg (1980) focuses on the cognitive process of eminent creative artists and scientists. From this research Rothenberg concludes that two processes, "janusian thinking" actively conceiving of opposite or antithetical ideas or concepts simultaneously; and "homospatial thinking" -- actively conceiving of two or more discrete entities or sensations occupying the same spatial location; play a central role in the thinking of highly creative individuals. If these two thoughts processes are exhibited by creative scientists and artists, then it raises the question of whether these processes may also be observed in the creative planning of teachers as they develop and carry out new learning acivities? This study sets out to address this question; the specific purposes of the study are described in detail below.

Problem Statement

The overarching problem addressed in this study is that little is known about the thought processes of teachers as they engage in the planning and implementation of novel, unique or innovative learning activities. Investigation of the creative thought processes of eminent artists and scientists by Albert Rothenberg (1979a) suggests that two processes, "janusian" and "homospatial" thinking, play a critical role in creative thinking. The extent to which teachers utilize these processes in the planning and implementation of novel learning activities has not been explored. To conduct further research

in this area, two specific problems need to be addressed: First, no methodology has been developed for observing and identifying janusian and homospatial thinking in educational settings; and second, there is a lack of documented examples of janusian or homospatial thinking that have been observed and identified in teachers' instructionally related behavior.

Purpose of the Study

This study has two major purposes: 1) to develop and describe a methodology for observing and documenting evidence of janusian and homospatial thinking which teachers might employ in planning and implementing novel or innovative learning activities; and 2) to observe and describe occurrences of janusian and homospatial thinking which may take place as teachers plan and implement novel or innovation learning activities.

With regard to the first purpose this study presents a description of a methodolgy, its implementation, and a critique of its effectiveness. Problems and successes of the methodology are explained and suggestions for improving the methodology are offered.

In reference to the second purpose, the study presents examples taken from observations of teachers and interviews with them about their thoughts before and during teaching which contain elements of janusian and/or homospatial thinking. Potential examples of janusian thinking are presented in terms of how well they satisfy four criteria:

1. evidence that antitheses, opposites, paradoxes, contradictions or reversals were exhibited in the teacher's thinking;

2. evidence that opposites, antitheses, etc., were juxtaposed or otherwise brought together and perceived simultaneously;

3. evidence that something was produced that was new and useful;

4. evidence that the teacher was consciously aware of his/her thought process.

Potential examples of homospatial thinking are presented in terms of how well they satisfy four criteria:

1. evidence that multiple, discrete images were present;

2. evidence that images were superimposed or fused in the same spatial location;

3. evidence that something was produced that was new and useful;

4. evidence that the teacher was consciously aware of his/her thought process.

Definition of Terms

The definitions provided in this section are those of the researcher except where otherwise noted. This summary is intended to provide the reader with a listing which may be referred to readily, and give the gist of the meaning for each term. Several of the terms: "creativity," "creative process," "homospatial thinking," "janusian thinking," "new/novel," and "valuable," require somewhat involved explanations, these elaborated discussions have been deferred to Chapter II.

Creativity.--The ability or capacity to produce something which is both new and valuable as perceived by the creator.

Creative Process.--The thinking actions of a person that involve combining and separating information: concepts, ideas, images, feelings and other sensory stimuli which results in new and valuable products.

Creative Teaching.--The actions of teachers which result in new and valuable instructional products such as the development of plans for learning activities, learning environments, or instructional strategies. Products may also include the interactions between the teacher and students which address instructional needs, concerns, and problems.

Curriculum.--The goals, objectives, and activities which the school explicitly and publicly endorses.

Emergent Curriculum.--The goals, activities and experiences that result from the planning and the interaction of the teachers and students who are actively engaging within an educational setting.

Homospatial Thinking.--"Actively conceiving two or more discrete entities occupying the same space, a conception leading to the articulation of new identities. Concrete objects such as rivers, houses, and human faces, discrete sensations such as wet, rough, bright and cold, and also patterns and written words are superimposed, fused, and otherwise brought together in the mind and totally fill its space" (Rothenberg, 1979a, p. 69).

Janusian Thinking.--"Actively conceiving two or more opposite or antithetical ideas, images, or concepts simultaneously. Opposites or antitheses are conceived as existing side-by-side or as equally operative and equally true" (Rothenberg, 1979a, p. 55).

Learning Activity.--A purposeful instructional action or series of actions that are planned and guided by teachers and which engage students in directing their own learning, acquiring knowledge, skills and/or attitudes through interactions with the environment.

New/Novel.--The quality of being perceived by a particular individual for the first time.

Teaching.--Purposeful interactive process between students and teachers in pursuit of educational goals.

Teaching Plan.--A written or mentally conceived set of intentions for conducting a learning activity; a plan might include goals, objectives, teaching strategies, lesson content, activities, and means of evaluation, however, a plan might not include all of these.

Valuable.--The quality of serving a useful purpose as perceived by a particular individual.

Need for the Study

This study addresses two principal areas of need. In the first place, a better understanding of how teachers think as they plan and implement novel learning activities is required in order to improve

instruction.   Secondly, there is a need to develop and refine the research methodologies used for examining teachers' thought processes.

Many researchers, Olson (1977), Clark and Yinger (1977), Joyce (1978-79), Shavelson and Stern (1981), and Elbaz (1981) call for more research aimed at reaching a better understanding of teachers' thought processes.   Joyce (1978-79) describes the need as follows:

> ...until we explore the thoughts and the feelings that do occur during teaching, we may not have the wherewithall to understand the visible behavior clearly enough without any viable understanding of the mind that formulates that question. And what we have is only a record. Unless we know what thought is behind the utterance, we can know very little about what causes it. Most especially, if we care to use the information about teaching as a solid base for improving it, we absolutely need to understand why teachers behave as they do. (p. 12)

A growing consensus among researchers is that for improvement in the field of education to occur, a foundation consisting of a better understanding of teachers' thought processes must be formed. This study seeks to strengthen this foundation for further research and educational improvement by providing in-depth descriptions of teachers' thought processes using one theory of creative thinking. An exploratory study of teachers' thinking for evidence of janusian and homospatial thinking, as described by Rothenberg, may provide new insights about teachers' planning and implementation of new learning activities. A review of the literature indicates that there have been no previous attempts to examine teachers' thinking from this perspective.

Thus, the study is anticipated to be useful for researchers by identifying new components in teachers' behavior that could account for teachers' planning and implementation of new learning activities, as well as account for some of the idiosyncrasies observed in teachers' planning efforts. The exploratory nature of the study is intended to generate new ideas about the ways teachers create, modify and implement new ideas and to encourage further study along these and similar unexplored lines.

For teacher educators, school administrators, change agents, and other educational leaders, the detailed descriptions of teachers' thought processes in the study may provide some insight into the dynamic process teachers use in planning and implementing novel learning activities. Additionally, as more information about teachers' use of janusian and homospatial thinking is gained, it may be possible to develop training programs for teachers to help them make more effective use of these processes in their planning.

For the teachers participating in the study, the in-depth exploration of their thinking processes is expected to provide insights which might enable them to be more effective planners. Other teachers reading the results of this study may also gain insights about their own creativity and increase their teaching effectiveness.

The methodology utilized in the study is developed in response to the perceived lack of an existing methodology which would gather the desired information. The methodology described in the study should provide other researchers with a model for conducting research

in the area of teacher creativity. The descriptions of the successes and difficulties experienced in using the methodology should be of particular use to researchers who follow in this area.

Delimitations of the Study

In accordance with a qualitative methodological approach, the sample in the study has been kept purposefully small to enable the researcher to conduct in-depth interviews with the participants and to make regular observtions of their classrooms. It is not the purpose of the study to generalize the findings of the study to other teachers, but rather to analyze and describe the thought processes of a few elementary school teachers, and to determine if they exhibit evidence of janusian and/or homospatial thinking in their planning for or during instruction.

Safeguards are employed to ensure the trustworthiness of the findings. It is generally recognized that observer bias will enter into the findings of qualitative research, indeed it is viewed as desirable for the researcher to get as close to the subjects in the study as is possible in order to understand their experience from their perspective. However, in order to minimize the distorting effects of observer biases on the findings the following measures were taken: (1) all interviews were tape-recorded and transcribed to minimize the effect of observer bias in the collection of data; (2) interview transcripts were reviewed by the participants for accuracy;

(3) observer biases, where they were evident to the researcher, are noted and reported; (4) analysis of the data was shared with the participants for their reactions and their perspectives are noted and reported in the presentation of the findings; (5) external judges conducted independent analyses of the data and their perspectives are incorporated in the presentation of the data; and (6) multiple interpretations of the findings are presented as plausible alternatives.

Overview of the Study

The remaining chapters have been organized in the following manner. Chapter II provides a review of the literature and the theoretical background for the study. This chapter covers two areas: (1) creativity as it is described by selected writers and researchers -- special emphasis is given to Rothenberg's conceptions of janusian and homospatial thinking as they relate to creative production; and (2) teachers' creative thought processes. Chapter III describes the theoretical background for the use of qualitative methodologies to investigate teachers' thinking and describes the research design, detailing how the study was conducted. The results of the study are presented in Chapter IV. This chapter gives specific examples of teachers' planning and implementation of learning activities which exhibit elements of janusian and homospatial thinking. Other evidence of the two processes is presented in a general discussion. The chapter concludes with information which was gathered about the

effectiveness of the methodology; an analysis of the problems and successes in the use of the methodology are outlined. Finally, Chapter V presents the conclusions that are drawn from the investigation, their implications are given and recommendations for further research are provided.

CHAPTER II

THEORETICAL BACKGROUND AND REVIEW OF THE LITERATURE

This study invited a review of the literature in three main
areas. This chapter presents the first two areas: the literature in
creativity and the creative process and the literature on teachers'
creative thought processes. The third area, the literature on
research methodologies used to collect information about teachers'
thought processes, is reviewed in Chapter III. The present chapter
opens with a discussion of the literature on creativity and the
creative process. Rothenberg's theories about the processes of
janusian and homospatial thinking occupy a major portion of this
discussion. Following the presentation of Rothenberg's theories, the
perspectives of ten other writers are presented and compared with
Rothenberg's work. A brief summary and critique of Rothenberg's work
and the other ten writers concludes the first section. The second
section of this chapter presents a discussion of the literature on
creative teaching and teachers' thought processes. The need for
creative teachers, blocks to creativity in teaching, and some positive
forces encouraging creativity in teaching are presented. Next,
research about teachers' creativity and creative thought processes is

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presented. This research is grouped under three headings: (1) research on teachers' planning, (2) research about teachers' thoughts during teaching (interactive thought processes) and (3) teachers' implicit theories guiding teaching. A summary concludes the chapter.

Section I
Creativity and the Creative Process

Rothenberg and Hausman (1976), Busse and Mansfield (1980) and Woodman (1981) present many different approaches which have been applied to describing creativity and the creative process. Busse and Mansfield (1980) points out that the diversity of the definitions of creativity and creative processes is understandable when one realizes that past investigators and theorists have approached the topic with different purposes in mind, utilized different methods of investigation, and possessed different personal philosophies. No attempt has been made here to summarize all of the different viewpoints. Instead, this review presents a description of Rothenberg's theory of creativity and the creative process and compares this with several pertinent perspectives by other researchers and theorists. A description of "creativity" is presented first, followed by a detailed look at the creative process.

Defining Creativity

Rothenberg's (1979a) definition of creativity provides a basis for the one used in this study:

> While there are many ways of defining creations and creativity, I have chosen to be guided by what are perhaps the most stringent definitions of all; creations are both "new" and "valuable" and creativity is the state or capacity through which a new and valuable entity or quality is brought into being. (p. 330)

The importance of the aspects of newness and value are stressed by Bruner (1969), Hayes (1978), Feldman (1980), and Perkins (1981). Bruner (1969) defines creativity as an act that produces "effective surprise" (p.18). He proposes that "...all of the forms of effective surprise grow out of a combinatorial activity--a placing of things in new perspectives" (p.20). He elaborates further that "...to create consists precisely in not making useless combinations and in making those which are most useful..." (p. 20). Similarly, Perkins (1981) stresses the same two qualities: "...creativity means original and of high quality" (p.6). He elaborates further that: "Thus a stereotyped product does not count as creative, however fine it may be. Likewise, a product with nothing else to recommend it does not count as creative, however original it may be" (p. 6). Borrowing from the above descriptions, for the purpose of this study "creativity" is defined as: The ability or capacity to produce something which is both new and valuable.

Three questions arise from this definition. What is the
"something" or the product which is produced? What is meant by "new?"
And what is meant by "valuable?" In the context of this study,
products could be both tangible or intangible. Tangible products
include such things as poems, books, paintings, inventions, scientific
discoveries and the like. Less tangible products, equally acceptable,
include acting performances, verbal and non-verbal interactions, and
solutions to problems. Specific types of products of creative
teaching are addressed later in the chapter.

The meaning of "new" is restricted in this study to the world of
the thinker who has produced the creation. This perspective
differentiates this study from Rothenberg's research as he restricted
most of his investigations to eminent individuals who have exhibited
high levels of creativity--where "new" has been associated with
unprecendented. However, Rothenberg (1979a) recognizes various other
interpretations:

> I have connected "new" with the quality of being
> unprecedented but surely alternative meaning and
> interpretations come to mind: (1) Nothing is
> really new under the sun; things that seem to be
> new are merely reappearances of past substances or
> forces (remote, obscure, or forgotten). (2)
> Things are merely new in a particular context;
> something that already existed in another context
> is brought to our awareness or into our sphere,
> and therefore seems to be new. For the native
> bushmen of Australia, almost everything in the
> civilized world is considered new, including what
> existed for centuries. (3) New things result from
> combinations and recombinations of things that
> existed before. Perfectly respectable are all of
> these alternate interpretations of "new", and all
> provide an approach to much that is considered new
> in human experience... (pp. 331-332)

Proving that something is unprecedented is too complex a task for this study. Instead, it is more useful to regard as "new" that which the teacher perceives for the first time. Guilford (1977) forcefully presents a case for this view of "newness":

> ...the creative idea is one that the thinker never had before; it is new to that person. We could never determine whether an idea is entirely new in the whole population. We stand a much better chance of showing that it is new for the individual. (p. 160)

Further support for this perspective comes from the work of Piaget (1977), who in his investigations of children's invention focused his observations on newness from the perspective of the child. Thus, drawing from the perspectives presented above, the functional definition of "new" for this study is that creations are new when they are perceived by the thinker for the first time.

The last point of clarification is in regard to the value and quality of the product created. In examining creations some, like Guilford (1977), choose to side-step the issue. He states: "A science does not deal with social values; it only observes and reports, with resulting reflections and conclusions" (p. 160). Others like Perkins (1981), describe value in terms of quality. He states that quality varies drastically from context to context. "A good-quality advertisement is good in virtue of different features than is a good-quality astronomical theory or a good-quality dance" (p. 6). He goes further to say:

> There is no way that an account of "creating" or "creative" can get explicit about the many partly

> tacit criteria of originality and quality that
> apply in different contexts, especially when
> invention often makes its own standards of
> quality, by leading people to discover kinds of
> quality they had little awareness of before. This
> is the way that it is, and we will simply have to
> live with it. (p. 6)

Rothenberg (1979a) also notes the difficulty of determining the

value or quality of a product; however, he does offer a solution:

> Positive value is notoriously hard to pin down and
> analyze. Who for example, decides the degree of
> positive value in a particular accomplishment? Is
> it the contemporary society, the "judgement of
> history," the prize givers, the critics, the man
> on the street? Difficult as this question is for
> the aestheticians, historians, and the like, it is
> even more difficult for the scientist
> investigating the nature of the creative process.
> The scientist requires an objective criterion and
> therefore the only solution from this point of
> view is to invoke the principal of consensus or
> consensual judgement. (p. 4)

As indicated above, determining the value of something is complicated

by differences of opinion, subjectivity and contextual differences.

However, Rothenberg's suggestion of obtaining "consensual judgement"

is potentially useful in attributing value to a classroom interaction

or learning activity. Making such judgements requires knowledge of

the classroom situation, the students' interests and needs,

instructional goals, and the outcomes of the particular planning and

implementation efforts. Only the teacher has a complete understanding

of these variables. Therefore, the teacher-creator's perspective

about the value of an instructional activity would be primarily

important. Concurrence between the teacher and an observer-judge may

be useful in confirming the value in a particular interaction,

although the value deciding powers of the observer-judge will always

be limited in that he/she will always be operating from a smaller knowledge base than the teacher being observed. However, the greater objectivity the observer brings to the perceptions of the value of an activity, may counterbalance the deficiencies in the observer's lack of background knowledge.

Additionally, it is perceived as useful in this study to further substantiate the value of instructional activities by having independent judges review information gathered about the classroom events and reach a consensus about the value and utility of the teacher's planning and interactions with students.

To summarize, creativity is seen to have two aspects. First something new is produced, and second the product must have some value or serve some useful purpose. The judgements about the new and useful aspects of a product, in this study, are made in relation to the perceptions of the person creating a solution to a problem, developing a plan to meet a need or goal, or resolve some issue. In this study the teachers' views about the newness and value of various instructional plans and activities are the single most important factor in making these determinations. However, concurrence with an observer judge and consensual judgements between independent raters are seen as means of objectifying the teachers' perceptions.

Creative Thought Processes

Most writers on creativity agree that "creative thought processes" or "creating" involves the making of combinations and

separations. Bruner (1969) states that creativity depends upon making "useful combinations" (p. 20). Adams (1974) says that creativity requires the manipulation and recombination of experience (p. 60). For Koestler (1964), the creative act "uncovers, selects, re-shuffles, combines, synthesizes already existing facts, ideas, faculties and skills. The more familiar the parts, the more striking the new whole" (p. 120).

Gordon (1966) says that "Creative activity depends on developing a new context by which to view the familiar given. Only then can we jolt it out of its immutable state into a condition that will permit innovation" (p. 5). He terms this innovative process "making the familiar strange." It is a process of breaking connections. "Interdependent of the innovation process is the learning process where one gains an understanding of a new problem or a new idea by making the strange familiar. Understanding requires bringing a strange concept into the familiar context" (pp. 5 & 6).

Ainsworth-Land (1982) describes the creative process from a systems perspective:

> The logic, or perhaps I should say the metalogic, of the creative process is founded on the simple fact that disorder feeds order. In any system, once a relative orderliness has been achieved, the only means by which a broader and more complex interrelationship among the various elements can be achieved is by introducing or generating disorder. The system can come apart to be put back together in a much more integrated way. A system that resists this creative disintegration and re-integration can only suffer the gradual erosion of its established order due to the energy required to protect the system. (p. 231)

Like Gordon's perspective, Ainsworth-Land's view emphasizes an interdependence of separating and combining operations in the creative process. As a final example of the literature in this area, Rothenberg (1979a) emphazises the separating and combining operations of the creative process:

> The creative process is a matter of continual separating and bringing together, bringing together and separating, in many dimensions -- affective, conceptual, perceptual, volitional, physical -- at once...bringing together and separating and bringing together -- articulation -- characterizes all phases of the creative process. Beginning with undifferentiated knowledge and experience, the creator proceeds through differentiation and joining, expansion and constriction, stray pathways and returns, diffusions and sharpenings, fantasy and reality, world visions and narrow technical concerns, cultural concerns and individual preoccupations, art styles and personal styles, arousal and ratiocination, abstraction and concretion, breaking and making. Always as there are factors and processes tending toward diffusion and expansion, there are equally strong factors and processes directed toward differentiation and joining. (pp. 369-370)

It may be concluded from the previous descriptions that there is general agreement that creating involves the making of combinations and separations. However, exactly how individuals go about the process of making combinations and separations is still a subject of theoretical disagreement. Of particular interest in this study, are Rothenberg's theories about janusian and homospatial thinking. They are seen by Rothenberg to have important separating and combining functions in the creative process. How Rothenberg perceives these processes to function is presented next, followed by a presentation of

ten selected perspectives by other writers. Each of these theories is discussed in regard to Rothenberg's theories of janusian and homospatial thinking.

Janusian Thinking

The term "janusian thinking" is used by Rothenberg to refer to a process of actively conceiving of opposites, at the same time. The term is based on attributes of the Roman deity Janus, the god of doorways. He was conceived of as having two or more faces looking in opposing directions simultaneously. Rothenberg (1979a) specifically defines the term as it is used in his theory of creative thinking as follows:

> Janusian thinking consists of actively conceiving two or more opposite or antithetical ideas, images, or concepts simultaneously. Opposites or antitheses are conceived as existing side by side or as equally operative and equally true. Such thinking is highly complex. It is intrinsic to creativity and it operates widely in all types of creative processes, intellectual and pragmatic as well as artistic. (p. 55)

In addition to simultaneously conceiving of opposites, Rothenberg specifies that janusian thinking is an active or conscious thought process. It is a product of a person's conscious desire to solve some problem or create a particular effect.

The contradictory nature of janusian constructs is illustrated in Rothenberg's (1979b) discussion of Einstein's effort to encompass Newton's classical theory of gravitation within a broad relativity principle.

> Pondering those seemingly irreconcilable
> constructs, Einstein reached a startling
> conception: "For an observer in free fall from a
> roof of a house," he realized, "there exists,
> during his fall, no gravitational field...in his
> immeidate vicinity. If the observer releases any
> objects, they will remain, relative to him, in a
> state of rest. The falling observer is
> therefore justified in considering his state as
> one of 'rest'."
>
> The general theory itself is highly complex, and
> the points of connection to Einstein's "happiest
> thought" are not simple to explicate or trace.
> But the specific structure of the key step is
> clear: Einstein had concluded that a person
> falling from the roof of a house was both in
> motion and at rest <u>at the same time</u>. The
> hypothesis was illogical and contradictory in
> structure, but it possessed a superior logic and a
> saliance that brought Newtonian physics and his
> own into the overall conceptual scheme. (p. 55).

Conceiving of a contradictory notion like simultaneously moving and
resting is at the heart of janusian thinking.

Many additional examples of janusian thinking in the areas of
literature, music and art are cited by Rothenberg (1979a, 1979b). Not
all of these areas will be explored here, however a couple examples
from literature, given below, help to illustrate the process. The use
of the janusian process is traced by Rothenberg (1979a) in the
conceptualization of several novels. For example, he indicates that,
at the outset, Joseph Conrad's idea for the novel <u>Nostromo</u> involved a
story about an "unmitigated rascal" who had stolen a large amount of
silver. Initially, the story did not have a great amount of appeal
for Conrad, however, it became more intriguing to him when he realized
he could attribute antithetical qualities to the story's main
character. Rothenberg relates:

> After indecision, the key idea for the novel, as
> Conrad reported it, came at the following point:
> "when it dawned upon me that the purloiner of the
> treasure need not necessarily be a confirmed
> rouge, that he could even be a man of character."
> The turning point idea of the criminal as rascal
> or rogue and man of character together led to a
> specific elaboration of a "twilight" land of good
> and evil simultaneously and the drive to write the
> novel.... (Rothenberg, 1979a, p. 194)

Rothenberg offers a second example from literature in which simultaneous antithetical feelings lead to the idea for one of Eugene O'Neill's novels.

> The Iceman Cometh developed from a conception that
> a friend's suicide was motivated by simultaneously
> antithetical feelings about a wife's infidelity.
> O'Neill realized that the friend had both wanted
> and not wanted his wife to be unfaithful and to
> sleep with another man. (p. 195)

In literature then, as in science and other creative endeavors, Rothenberg has uncovered evidence to suggest that the simultaneous conception of opposites or antitheses, janusian thinking, plays an important role in the creative process. Additional support for his theory comes from experimental research findings which suggest that highly creative individuals tend to be faster and use more opposites in responding to word stimuli in studies using the Kent-Rosanoff list. There were 113 students participating in the study, 63 were placed in the high creative group and 50 were identified as low creative. The students were identified as high or low creative on the basis of questionnaire responses. Evidence of students' independent initiative and early success in the creative arts or science was used to identify

high creative students. In comparing Nobel laureats' responses on the Kent-Rosanoff word association test to those of the college students rated high and low creative, Rothenberg (1982), found the Nobel laureates and high creative students to have a significantly greater tendency to respond more rapidly and with opposites. Such findings, Rothenberg concludes makes a strong case for the use of janusian thinking by highly creative individuals (p. 124).

Functions of Janusian Thinking

Janusian thinking serves the thinker in several ways. One of its chief functions is to separate information. Rothenberg (1979a) explains that janusian formulations "function to bring specificity out of undifferentiation and chaos" (p. 340). This specifying aspect or separating ideas, concepts, images and the like, is brought about through an "encapsulation" effect: "...one of the reasons that the creator engages in janusian thinking is that consciously or unconsciously, he is attempting...to encapsulate a dimension or, in a sense, a world" (pp. 362-363). "Encapsulation of a dimension" is a means by which the creator can separate out the essential elements of a situation and thus help in the conceptualization of an idea. Rothenberg (1979a) states:

> For artists and scientists as well as others, the
> task of creating is always, to some degree, the
> bringing of order to some area of knowledge and
> experience where chaos and the blooming, buzzing
> confusion reigned before. Small as it may seem in
> the face of such an enormous undertaking, the
> specification and organization provided by

> formulating and designating the opposites and
> antitheses pertinent to a particular area of
> knowledge and experience greatly help in the task
> of creation. (p. 358)

Rothenberg indicates that for the artist conceiving of opposites

serves as a means of identifying absolutes of truth and beauty; for

the scientist conceiving of opposites is a conceptual aid, and for an

experimenter in any field conceiving of opposites helps to identify

specific alternatives (p. 358).

The products which emerge from creative activity may not show

any clear evidence of the juxtaposition of opposites or antitheses.

This Rothenberg (1979a) attributes to the tendency of janusian

thinking to occur early in the creative process:

> Janusian formulations occur early in the creative
> process and serve to guide ensuing ideas and
> developments. Often therefore, they are changed
> and elaborated and are not clearly identifiable in
> the completed work. Some formualtions, however,
> emerge later in the process and remain intact and
> unchanged at the end. (p. 61)

He later elaborates:

> The creative process progresses from the
> formulation and specification of polarities,
> dichotomies, and extremes toward modulation.
> Rather than using diffuse or moderate elements and
> relationships as the start, and for some distance
> along the way, the creator is willing to deal with
> the risks of contradiction and conflict. He
> modifies and shapes the conflicting extremes in
> forming a creation. To leave things overtly as
> extremes would be uncreative. As reality seldom
> consists of extremes, his product would have
> little connection to the natural world. In the
> process of creation, there is a compromise between
> the needs of formulating along the way and the
> requirements of reality. (pp. 358-359)

Another major function of the janusian process is that it reveals to the thinker material which may be concealed in the unconscious. It functions in this respect much as if it were a "mirror image of dreaming." As Rothenberg (1982) points out:

> Instead of functioning to bind and obscure unconscious wishes, affects and drives, as in dreamwork, the janusian process operates in the reverse direction: it functions to unearth and free unconscious material. The janusian process is an ego function operating on the secondary process level which serves to bring unconscious material closer to the creative thinker's awareness. (p. 115)

Rothenberg believes that janusian conceptualizations are rooted in unconscious conflicts and that expression of simultaneously contradictory thoughts is associated with the process of "defensive negation." This psychological term refers to an ego protective denial of some sort. For example, a person might preface a remark by saying "This is not my opinion, but..." Or in a psychological therapeutic session a patient may say "I had this vision about a man, but it was not my father..." These comments probably mean the opposite, that it was the person's opinion or father. Rothenberg (1979a) states that a similar process operates in janusian thinking:

> The psychological function of simultaneous and mutual contradiction, the function allowing unconscious and preconscious material to appear in consciousness without excessive anxiety, is defensive negation of content in janusian thoughts. (p. 59)

Transcendence of time is described as another aspect of janusian thinking. Rothenberg (1979a) observed that during a creative act,

persons tend to experience a loss of a sense of time's passage. In part, at least, he attributes this to the simultaneity aspect of janusian thinking. He makes the point at length:

> The loss of the sense of time's passage is only one aspect of the timelessness involved in the creative process. Seclusion, intense concentration, and aroused involvement account for the subjective sense of timelessness to some extent, but there is a unique suspension of time during the creative process that is more specific than this.... This transcendence occurs in janusian thinking. For the creator engaged in the creative process conceives of opposites or antitheses simultaneously, not successively or in sequence. Through simultaneity both repetition and sequence are transcended.... When two or more elements operate simultaneously, they are outside of the continuing process of repetition, change, and flux we refer to as "time"; the janusian conception is out of time. (p. 339)

In summary, the above discussion describes three important functions of janusian thinking. First, the process separates out, specifies and differentiates material in an "encapsulation effect" that helps the creator to identify important aesthetic, or conceptual information in otherwise chaotic settings. Second, the janusian process helps to uncover conflicts embodied in unconscious and preconscious levels of awareness. And third, it enables the creator to, at least momentarily, transcend the bounds of time.

Differences Between Janusian Thinking and Dialectical and Dualistic Processes

Before moving on to a discussion of the homospatial process, several distinctions should be made between janusian thinking and other thought processes which are associated with opposition and

antitheses such as dialectical and dualistic thinking. Rothenberg differentiates janusian thinking from dialectical thinking in two major ways. First, dialectical thinking is a <u>stepwise</u> consideration of opposing elements or viewpoints rather than a <u>simultaneous</u> consideration of opposing elements or viewpoints. The second major difference is that dialectical thinking is a process whose activity moves toward an integration of opposing viewpoints where opposing elements are modified, compromised or otherwise reconciled.

However, in janusian thinking opposites or antitheses do not give up their properties, their properties remain intact and the opposing views or elements are seen as equally true or valid. Janusian thinking in itself does nothing to integrate the opposing or contradictory elements it embodies, however, it is seen as acting as a "way station" toward integration of opposites, antitheses, etc., by other processes such as dialectical, or homospatial thinking (Rothenberg, 1979a, pp. 155-159).

Recent work of Rothenberg (1983) indicates that janusian and dialectical processes may work together in the development of creative ideas. Rothenberg presents an account of the work of Neils Bohr as an example of the interplay of the two processes. While stepwise dialectical consideration of opposing theories of the wave/particle debate about the nature of light characterized Bohr's early approach to explain the phenomenon, it was eventually a janusian conceptualization of light as both wave and particle that led to the breakthrough "complementarity" principle. Zukav (1979), while using different

terminology, presents a discussion of the wave/particle debate that lends support for Rothenberg's analysis.

Dualistic Thinking

Rothenberg indicates that janusian thinking differs from dualistic thinking in important ways. First, dualistic thinking leads to a division of concept and conceptual systems into two all-inclusive categories -- for example, good and evil. Such dichotomizations preclude other viewpoints. Janusian thinking, on the other hand is characterized by multiple antithetical or opposing viewpoints in juxtaposition. Moreover, janusian thinking, in that it is a step toward an integration of antitheses is radically different from dualistic thinking which tends to divide and fixate categories. Dualistic thinking tends to bind the thinker into rigid, stereotyped patterns, permitting "either or" choices rather than the "both and" choices possible through janusian thinking (Rothenberg, 1979a, pp. 259-261).

Janusian Thinking in Summary

Janusian thinking is a conscious, simultaneous conceptualization of antithetical or opposing elements or viewpoints. It functions to separate out and specify salient information for addressing aesthetic, scientific and practical problems of all kinds. It also enables the thinker to transcend the limitations of time and to bring unconscious material closer to the conscious awareness of the thinker. Through

janusian thinking increased awareness of conflicting elements and contradictions produces surprising and novel results which help to energize and direct the efforts of the creator toward creative production. The way in which janusian thinking works in concert with homospatial thinking is described later in this section following a presentation of how the homospatial process functions.

Homospatial Thinking

In the previous discussion janusian thinking has been characterized as a process that juxtaposes antithetical elements simultaneously. The process is described as a means of raising one's awareness of contradictions or conflicts, such conceptualizations being a step toward integration of elements into new and useful ideas. Homospatial thinking is a means of integrating janusian conceptualizations, as well as ideas achieved through other means. Rothenberg (1979a) states:

> By means of homospatial thinking, opposites and antitheses in a janusian construct are superimposed or otherwise fused in space and integrations are produced.

The term "homospatial," comes from the Greek word "homois" meaning "same." Homospatial thinking, then, refers to a thinking process where two or more entities are conceived as occupying the same space. Images from various sensory modalities may play a part in the fusion as is indicated in the definition below:

> Homospatial thinking consists of <u>actively</u>
> <u>conceiving two or more discrete entities occupying</u>
> <u>the same space, a conception leading to the</u>
> <u>articulation of new identities.</u> Concrete objects
> such as rivers, houses and human faces, discrete
> sensations such as wet, rough, bright, and cold,
> and also sound patterns and written words are
> superimposed, fused, or otherwise brought together
> in mind and totally fill its space. (p. 69)

The salient characteristic of the process is that in the mind of the

creator, discrete entities (images, objects, symbols, sensations,

etc.) are superimposed, fused or otherwise brought together in the

same space or spatial locality. Like janusian thinking, it is a

conscious process that can also serve to uncover unconscious material.

One of the chief functions of the homospatial process is the

production of metaphor. Also, the process is seen as essential to the

creative manipulation of imagery in all sensory modalities:

> Constructive imagination, the type we consider
> intrinsic to creativity, involves mental images
> subjected to the homospatial process. The process
> is an essential ingredient, or perhaps "the"
> ingredient, in constructive or creative
> imagination. (p. 321)

From the above statement it is clear that Rothenberg attributes

a great deal of importance to the role of homospatial thinking in the

creative process. Two from the many examples presented by Rothenberg

(1979a, 1979b), and Rothenberg and Sobel (1980) are given below to

illustrate how the process operates in literature and in science. In

the first example, Rothenberg and Sobel (1980) show how literary

metaphors may result from homospatial thinking. In British poet

Nichols' "Sunrise Poem" the inspiration for the poem was attributed by

its author to a superimposition of a visual image to the sun "writing"

on the sea and an image from a postcard. Rothenberg and Sobel recount
the poem's inspiration below:

> [Nichols] describes a visual image of figures
> written on the sea by the rising sun, which was
> conceived simultaneously with and superimposed
> upon an image from a British Museum postcard.
> This latter image consisted of "a poet, possibly
> Persian, seated on the ground wearing a rose-pink
> turban, a green caftan and a little pair of black
> slippers." The first lines of the poem which
> arose directly from the superimposed images of the
> figures written on the sea and the picture of the
> poet were:
>
> > "The sun, a serene and ancient poet
> > Stoops and writes on the sunrise sea
> > In softly undulent cyphers of gold
> > Words of Arabian charactery." (p. 79)

A fusion of the sun and the poet on the postcard is seen as resulting

in a poetic metaphor -- a fusion of two discrete elements.

Another use of homospatial thinking is seen in the following in

which Rothenberg (1979a) describes the French chemist Edward

Benedictus' creation of shatterproof glass:

> Benedictus describes having a flask in his
> laboratory drop ten feet to the floor without
> breaking or shattering. Noting only that the
> liquids inside had evaporated and that there was a
> layer of celluloid enamel inside, he thought no
> more about the incident until some time later.
> After dinner one evening, he was thinking about
> two recent automobile accidents in each of which a
> young girl had her throat cut and was killed by
> broken glass. Reflecting on these, he described
> visualizing the following: "The image of my flask
> appeared superimposed [se superposa], in the pale
> outline of an 'over-impression' upon the
> constantly changing backdrop of life." Following
> this image of the flask superimposed on images of
> the girls and of the accident scenes, he went to
> his laboratory where he worked until dawn on "a
> plan which I proceeded to execute, point by point.
> By evening of the following day, the first sheet
> of Tiplex glass was created." (pp. 120-121)

The homospatial aspect of this account is the superimposition of the visual image of the unbroken glass flask and the images of the girls and the accident scenes.

The use of homospatial thinking is not limited to only scientific and literary creations. Rothenberg reported numerous examples from other fields such as art, music, and psychotherapy. The ways in which homospatial thinking is employed in psychotherapy are perhaps the most relevant to the field of education and are worthy of further discussion here. Rothenberg (1984, in press) reports two principal ways that homospatial thinking facilitates creativity in the area of psychotherapy. First, the production of metaphor helps therapists to provide patients with insights about their problems. For example, Rothenberg describes a therapist's use of the metaphor "She really gets under your skin, doesn't she?" as important in the treatment of a patient who was suffering from persistent outbreaks of skin inflamation. The metaphor, revivified by its application in this new setting, helped her to recognize anger that she felt toward her sister and mother. This recognition was reported to have been a turning point in the patient's treatment, as it coincided with a noticeable improvement in the patient's skin condition. The homospatial process entered into this situation when the therapist reportedly "fused word and image representations of 'skin,' 'defenses,' 'sister,' and 'patient,'" which directly led to the therapist's use of the metaphor.

The second aspect of the homospatial process leading to creative insights about patients' problems is that the process is perceived to facilitate empathic communication between the therapist and patient. Rothenberg (1984, in press) describes the process as follows:

> To apply homospatial thinking to the therapeutic circumstance involves the therapist conceiving of himself as occupying the same space as the patient. In so doing, the therapist conceives or imagines that he actually is sitting where the patient is. He superimposes himself upon the patient's spatial location. As homospatial conceptions may involve any and all of the sensory modalities, there may be visual, auditory, olfactory, tactile, gustatory and kinesthetic superimpositions. The therapist would thus conceptualize what the patient sees, hears, smells, tastes, and -- quite importantly -- how he moves.

The therapist's purpose in superimposing his or herself on the patient is to gain an enhanced understanding of the patient's perspective. While the therapist is fused with the patient he/she remains aware of his/her separate identity and views the world with more objectivity than the patient does. The homospatial empathic experience is a means of coming to insights about the patient's problems.

While there are distinct differences between the teacher-student and the therapist-patient relationship, there is reason to believe that a homospatial empathic process is an effective means which teachers employ or could employ to understand their interactions with students.

Two points should be made about what homospatial thinking is not. First, it is not analogical thinking, but rather a fusion of

whole entities, images, sensations, etc. It is not a stepwise or partial consideration of similarities between two or more entities -- distinct entities are actually brought together in the mind and fused (Rothenberg, 1979a, pp. 69-70). Secondly, homospatial thinking is not a form of hallucination, as the thinker is consciously aware of bringing the entities, sensations, etc., together and the thinker is aware of reality. Rather than the images simply existing in the mind of the thinker, the person can actually manipulate these images as opposed to being manipulated by the images.

In summary then, homospatial thinking is a conscious mental thought process in which the thinker conceives of two or more entities occupying the same space. One of the chief functions of the process is to make combinations and concretize ideas, concepts, and/or images. Through homospatial thinking discrete entities are superimposed or fused and their properties intermingle, this intermingling of properties helps the thinker to form new ideas and make new associations. Combinations made through the homospatial process frequently lead to the production of metaphors or the revivification of "dead" metaphors. One final function of the process is that it fosters empathic understanding.

Interplay Between Janusian and Homospatial Thinking

Janusian and homospatial thinking enable the creative thinker to transcend the dimensions of time and space. Rothenberg (1979a)

believes that escaping the limitations inherent in these two

dimensions is necessary for truly creative thought:

> The janusian conception is out of time or temporality
> and the homospatial conception is outside of space or
> spatiality. Operating within the creative process, the
> janusian and homospatial processes produce
> discontinuity--in time and space respectively. As cause
> is dependent on continuity in space and time, we seem to
> have come as close as possible to factors operating
> within the creative process that produce the disruption
> in causal connection and sequence, a disruption that is
> associated with the appearance of creations and of
> creativity. (p. 343)

Within the creative process, janusian and homospatial thinking

may occur concomitantly or separately and they may be employed

repeatedly as Rothenberg indicates:

> Actually, the temporal distinction made between
> inspiration and elabortion in the creative process is an
> incorrect one; these phases or functions alternate--
> sometimes extremely rapidly--from start to finish. Both
> janusian and homospatial thinking, therefore, operate
> during the long sequences of revising, shaping, and
> working out. (p. 346)

Janusian thinking generally occurs early in the creative process and

has primarily a separating function. Homospatial thinking primarily

has a unifying function, and it may occur throughout the process. The

following two quotations capture the sense of how Rothenberg sees the

interaction of the two processes.

> As janusian formulations usually lead up to an
> integration of antitheses and opposites--simultaneous
> operation or existence is not the same as unification or
> effective representation--homospatial thinking is
> frequently conjointly operative. Moreover, janusian
> constructs are intrinsically abstract; oppositions and
> antitheses are even more so. Homospatial thinking and
> other cognitive processes are required to render
> janusian constructs into apprehensible, concrete or even
> comprehensible entities. (p. 269)

Rothenberg describes how the two processes work together in the creation of a literary metaphor:

> When metaphors are developed from the encapsulation structure produced by the janusian process, the janusian and homospatial processes function concomitantly. By fusing and superimposing encapsulated elements and boundaries developed from janusian thinking, the homospatial process imparts integration and organic unity. In a sense, the homospatial process animates the boundaries and encapsulations derived from janusian formulations by integrating them within a larger whole, a particular or a general metaphor. The oxymoron type of literary metaphor, for example, "penniless rich palms" of Hart Crane, is an obvious example of the results of janusian and homospatial thinking operating close together. (pp. 366-367)

In conclusion, janusian and homospatial thinking are perceived by Rothenberg to play a critical role in the creative process. Janusian thinking frees the creative person from limitations of time and the homospatial process frees the person from spatial limitations. While both processes may work throughout the development of a creative idea, janusian thinking has, as a major function, to separate specific ideas out for investigation; later, or concomitantly, homospatial thinking is employed primarily to unify and combine ideas or concepts separated out in the janusian process.

Comparisons with Selected Theories

This subsection presents ten perspectives of other writers about the nature of the creative process. The similarities and differences between these other authors' views about creativity and Rothenberg's

janusian and homospatial thinking are discussed. The first seven
viewpoints considered here come from writers who have been mostly
concerned with explaining the process of creativity and not so much
concerned with the pedagogical implications of their work. The final
three perspectives are from writers who, while interested in
theoretical aspects, are mostly concerned with the practical aspects
of helping people to be more creative.

In presenting the first gorup, Koestler's theories of
"bisociation" and "holons" and their parallels to janusian and
homospatial thinking are first discussed. Next it is shown that
Kubie's idea of a creative preconscious has many similarities to
homospatial thinking, although Kubie and Rothenberg differ about the
consciousness level at which creative thinking occurs. Third, Kelly's
concept of constructive alternativism is shown to have some
interesting implications for a pervasive operation of janusian thought
processes. Fourth, Maslow's "self-actualized person" concept is
perceived to be highly consistent with Rothenberg's theory. Belth's
discussion of metaphor production is presented next and is shown to be
similar to Rothenberg's characterization of the homospatial process.
The two final authors who are presented in this group are Perkins and
Piaget, both of whom see creativity to be a function of ordinary
intellectual processes. For Perkins, creativity is a matter of
selection among alternatives. For Piaget, intellectual development is
a product of an individual's interactions with the environment, this
is a construction of novelties.

The final group of writers to be compared with Rothenberg have
tried to apply creativity theory and teach people techniques for being
more creative. The synectics approach of Gordon and Prince utilizes
various methods which would appear to encourage janusian and
homospatial thinking. Next, it is shown how Rothenberg's theory
relates to Guilford's "structure of the intellect" model. Finally,
the methods employed in deBono's "lateral thinking" are compared and
contrasted with janusian and homospatial thinking.

Selected Theories

Koestler's Creative Bisociation and Holons

Koestler (1964, 1967) coins two terms, "bisociation" and "holon"
to describe ways of thinking which have similarities to Rothenberg's
homospatial and janusian thinking. "Bisociation" as Koestler
describes it in The Act of Creation is discussed first. The process
of bisociation involves the coming together of two self-consistent but
habitually incompatible frames of reference (p. 35). At the point of
intersection of these two "planes" or frames of reference, an idea or
situation may be perceived as simultaneously existing in each of the
planes. For Koestler the uncovering or discovery of these
similarities, forming analogies, seeing the old in a new and relevant
context, is at the center of the creative act (pp. 119-120).

Koestler's and Rothenberg's theories share some common points --
sensory stimuli and/or mental conceptualizations are brought together,

combined and perceived simultaneously. For instance, Koestler's description of Archimedes "eureka act" bears marked similarities to homospatial thinking. He gives the following account and interpretation:

> Hiero, the tyrant of Syracuse and protector of Archimedes, had been given a beautiful crown, allegedly of pure gold, but he suspected that it was adulterated with silver. He asked Archimedes' opinion. Archimedes knew, of course, the specific weight of gold -- that is to say its weight per volume unit. If he could measure the volume of the crown he would know immediately whether it was pure gold or not; but how on earth is one to determine the volume of a complicated ornament with all its filigree work? Ah, if only he could melt it down and measure the liquid gold by the pint, or hammer it into a brick of honest rectangular shape, or ...and so on....
>
> One day, while getting into his bath, Archimedes watched absent-mindedly the familiar sight of the water-level rising from one smudge on the basin to the next as a result of the immersion of his body, and it occurred to him in a flash that the volume of the water displaced was equal to the volume of the immersed parts of his own body -- which therefore could simply be measured by the pint. He had melted his body down, as it were, without harming it, and he could do the same with the crown.
>
> ...No doubt he had observed many times that the level of the water rose whenever he got into it; but this fact, and the distance between the two levels, was totally irrelevant to him -- until it suddenly became bisociated with his problem. At that instant he realized that the amount of rise of the water-level was a simple measure of the volume of his own complicated body.
>
> The discovery may now be schematized as follows...:
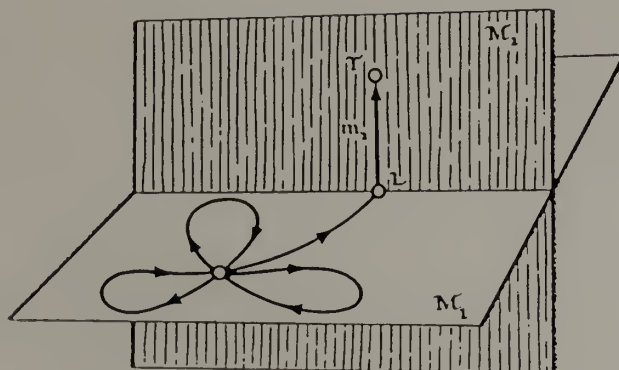
M_1 is...governed by the habitual rules of the game, by which Archimedes originally tried to solve the problem; M_2 is the matrix of associations related to taking a bath; m_2 represents that actual train of thought which effects the connection. The Link L may have been a verbal concept (for instance: 'rise of water-level <u>equal</u> melting down of my solid body'); it may equally well have been a visual impression in which the water-level was suddenly seen to correspond to the volume of the immersed parts of the body and hence to that of the crown --whose image was constantly lurking on the fringes of his consciousness. The essential point is, that at the critical moment <u>both</u> matrices M_1 and M_2 were simultaneously active in Archimedes mind--though presumably on different levels of awareness. (pp. 105-107)

The bisociation of the two planes of reference and the "link L" between the "rise of water-level <u>equals</u> melting down of my solid body" would constitute a process similar to homospatial thinking if Archimedes actually fused images of the rising water level due to the immersed body with images of the crown being immersed. Koestler's analysis is not specific on this point, he says the "water-level was seen to correspond to the volume of the immersed parts..." It may be inferred that he means that these images are actually occupying the same space, as the schematic drawing implies, however, it is equally possible to infer that parts of the concepts are seen to "correspond" in a stepwise analogic fashion. A case could be made for either interpretation.

In another instance, Koestler talks of art and humor as operating "...primarily through the transitory <u>juxtaposition</u> of matrices.... Laurence Olivier in <u>Hamlet</u> is perceived as Olivier and as Hamlet at the same time..." (p. 658). This description, however, implies more than a "juxtaposition of matrices," the statement that Olivier could be perceived as both Hamlet and Olivier at the same time

implies that both occupy the same space -- a homospatial conceptualization.

In a more recent presentation of his theory Koestler (1967) refines his definition of "bisociation" and introduces the concept of "holon."

> Bisociation means combining two hitherto unrelated cognitive matricies in such a way that a new level is added to the hierarchy, which contains the previously separate structures as its members. (p. 183)

The reference to "hierarchy in this definition pertains to his view that "the matricies" are hierarchically organized into wholes, whole-parts, part-wholes, and parts. The intermediate "sub-wholes" are called "holons." The term comes from the Greek "holos" meaning "whole" and the suffix "on" meaning "particle or part." In reality Koestler states that the whole-part hierarchy is open-ended, extending in either direction toward infinity.

> A "part," as we generally use the word, means something fragmentary and incomplete, which by itself would have no legitimate existence. On the other hand, a "whole" is considered as something complete in itself which needs no further explanation. But "wholes" and "parts" in this absolute sense just do not exist anywhere, either in the domain of living organisms or in social organizations. What we find are intermediary structures on a series of levels in an ascending order of complexity: sub-wholes which display, according to the way you look at them, some of the characteristics commonly attributed to wholes and some of the characteristics commonly attributed to parts.... Phonemes, words, phrases, are wholes in their own right, but parts of a larger unit; so are cells, tissues, organs; families, clans, tribes. The members of a hierarchy, like the Roman god Janus, all have two faces looking in opposite directions: the face turned towards the subordinate levels in that of a self-contained

whole; the face turned upward towards the apex, that of
a dependent part. One is the face of the master, the
other the face of the servant. This "Janus effect" is a
fundamental characteristic of sub-wholes in all types of
hierarchies. (Koestler's emphasis, p. 48)

The "holon," then as Koestler indicates is a "sub-whole" that exhibits

attributes of both "whole" and "part," in a "Janus effect." Koestler

further indicates that the matrices which are fused and juxtaposed in

bisociation are composed of cognitive holons:

In The Act of Creation, I proposed the term "matrix" as
a unifying formula to refer to...cognitive structures,
that is to say, to all mental habits and skills governed
by a fixed set of rules but capable of varied strategies
in attacking a problem. In other words, matrices are
cognitive holons and display all the characteristics of
holons... (p. 182)

The holon constructed through a "janus effect" appears very

similar to the janusian conceptualizations described by Rothenberg in

that opposites are recognized as existing side-by-side. Bisociation

appears to correspond to Rothenberg's homospatial process in that

dissimilar frames of reference are fused. However, Koestler (1967)

characterizes bisociation in different settings as a "collision of

matrices," "fusion," and "juxtaposition." He believes that

bisociation operates differently in humor, science, and art. He calls

laughter in humor the "HAHA" reaction, scientific discovery the "AHA"

reaction, and artistic appreciation the "AH..." reaction (pp.

184-191). He generalizes that:

The HAHA reaction signals the collision of bisociated
contexts, the AHA reaction signals their fusion, the AH
reaction their juxtaposition. (p. 193)

The distinctions between the three, he says, are a result of temporal variances in the way they are experienced; the differences are a matter of degree and cannot be strictly differentiated between the various reactions.

In comparisons with Rothenberg's theories, there are several differences which are noted. First, as indicated above bisociation, although similar to homospatial thinking is a broader concept. In addition to fusion of discrete entities or frames of reference, bisociation can come about through "juxtapositions" or "collisions of frames of reference." Along these lines bisociation is variously characterized as an analogical process of simultaneously seeing similarities between incompatible planes of thought, and also as a process of equating and fusing aspects of incompatible planes of thought. Rothenberg differentiates between these two processes and specifies that homospatial thinking is more than a partial comparison of similarities, it is a fusion of distinct entities, not an analogical process.

Another difference between bisociation and homospatial thinking is that in bisociation the planes of thought, matrices, etc., are fused or juxtaposed and their properties are "shaken together" or combined in some way. In homospatial thinking discrete entities or sensations are perceived to occupy the same space.

Third, Koestler frequently associates bisociation and holons with unconscious as well as conscious thought processes. Whereas janusian and homospatial thinking are conceived as being active,

conscious thought processes that may serve the thinker in helping bring unconscious thoughts to the thinker's level of consciousness.

Finally, holons which are produced through a "Janus effect" are in most aspects the same as conceptualizations formed through janusian thinking. Opposites are perceived to operate simultaneously side by side in both accounts. Aside from the issue of level of consciousness mentioned above, the chief difference in the conceptions is Rothenberg's focus on the contrasting elements and his emphasis on the importance of janusian conceptualizations in the separation aspect of the creative process. On the other hand Koestler focuses on the concept that "partness" and "wholeness" are both present in all social, biological and conceptual systems.

In summary, the theories presented by Koestler and Rothenberg appear to be similar in several respects. The simultaneous fusion of incompatible frames of reference in bisociation bears marked resemblance to superimposed or fused discrete entities in homospatial conceptualizations. Secondly, Koestler's description of the "Janus effect" in the production of holons appears to function in the same way and to serve the same separating effect as does Rothenberg's janusian thinking. A precise differentiation between the two theories is made difficult in that the two theorists present their ideas at different levels of specificity. Koestler's descriptions covers a broader scope and are more general in nature than those of Rothenberg.

Kubie--Freeing the Creative Preconscious

For Kubie (1958) creative thinking is primarily the result of preconscious mental process. He perceives that the mind functions simultaneously on three levels: a "conscious" waking state that deals with "communicable ideas and approximate realities"; an "unconscious" where meanings are disguised and condensed into symbols -- these are often conflict laden and difficult to bring to the conscious level; and the "preconscious" which deals swiftly with symbols, images and other sensory information. The preconscious is a level between consciousness and unconsciousness; information at this level can be made accessible to the conscious with varying degrees of self-examination (p. 34).

Kubie indicates that fixated or "anchored" patterns of behavior on the conscious and unconscious levels impede the free functioning of the preconscious and therefore, creativity:

> Preconscious processes are assailed from both sides.
> From one side they are nagged and prodded into rigid and
> distorted symbols by unconscious drives which are
> oriented away from reality and which consist of rigid
> compromise formations, lacking in fluid inventiveness.
> From the other side they are driven by literal conscious
> retrospective critique. The uniqueness of creativity,
> i.e., its capacity to find and put together something
> new, depends on the extent to which preconscious
> functions can operate freely between these two
> ubiquitous concurrent and oppressive prison wardens.
> (p. 45)

A major thrust of his work is aimed at freeing the preconscious, and encouraging people to become aware of conscious and unconscious patterns which inhibit and block growth and creativity. The following

quotation indicates how Kubie envisions the operation of a "free"
functioning preconscious.

> In the adult who is not hamstrung by conscious and
> unconscious fear and guilt, preconscious processes make
> free use of analogy and allegory, superimposing
> dissimilar ingredients into new perceptual and
> conceptual patterns, thus reshuffling experience to
> achieve that fantastic degree of condensation without
> which creativity in any field of activity would be
> impossible. In the preconscious use of imagery and
> allergory many experiences are condensed into a single
> hieroglyph, which expresses in one symbol far more than
> one can say slowly and precisely, word by word, on the
> fully conscious level. (p. 34)

Kubie elaborates further on the two major functions that he perceives
the preconscious to perform -- selecting and combining.

> The free play of preconscious process accomplishes two
> goals concurrently: it supplies an endless stream of
> old data rearranged into new combinations of wholes and
> fragments on grounds or analogic elements; and it
> exercises a continuous selective influence not only on
> free associations, but also on the minutiae of living,
> thinking, walking, talking, dreaming, and indeed every
> moment of life. (p. 39)

One major similarity and several stark differences can be found
between Kubie's and Rothenberg's characterization of creative
thinking. The major similarity is that both indicate that
"superimposition" of dissimilar concepts or images is an important
means of generating new combinations. The major differences in the
viewpoints of the two authors involves Rothenberg's placement of
janusian and homospatial thinking under the aegis of conscious
processes -- Kubie places such activity in the preconscious. This
distinction produces many eddies of conceptual differentiation.
Rothenberg (1979a) does not ascribe a role for the "preconscious"

level in the presentation of his theory, however, the distinctions he
draws between homospatial thinking and primary process (unconscious)
thinking offer some clarification:

> This primary process feature of spacelessness is
> mirrored in consciousness by homospatial thinking. Both
> operate to defy the ordinary restrictions of space but
> they function in a reverse cognitive and psychodynamic
> manner. The primary process characteristic functions to
> express wishes in concealed form, while homospatial
> thinking functions to unearth and reveal unconscious
> material as well as to integrate and unite concrete
> entities to produce both metaphors and abstractions. In
> homospatial thinking, discrete entities are usually
> superimposed and vague when occupying the same space; in
> dreams, entities need to be brought together as vivid
> composits, that is, combinations and compromise
> formation takes place.... With condensation in primary
> processes , multiple entities are brought together and
> compressed in order to discharge impulses in a
> concealed, distorted way. (pp. 316-317)

The above helps to clarify a confusion that may be as much a
result of semantic inconsistency as it is a functional difference
between the two authors. One function of both homospatial thinking and
preconscious creativity appears to be the same -- to make new
connections. However, Kubie, it will be remembered, does not perceive
that superimposing occurs at the conscious level of awareness. The
source of the confusion suggested by this is that Kubie and Rothenberg
appear to have different conceptions of what constitutes conscious
thought. Rothenberg appears to include much of what Kubie calls the
"preconscious" in the realm of conscious thought.

A second area of confusion centers around Kubie's use of the
word "condensation." It is a word that he uses in describing
operations at all levels of consciousness and the word takes on

qualitatively different meanings on each level. In the preconscious "condensation" does not appear to have the concealing and distorting effects which Rothenberg attributes to the word as it operates in the unconscious. If Kubie did intend his use of the word to have the meaning attached to it that Rothenberg did then there are indeed differences in their conceptualizations. However, if the term was just loosely used by Kubie to refer to combining dissimilar elements then the two authors would be in far more agreement than it would appear of the surface.

A final point of differentiation between the two theories is that Kubie includes analogy and allegory as important means of making new conceptual patterns, while Rothenberg stresses the importance of going beyond step-wise analogic comparisons. Fusion and superimposition of discrete entities are essential to the homospatial process.

It may be concluded that Rothenberg and Kubie agree that an important part of the creative process is the superimposition of "dissimilar ingredients" to use Kubie's terms or "discrete entities" to use Rothenberg's. There do appear to be several differences in the perspectives of the two writers, for instance, Kubie places more emphasis on analogy and allegory formation in the creative process than does Rothenberg, but the chief difference is Kubie's emphasis on the preconscious as the main level where creative combinations occur. Rothenberg indicates that janusian and homospatial thinking are conscious thought processes.

Kelly's Constructive Alternativism

Kelly (1955) states: "...man creates his own way of seeing the world in which he lives, the world does not create them for him. He builds constructs and tries them on for size. His constructs are sometimes organized into systems, groups of constructs which embody subordinate and superordinate relationships" (p. 12). This view is similar to Koestler's perspective about holons which was presented earlier. Kelly goes on to say:

> Constructs are used for predictions of things to come, and the world keeps rolling along and revealing these predictions to be either correct or misleading. This fact provides the basis for revision of constructs and, eventually, of whole construct systems. (p. 14)

Basic to Kelly's position is the idea that no absolute constructions of the world are possible -- we only come to know reality through a series of "successive approximations." He takes the stand that:

> ...there are always some alternative constructions available to choose among in dealing with the world. No one needs to paint himself into a corner; no one needs to be completely hemmed in by circumstances; no one needs to be the victim of his biography. We call this philosophical position constructive alternativism. (p. 15)

Unfortunately, many people operate as if they were working in closed systems. The net result is that they are held hostage by sets of obsolete theories. These problems can be avoided by developing as part of a self-regulatory system as attitude of constructive alternativism (p. 15). This means using a "permeability/preemptive" construct. Using this construct, persons examine the degree to which

their construct systems are open (permeable) or closed (preemptive) to the prospect of revision.

The aspect of Kelly's theory most relevant to this discussion is that he sees constructs as being dichotomous in nature: "A person's construct system is composed of a finite number of dichotomous constructs" (p. 59). He describes these constructs as follows:

> The [dichotomous] construct denotes an aspect of the elements lying within a range of convenience, on the basis of which some of the elements are similar to others and some are in contrast. In its minimum context a construct is a way in which at least two elements are similar and contrasting a third. There must therefore be at least three elements in the context. There may of course be many more. "p. 61)

If, as Kelly contends, all of our concepts are inherently dichotomous, then janusian thinking has the potential of being very pervasive. Kelly indicates that in every concept that we have about the world, "gentleness" as an example, a corresponding opposite or set of opposites is implied -- in this case, "aggressiveness," or "not gentle," or other similar opposing elements. If no opposing element existed to contrast with "gentleness" then "gentleness" would have no conceptual value.

Along a similar vein, Kelly points out that each of a person's predictions about the world always imply both a positive and a negative forecast: "To say that one thing will happen is also always to say that certain other things will not happen" (p. 124). To say that it will rain, for instance, implies that it will not be fair.

Kelly's observations presented above, are interesting in that they suggest people have a natural tendency to think in terms of opposites, not just in polarized fashions, but in relativistic ways with multiple oppositions possible. That people naturally tend to juxtapose opposites or antitheses due to the dichotomous nature of mental constructs further suggests a simultaneous aspect in the conceptualization of opposites. Mental constructs as Kelly describes them are similar to Koestler's "cognitive holons" in the relativistic nature of conceptualization of opposites and in that opposites are brought together. In addition, Kelly's mental constructs could be construed as the embodiment of a janusian conceptualization -- almost. Although the elements of simultaneous conceptualization of opposites or antitheses appear to be present, one essential matter remains and that is that opposites in a janusian formulation are seen as being equally true and operative simultaneously -- they do not negate or cancel one another out. Whether or not this final point is part of Kelly's theory is unclear as he does not specifically address this issue.

A closing point in this discussion of Kelly's work is that the dichotomous nature of peoples' constructs lends at least some indirect support for Rothenberg's view that the simultaneous juxtaposition of equally operative, yet opposing or antithetical elements is more than just possible -- it may be characteristic of much of our thinking.

Maslow's Self-Actualized Person

Creativity for Maslow (1968) is closely related with his notion of the self-actualized person (p. 137). One of the main characteristics of his "self-actualized" (SA) creative person is their ability to resolve dichotomies. He says:

> My subjects had put opposites together in such a way as to make me realize that regarding selfishness and unselfishness as contradictory and mutually exclusive is itself characteristic of a lower level of personality development. So also in my subjects were many other dichotomies resolved into unities.... They [great statesmen, philosophers, parents and inventors] are all integrators, able to bring separates and even opposites together into unity. We speak here of the ability to integrate and of the play back and forth between integration within the person, and his ability to integrate whatever he is doing in the world. To the extent that creativeness is constructive, synthesizing, unifying and integrative, to that extent does it depend in part on the inner integration of the person. (pp. 139-140)

One important parallel here between Maslow's work and Rothenberg's is that in the "self-actualized" person like the janusian thinker brings opposites together. It is not however, the function of janusian thinking to resolve the opposites or integrate them, but as was indicated earlier to serve as a way station for integration of separate entities into unities through dialectical or homospatial processes. Maslow does not separate out these specific mental processes which the self-actualized person uses, but his statements imply them -- that persons separate information "even opposites" suggests a janusian process; and "integrates" these "into unities," perhaps through a homospatial process.

Another aspect of Maslow's (1971) conceptualization of the inspirational phase of the creative process is that in "creating," time and space are transcended:

> ...the creative person, in the inspirational phase of the creative furor, loses his past and his future and lives only in the moment. He is all there, totally immersed, fascinated and absorbed in the present, in the current situation, in the current here-now with the matter in hand. Or to use a perfect phrase from The Spinster by Silvia Ashton-Warner, the teacher absorbed with a new method of teaching reading to her children says, "I am utterly lost in the present." This ability to become lost in the present seems to be a "sine qua non" for creativeness of any kind. But also certain "prerequisites" of creativeness -- in whatever realm -- somehow have something to do with this ability to become timeless, selfless, outside of space, of society, of history. (p. 61)
>
> It is always described as a loss of self or of ego, or sometimes as a transcendance of self. There is a fusion with the reality being observed...a oneness where there was a twoness, an integration of some sort of self with the non-self. (p. 62)

A noteworthy aspect of the description given above is that it parallels closely Rothenberg's view that in creating, individuals must be able to move beyond the bonds of causality -- to transcend time and space by the respective means of janusian and homospatial thinking. One further similarity is that Maslow's statement that there is a "fusion," where the individual integrates the "self with the non-self" is highly suggestive of Rothenberg's empathic homospatial process.

In summary, Maslow's view of creativity in the self-actualized person is quite consistent with Rothenberg's account of creativity in the eminent individuals he has studied. Time and space are transcended, opposites are brought together in ways which are not

mutually exclusive, and fusions of the self and the non-self occur.
In that Maslow gives a more general account of the creative process it
is difficult to make a more detailed comparison of the views of the
authors, but those similarities which have been pointed out are quite
striking.

Belth -- On Metaphor

In his description of metaphor formation, Belth (1977) offers a
description of a process which is very similar to Rothenberg's
homospatial thinking. Belth begins his discussion of metaphor with
the following statement:

> By "laying" one context of knowledge over another, new
> knowledge, new perceptions, and new expressions become
> possible. (p. 74)

He sees "laying" one context of knowledge over another as the essence
of metaphor. It is through metaphor, he believes, that one is able to
create unities, integrate fields of knowledge, and create new
information. Belth states that the "act of constructing models,
analogies and metaphors" is common to all fields of inquiry.

> This commonality lies, not in the specific models or
> metaphors used, but in the act of constructing models,
> analogies, and metaphors for the general purpose of
> extending knowledge and understanding, and for the
> specific purpose of adding to knowledge of the world of
> things and ideas.
>
> This is the primary, overarching function of metaphor
> making, as apparent in common-sense inquiry as it is in
> the most advanced sciences, that "gases are collections
> of mindless, moving particles" is as much a metaphor as
> is the sentence "Books are windows on the world." "The
> moon is a ghostly galleon tossed upon cloudy skies" is

no more metaphoric than "those clouds hiding the moon
promise rain tomorrow." All show evidence of two
contexts laid one upon the other, the events of one
perceived within the context of the other. (p. 84)

Through metaphor, he contends that similarities are created "rather
than simply laying bare some assessed preexisting similarity." He
adds:

> But this must not be read to mean that one is simply
> imposed upon the other in some whimsical manner.
> Rather, it is a similarity created in the creation of an
> integrated larger context of consideration, in which the
> two separate languages are made integral, and the vision
> that derives shows the heretofore separate matters as
> one. (p. 84)

The unifying process which Belth talks about appears to be
nearly identical to Rothenberg's process of homospatial thinking. The
overlaying of one context on another corresponds to Rothenberg's
belief that separate entities are fused or superimposed in the
production of metaphors. It is also clear that both authors regard
metaphor production as a creative activity. According to Belth, every
metaphor creates new ways of seeing the familiar.

> So metaphoric expressions make possible new information
> and knowledge. But they do something more. They allow
> us to see new dimensions in the already familiar. This
> is why it is said that by means of metaphors, we create
> re-descriptions. Tacitly understood elements of both
> domains, now seen in the overlay, become more explicit
> in the transaction, in the reorganization, which
> emphasizes and deemphasizes different elements of the
> familiar. (p. 85)

It is concluded, that both Belth and Rothenberg have very
similar views about how combinations occur in the creative process.
Both also seem to agree that "overlaying" or "superimposing" of

"contexts of knowledge" or "discrete entities" is common to all fields of inquiry and expression.

Perkins -- Creativity as Selecting

Perkins (1981) sees Rothenberg's janusian thinking as a particular "style" of thinking and not as a particular ability which individuals possess (p. 270). In fact, Perkins seriously questions whether any particular creative abilities exist. He believes that people have orientations that predispose them to marshal general abilities to produce creative ends (p. 247). In essence, Perkins sees creating "as a process of gradually selecting from an infinity of possibilities an actual product" (p. 276). The selecting process involves four basic "moves": (1) "planning" a means to an end; (2) "abstracting" plans from work that is in progress -- going from particulars to general ideas; (3) "undoing" previously completed work and redoing it -- this is somewhat the reverse of selecting; and (4) "making means into ends" which involves solving problems that present themselves while en route to the solution of the original problem. The four moves are seen as being held together by the desire to achieve some worthwhile purpose (pp. 276-281).

The viewpoints taken by Perkins and Rothenberg in describing creativity are very different. For Perkins, creativity is the result of ordinary mental processes applied toward creative purposes. In contrast, Rothenberg sees homospatial and janusian thinking as essential to the appearance of truly creative production. Yet despite

this difference in perspective, Perkins does not appear to contradict Rothenberg's assertions about the presence of janusian and homospatial thinking. The four moves involved in Perkins' "selecting" view of creativity are general activities which must rely on some underlying psychological processes; presumably, janusian and homospatial thinking may be among these underlying processes.

Piaget's Equilibration Theory

Over the course of his extensive writings Piaget gave little special attention to the topic of creativity; however, in a recently published speech (Gallagher & Reid, 1981) he briefly takes up the topic. Speaking about the sources or causes of creativity he says:

> It is very clear that this is wrapped in mystery; indeed some individuals are clearly more creative than others. Other individuals are much less creative, but it is certainly not just a matter of genius. (p. 221)

In Piaget's view of cognitive development everyone is capable of creative production. Through interactions with the environment the individual is seen as constructing "novelties." For Piaget, each new discovery that individuals make about the world are acts of creativity -- however modest these may be. He states:

> The development of intelligence is a continuous creation. Each stage in the development produces something radically new, totally different from what was there before. And the whole development is characerized by these appearances of totally new structures. (p. 223)

While the source of creativity may remain a mystery to Piaget, he sees each individual as the creative producer of novel ideas. The process by which this is done is a normal process which is possessed by all individuals. Within his equilibration theory he attributes creative production of novelties to a process called "reflexive abstraction." Before explaining this term, an overview of the equilibration theory is in order.

Piaget (1960) sees intellectual growth and development as an adaptive process resulting from an individual's actions on the environment. Adaptation is seen as an active and dynamic interplay of two complementary processes: assimilation and accommodation. Mental assimilation is a process of incorporating information from the environment into the individual's existing patterns of behavior (schemata). Its complement, accommodation, is a process by which the environment acts upon the individual causing the person to reorganize their existing behavior patterns. Equilibration refers to the dynamic regulation of these two complementary processes. Adaption is discribed as: "...an equilibrium between assimilation and accommodation, which amounts to the same as an equilibrium of interaction between the subject and the object" (p. 8).

As individuals develop they are seen as tending toward higher levels of equilibrium, expanding and modifying their mental concepts or "schemata" to better account for the diversity of experience encountered in the world. In essence all mental growth is achieved through the simultaneous interaction of accommodation and assimilation

regulated by a dynamic equilibration process. An important aspect of equilibration is a process called reflexive abstraction. It operates in equilibration processes which require the individual to make inferences.

The importance of "reflexive abstraction" for creativity is very clear, Piaget (1981) states: "...all acts of intellectual creativity are processes of reflexive abstraction" (p. 225). The process requires individuals to reflect on their actions and the effects of these actions on the environment not merely to abstract from objects; reflexive abstractions are seen as a means by which ideas can be reconstructed, not just reproduced, at a higher level of understanding. Piaget explains:

> ...In this sense one is not just reflecting onto higher level, but one is reconstructing on a higher level what already existed on a lower level. Now the higher level is always a wider, more all-embracing field, so that when one reflects onto a higher level, it is incumbent upon one to enrich it with new elements. So you have to enlarge it as well as transpose it on the second level. (p. 225)

To put this into other words, "novelties" are constructed by individuals as they reflect on information they hold at lower levels, and this reflection leads to a restructuring of knowledge at a higher level in which the previously held ideas are transformed and expanded to account for new information. An example of this process comes from Piaget's early writings.

Piaget (1951) presents an episode illustrating how Lucienne, age 1 year, 4 months invents a means of opening a slit in a box to obtain a wanted item:

...she puts her finger inside the box and gropes to reach the chain, but fails completely. A pause follows during which Lucienne manifests a very curious reaction bearing witness not only to the fact that she tries to think out the situation and to represent it to herself through mental combination the operations to be performed, but also to the role played by imitation in the genesis of representations. Lucienne mimics the widening of the slit.

She looks at the slit with great attention; then, several times in succession, she opens and shuts her mouth, at first slightly, then wider and wider! Apparently Lucienne understands the existence of a cavity adjacent to the slit and wishes to enlarge the cavity. The attempt at representation which she thus furnishes is expressed plastically, that is to say, due to inability to think out the situation in words or clear visual images, she uses a simple motor indication as "signifier" or symbol.... Lucienne, by opening her mouth thus expresses, or even reflects her desire to enlarge the opening on the box. This schema of imitation, with which she is familiar, constitutes for her the means of thinking out the situation. There is doubtless added to it an element of magic-phenomentalistic causality or efficacy. Just as she often uses imitation to act upon persons and make them reproduce their interesting movements, so also it is probable that the act of opening her mouth in front of the slit to be enlarged implies some underlying idea of efficacy.

Soon after this phase of plastic reflection, Lucienne unhesitatingly puts her finger in the slit and, instead of trying as before to reach the chain, she pulls so as to enlarge the opening. She succeeds and grasps the chain. (pp. 337-338)

This example illustrates Lucienne's mental combination of discrete entities in the solution of a problem. What she recognizes through an action of reflexive abstraction is that her existing schemata of "open wider, makes hole bigger" as expressed physically through mouth opening movements, is extended and transformed at a higher level of understanding to include the concept of opening the box wider and making the box's hole bigger. In other words it can be

said that she assimilated the concept of open the box wider to make the hole bigger into her existing concept of open wider to make hole bigger and that this new connection of ideas requires a simultaneous restructuring of her initial concept. Lucienne made, what for her, was a novel construction. This came about through her reflection on the abstracted similarities which she perceived existed between the initially discrete entities.

For Piaget, then creativity is an ordinary phenomenon not differentiated from intellectual development in general. The construction of novelties by individuals occurs through a dynamic equlibrium between the processes of accommodation and assimilation with reflexive abstraction playing a key role in this process. While Piaget has paid little attention to the area of creativity as a special case of intellectual activity, Feldman (1980) has applied aspects of his work to a theory of creativity.

Feldman (1980) believes that Piaget's theories of cognitive development have important implications for understanding creative behavior. He indicates that any type of cognitive advance by an individual will fall on a continuum of ideas from ones that are "universal" to those that are "unique." Universal ideas are those which are held by a society in general, and at the other end of the continuum, unique ideas are ones totally new to the society. In Feldman's view of creativity, "...the same conditions that describe the equilibration process for general cognitive development advance pertain to unique advances as well" (p. 110). In other words all

ideas produced through the equilibration process are novel to the individual, those which society regards as being more creative are simply more unique. Feldman's conception is highly consistent with Piaget's perspective and is a useful perspective for viewing Piaget's work from a creativity standpoint.

Relating Piaget's theories of equilibration back to Rothenberg's theories of janusian and homospatial thinking, it appears that there is agreement that <u>conscious</u> thought processes are responsible for the mental combinations necessary for production of novel ideas. The precise psychodynamics of "reflexive abstraction" are not specific enough in Piaget's account to explain exactly how sensory images are brought together and perceived by the mind. For instance, the example of Lucienne's invention leaves open to speculation whether she may have superimposed sensory images in homospatial thinking style as she brought together her schemata of opening wider makes hole bigger, with images of the box opening wider. The theories do not appear to conflict but may, indeed, complement one another.

Juxtaposition of opposites are not a part of Piaget's model, however it is interesting to note that the equilibration theory is built around a janusian thinking type of conceptualization in which two opposing processes, assimilation and accommodation are juxtaposed in a dynamic balance in which both are true and operative at the same time. It is tempting to speculate that janusian thinking may have been employed in the development of the equilibration theory. One final point, not addressed until now, is that Rothenberg would contend

that young children would not be capable of high levels of creative thinking. Piaget, on the other hand, would claim that the most creative time of development for an individual is during the period of early childhood. He believes that young children continually use the process of reflexive abstraction, the key element in creative intelligence.

Applications of Creative Theory

Several writers have developed strategies for applying creative theory to actual learning situations. Gordon and Prince's "synectics," Guilford's "Structure of the Intellect" model, and deBono's "lateral thinking" are described in turn and compared with Rothenberg's theory.

Gordon and Prince -- Synectics

Synectics is a creative problem-solving technique that, according to Prince (1970) "has developed two basic and interrelated approaches: First, procedures that lead to imaginative speculation; second, disciplined ways of behaving so that speculation is not cut down, but valued and encouraged" (p. 9). To encourage imaginative speculation, the methodology involves use of: (1) forming analogies, (2) juxtaposing opposites, and (3) "force fitting" dissimilar concepts or objects. Other techniques are used in the process but the above three have the most relevance to this discussion.

Forming "personal analogies" is frequently a part of the synectics process. The aim of the activity is to help people look at problems, concepts or ideas in a strange new context. The person is asked to actually imagine becoming something else. Prince gives the following example:

> Leader's Question (Personal Analogy): You are a tuning fork. How do you feel?

> Response: My nerves are shot. Here I am, a high-grade piece of steel, and when the right tone sounds, I have a breakdown! But I am intensely responsible and narrow-minded. Dead to anything until "my" frequency comes around and then WOW! (p. 97)

Such empathic identification is perceived to help a person gain a better understanding of the attributes, perspectives, or feelings of something else. This enables the person to be a more effective problem solver. The personal analogy is not role playing, the person is actually encouraged to become the thing. This formation appears to be identical to Rothenberg's "creative empathy" using homospatial thinking although his discussion is limited to fusion with another person. What seems to distinguish "personal analogies" from homospatial thinking is that whole entities are fused in the latter; while the term "analogy" in "personal analogies" suggests that likenesses or only partial similarities are involved in this process. However, the example presented above and the characterization of the process as having the person become the thing suggests that "personal analogy" is a misnomer -- it's really a personal metaphor. A final point on this subject is that Rothenberg would stipulate that the

person retains his/her identity during the fusion with something else -- this is not explicitly stated by Prince, but appears to be taken for granted.

The second technique is what Gordon (1973) calls "compressed conflict." In this technique, opposing elements are juxtaposed to capture the essence of a thing or an underlying paradox. Compressed conflicts usually take the form of an oxymoron -- a noun modified by an adjective with opposite meaning, such as "confused clarity," or "furious calm" (p. 238). The juxtaposition of opposites in a compressed conflict suggests a strong relationship to janusian thinking. Janusian thinking could certainly be employed to form a compressed conflict, however, a stepwise consideration of opposites might as easily produce the same sort of result. Gordon and Prince appear to be more concerned with the compressed conflict as product, and do not describe the precise method by which it is formed. For this reason, it is difficult to get an exact measure of how this aspect of synectics differs from janusian thinking. However, the resultant product of a compressed-conflict, "furious calm," for example, encourages the reader to actively and simultaneously conceive of opposites in a janusian manner.

The third mechanism designed to promote speculative imagination is "force fitting." This process usually involves a series of steps in which objects, metaphors, or concepts may be brought together and similarities are found between radically different things (Prince, 1970, pp. 98-105). Metaphoric analogy equations are frequently

employed in this process. An example of this would be, given the problem of devising an ice cube tray in which the ice cubes would not stick, compare the ice cube tray to a bee hive. The equation resulting from this comparison would look as follows:

$$\frac{Wax}{Bee\ Hive} = \frac{?}{Ice\ Cube\ Tray}$$

Comparisons of the two dissimilar things are intended to promote new or surprising associations.

Force fitting resembles homospatial thinking in that the process implicitly encourages people to perceive something in a radically different way. While homospatial thinking could be used in making connections in a force fitting exercise, the process of force fitting rests primarily on making partial comparisons, seeing similarities, but not actually fusing and superimposing entities as in homospatial thinking.

A major difference between the whole synectics approach and janusian and homospatial thinking is that in all of the activities of synectics, the "preconscious" is perceived to play a major role in making associations in information. Rothenberg, in contrast, places these activities at the level of consciousness. If Rothenberg and Gordon and Prince could agree to place certain activities such as forming "personal analogies" and homospatial thinking on the same level of consciousness, then aspects of their conceptualizations could be perceived as identical.

Guilford's Structure-of-Intellect Model

Guilford's (1977) Structure-of-Intellect Model is a three-way classification system of the known and conceivable human intellectual abilities or functions; 150 possible unique abilities are presented in the model. The categories of the model which are most relevant to creative thinking, according to Guilford, are divergent production and product transformation. The first process -- "divergent production" -- involves a broad search for information from the memory store that may be applied to a particular given situation. Essentially, it aids creative thinking by providing access to a variety of alternatives that may be useful in dealing with a particular situation (p. 108).

The second process, "transformations," occurs when there are changes in any kind of information (p. 37). Guilford indicates that transformations may be of a figural, symbolic, semantic and/or behavioral nature. He gives an example of a symbolic transformation that requires reading words spelled backwards: "elcric a ward" after being properly transformed reads as "Draw a circle" (note punctuation was omitted from the initial set of words to avoid giving special clues) (p. 38). As an illustration of semantic transformations he offers several puns: "College bred means a four-year loaf made from the old man's dough" (p. 39). Puns, he indicates, require shifts or substitutions of meanings which can be humorous or surprising. Semantic connections related to objects are also subject to transformations.

> The recognized use of an object is semantic information.
> Children often define objects in terms of their
> customary uses -- pillows are to sleep on, hammers are
> to pound with, paper is to write on, and so forth.
> Transformations occur when objects are adapted to some
> new use, as when a screwdriver is used as a bandleaders
> baton, a book is used to hold up a window, or a pencil
> is used to punch holes. (p. 40)

Transformations are not limited to the kinds of examples
presented above -- they "may occur in any content area, also in other
kinds of products" (p. 37). Guilford does not give specific
information about the nature of the thought processes required to make
the transformations or the divergent productions which he describes.
It is entirely possible that janusian, homospatial, and other thought
processes could be underlying processes in divergent production and
transformations. Janusian thinking, for instance, could produce
certain types of reversals and homospatial thinking could produce the
types of semantic transformations described by Guilford.

deBono's Lateral Thinking

In discussing ways to stimulate creative thinking, deBono (1970)
juxtaposes two means of thinking: vertical and lateral thinking. The
former is a linear, stepwise, orderly thinking process -- a logical
thinking process. Lateral thinking, on the other hand, is a process
of generating new ideas, challenging assumptions, and changing
attitudes; it is characterized as both a means of handling information
and as an attitude. The two processes are seen to be complementary,
lateral thinking is a means of generating new approaches and vertical

thinking is a means of developing and elaborating the new approaches. For the purpose of this discussion the focus here will be on lateral thinking.

Lateral thinking is a non-sequential process which seek to bring about provocative arrangements of information. To accomplish this, deBono suggests various techniques, such as: brainstorming, forming analogies, fractionation (separating existing patterns), reversal, and suspending judgment. Another recommendation he makes is juxtaposing unrelated ideas or concepts and letting their properties intermingle and produce new combinations (p. 230). Two of deBono's suggestions reversal and juxtaposition, are significant in regard to janusian and homospatial thinking processes.

The reversal technique appears to encourage janusian conceptualizations becasue it would move a thinker to consider opposite perspectives. One of deBono's examples illustrates how he perceives situations may be reversed.

> For instance if the situation is: "a policeman organizing traffic" then the following reversals might be made: The traffic organizes (controls) the policeman. The policeman disorganizes the traffic. (p. 142)

Such reversals would lead the thinker to new ways of thinking or new realizations.

> It would make one realize that in fact the traffic does actually control the policeman since his behavior depends on the traffic buildup in different roads.... The second reversal in the policeman situation supposed that the policeman was disorganizing the traffic. This would lead to a consideration of whether natural flow, traffic lights or a policeman was most efficient.... (pp. 143-144)

Implicit in deBono's example is that multiple oppositions are possible -- a characteristic of janusian thinking. What distinguishes deBono's presentation from a janusian conceptualization is that it is not clear that the opposition is actually perceived simultaneously rather than being a sequential recognition. If the policeman was both controlling and being controlled by the traffic or if he was both organizing and disorganizing the traffic at the same time this would constitute a janusian conceptualization. Whether the perception of opposites is sequential or simultaneous appear less critical a question for deBono than for Rothenberg.

The other technique most relevant to Rothenberg's work is the juxtaposition of unrelated ideas. Such juxtapositions and their subsequent intermingling or properties would certainly seem to encourage homospatial fusions of discrete entities. However, the actual fusions of discrete entities are not a part of deBono's suggested approach. Additionally, the suggested juxtapositions might encourage the formation of janusian conceptualizations, but the juxtaposition of antitheses of opposites is not an explicitly stated part of deBono's recommendation; this aspect differentiates it from janusian thinking.

deBono's work provides valuable suggestions to the person interested in developing new ways of thinking. Although his descriptions of lateral thinking appear to be at a more general level than those of Rothenberg's, two of his recommendations, "reversals"

and "juxtaposition of opposites" seem to encourage janusian and homospatial thinking.

Summary and Critique

The preceding section presents Rothenberg's theories of janusian and homospatial thinking and then compares and contrasts them with ten other theoretical viewpoints as they relate to creative thinking. The salient points made in the comparisons are outlined in Figure 2.1. Numerous similarities in the theories have been pointed out as well as some major differences. As a means of summary and critique the two most important similarities and the two most significant differences between the theories are discussed below.

A similar vein which runs through the accounts of many of the writers is the idea of bringing opposites together in a way in which antithetical or contradictory ideas, concepts, images, etc., operate concurrently. This idea is central to janusian thinking and is evident in the writings of Koestler, Maslow, Gordon and Prince, deBono, and Kelly. Additionally, Piaget appears to use this type of thinking in the construction of his theory, but does not explicitly describe it in the terms used above.

The second major similarity is that making combinations is an important part of the creative process and that separates may be integrated through various means. However, the words "fusion," "superimposition," and "overlaying" are used by Rothenberg, Koestler,

Figure. 2.1. Comparison between Rothenberg's Janusian and Homospatial Thinking and Ten Selected Theoretical Viewpoints.

Author and Name of Theory or Aspect of theory reviewed. (In order of Presentation)	Relationship to Janusian Thinking (separating/specifying function)	Relationship to Homospatial Thinking (combining function)
Rothenberg, Janusian and Homospatial Thinking Processes	Opposites or antitheses are juxtaposed, and perceived to be equally true and operative at the same time; time is transcended; a dimension is "encapsulated; a conscious process.	Discrete entities, sensations, etc. are fused or superimposed and perceived to occupy the same space; space is transcended; new combinations occur; a conscious process.
Koestler, Holons/Bisociation	"Janus effect" produces "whole-parts" or holons. Opposites are operative at same time. Occurs on all leves of awareness.	Bisociation--cognitive matrices (holons) are fused or juxtaposed make new connections. Occurs on all levels of awareness.
Kubie, Creative Preconscious	Unencumbered preconscious supplies ideas for free association.	In preconscious analogies and superimpositions are made condensing experiences through imagery and allegory into a single hieroglyph.
Kelly, Constructive Alternativism	Dichotomies are constructed as being relativistic, antitheses are simultaneously suggested in all constructs.	(No relationship perceived in work reviewed.)
Maslow, Self-Actualized Person	Opposites/contradictory elements are brought together so as not to be mutually exclusive; time is transcended.	Separates/opposites integrated into a unity; self is integrated with surroundings; space is transcended.
Belth, On Metaphor	(Aspect not addressed in work reviewed.)	Metaphor produced by laying one context of knowledge over another; perceived separate matters as one.

Figure 2.1. (continued)

Author and Name of Theory or Aspect of Theory Reviewed	Relationship to Janusian Thinking	Relationship to Homospatial Thinking
Perkins, Creativity as Selecting	No specific processes similar to janusian or homospatial thinking are presented. Creativity is characterized as a selecting process with four basic moves: (1) planning a means to an end; (2) "abstracting" new plan from work in progress; (3) "undoing" and "redoing" work as needed; and (4) "making means into ends."	
Piaget, Reflexive abstraction and Equilibration	Separated mental constructs are products of direct experience and previous abstraction in state of dynamic equilibrium—balance between assimilation and accommodation.	Through "reflexive abstraction" similarities are constructed causing a simultaneous restructuring and enlarging or mental constructs at a higher level of understanding.
Gordon and Prince, Synectics	Opposites and antitheses are brought together in "compressed conflicts," oxymorons to pro- duce creative effects.	In forming "personal analogies" people imagine becoming something else. Process of "force fitting" uses metaphoric analogy equations.
Guilford, Structure of the Intellect Model	Divergent production serves to specify pertinent information from the memory store. Trans- formations like "reversals" can help to separate information.	Transformation of information as in formation of puns results from substitution of meanings.
deBono, Lateral Thinking	Looking at situations in reversed manner is recommended as way of seeing new possibilities.	Forming analogies and making juxtapositions of unrelated ideas is seen as a means of making new connections.

Kubie, and Belth to describe similar processes of combining separate elements into wholes. Moreover, Maslow, Gordon and Prince, and Piaget use different terms yet seem to describe a similar sort of process. Although differences in the perspectives of these writers do exist, and have been pointed out earlier, a fusing, superimposition or overlaying of separate entities, contexts, matricies, frames of reference, etc., appears to be an important means by which creative combinations are made.

The two major differences between the various authors centers on (1) the level of awareness where the thought processes occur; and (2) the level of specificity the authors use in describing the thought processes. In regard to the first point Rothenberg places janusian and homospatial thinking under the aegis of conscious thought processes. Also, seeming to be in the same camp on this issue are Perkins and Piaget, who see creativity as a logical rational process. Notable exceptions to these authors are Koestler, Kubie, and Gordon and Prince who believe that creative combinations are very much, if not entirely (see Kubie), a preconscious activity.

The final difference between the authors is not in the actual content of the theories but in the levels of specificity that they use to describe the creative process. Rothenberg appears to go far beyond the other theorists and provides a far more detailed account of the psychodynamics underlying creative activity. For example in Koestler's bisociation different frames of reference (cognitive

matrices) are fused or juxtaposed. In his account of this he does not go the next step to explain how the mind actually perceives such a fusion or juxtaposition occurs. Rothenberg is more specific and gives detailed accounts of how the mind makes such combinations. Most of the other authors are far more general than Rothenberg in their accounts and in nearly every one of them, janusian and/or homospatial process could account for the processes which they describe.

Rothenberg's theory is not without its own problems however, its specificity raises problems of its own. Paradoxically, at the same time that it is more illuminating at the theoretical level, it is more difficult to prove and use at the practical level. To use Koestler's bisociation as an example again, the broader concept of either fused or juxtaposed matrices in bisociation, incorporates a wider range of possible human experience, and obviates the necessity of making often times relativistic distinctions between metaphor and analogy, thus making the broader process of bisociation a more useful concept on a practical level -- because it could be both or either, ambiguous situations may be easier to live with. Additionally, Rothenberg's belief that opposites are perceived simultaneously may be difficult if not impossible to ever prove. Whether this can actually occur is at least open to speculation. One final area where specificity in Rothenberg's theory makes precise distinctions in practical situations difficult is that in homospatial thinking he explains that fusions of whole entities occur and not partial similarities or partial fusions. Given that these are characterized as vague perceptions it seems at

least possible that these mergers of entities might actually occur in various proportions. For example, there might be a 75% merger of two entities, or a 50% merger of two entities; would either or both of these constitute a homospatial image, what percentage would? In spite of these questions raised by the specificity with which Rothenberg has ventured to describe the creative process, his theory appears to cover new ground, and provides an exciting springboard for additional research.

Section II

Creative Teaching and Teachers' Thought Processes

The second area of literature relevant to this study concerns the creative thinking of teachers as they both plan and actively teach. This section opens with a discussion of creative teaching and some variables which affect it. This is followed by a presentation of research findings about teachers' thought processes.

Creative Teaching

Teachers must reconcile two apparently opposing sets of societal demands. On the one hand, they are expected to be creative and to encourage the creative abilities of their students. On the other hand, they are expected to convey facts that society has deemed

important and to develop in every student various skills in areas such as reading, writing and mathematics. Eisley (1962) states:

> The teacher must ever walk warily between the necessity of inducing those conformities which in every generation reaffirm our rebellious humanity, yet he must at the same time allow for the free play of the creative spirit. (p. 24)

He believes that society is never totally sure which it wants, the inculcation of facts or the promotion of new learning which would enhance each individual's chances of success in the future (p. 38). While these are not necessarily irreconcilable positions, they can be and are frequently viewed as such. The meaning of being a creative teacher and some of the problems which are encountered in being creative are discussed below.

Defining Creative Teaching

"Creative teaching" refers to the actions of teachers which results in new and valuable instructional products or effects, such as: plans for learning activities, learning environments, instructional strategies, instructional performances (teaching behavior), interactions with students, and/or plans for addressing an instructional concern, need or problem.

It has already been explained that the qualities of newness and value are aspects of creativity of which the teacher him or herself is the best judge. The notion of what constitutes a product requires further elaboration in that products are not always tangible nor are results immediately evident. Ultimately the product of teaching is

pupil learning. This alone, however, is not a suitable measure of teacher creativity in every case. Pupil learning may simply be the result of good teaching or the outcome of a pupil's individual efforts and motivation, and have no relationship to any creative behavior on the teacher's part. Pupil learning is also an unreliable indicator of teacher creativity since measurement of learning in all of its manifestations is difficult. How, for example, does one determine whether a student becomes a better citizen after a particular lesson? Does a student "know" division if seven out of ten problems can be solved correctly? Moreover, it is known from Piaget's work that learning is not a regular sequential progression. There are irregularities, periods of time when the student appears not to be progressing at all. Because of these and other problems it is inadequate to use student learning as a sole or necessary criterion for assessing teacher creativity. Student learning is, however, a potentially useful means of determining when the teacher activity has been successful. These issues underscore the importance of obtaining a teacher's subjective assessment of the perceived value of a particular activity. Where possible this should be supported by evidence of student learning, behavior change or some positive effect.

Generally speaking, the range of products seen as useful in helping to determine when creative behavior has occurred is limited to the teacher's plans -- both written and stated, the teacher's actions in preparing and implementing learning activities, and, whenever possible, any evidence of positive effects on student learning or

behavior. These teaching products may include the creation of questions or problems for students to address, a series of learning encounters, or a metaphor or analogy which clarifies an instructional point.

The Need for Creative Teaching

Futurists, as well as general critics are calling for renovation of our schools to make them more relevant to the needs of students and society and to make them less boring (Jimenez, 1975; Lytton, 1971; Toffler, 1974; Torrance, 1980). Torrance, for example says, "The predictions of futurists dramatize the need for increasingly more creativity for living and adapting to the demands of a high-change world." He explains, "Today's children will live as adults in a world vastly different from today's world. They will do kinds of work that do not now exist. This will require abilities, skills, attitudes, and information that we cannot imagine today" (p. 298).

There have been two major approaches to making schools more relevant. One approach, according to Lytton (1971), has been to deliberately infuse the curriculum with experiences that foster student creativity and problem solving (p. 98). deBono's (1970), Lateral Thinking; Feldhusen's (1977), Teaching Creative Thinking and Problem Solving; Samples (1977), The Wholeschool Book, and Shallcross' (1981), Teaching Creative Behavior are books which provide teachers with techniques and approaches to foster creative abilities. The second approach which Lytton describes is:

> ...to generate a "creative spirit" in the school and to
> adopt an experimental, creative open-ended approach to
> learning in each individual field of the ordinary
> curriculum. Such an environment would require new ways
> of approaching traditional subjects and an attitude on
> the part of the teachers to adopt the approaches. (p. 98)

Clearly, both of these approaches overlap and in both teachers are of
central importance.

For Jimenez (1975), the burden of making the schools more
effective rests with the teacher:

> ...the problem is not mainly with the materials.
> Therefore, the solution is not mainly with the
> materials. The problems and the solution are both
> mainly in the teacher, who needs to be thoroughly
> familiar with his subject, but needs also for his sake,
> to keep seeing it in strange and personally intriguing
> ways. Therefore, the teacher's hidden second task is to
> put himself into a state of tension between the familiar
> and the strange. He has to do for himself what he seeks
> to do for his students. (p. 34)

In summary, the need for creative teaching is to provide students with
the tools to become creative problem solvers in a future which cannot
be entirely predicted. Teaching creatively ensures that new ideas and
approaches will be incorporated into the curriculum and that the
teacher's own creative spirit can serve as a model to the students.

The Creative Influence of Open Education

A strong positive influence on creativity in teaching has been
the open education movement as described by Bussis and Chittenden
(1970, 1972) and Nyquist and Hawes (1972). Open-education is in many
ways an extension and revivification of Dewey's progressive school
movement, emphasizing the roles of teachers and students as curriculum
decision makers.

Not all of the aspects of the open education approach to education can be addressed here, but there are two aspects which appear to have much to do with encouraging teacher creativity as well as student creativity. First, teachers and students concurrently have a high degree of curriculum decision-making power; and, secondly, teachers are seen as more than dispensers of knowledge -- they are active learners.

Regarding the first aspect, teachers and students in an open education setting are both seen as having high degrees of influence in the curriculum decision-making process (Bussis & Chittenden, 1970, pp. 20-27; 1972, pp. 119-220). The open-education classroom is simultaneously "adult-centered" and "child-centered," that is, it reflects both teacher needs and concerns as well as those of the children. In this regard it has both janusian and homospatial qualities. "Director" and "directee" are opposing elements which operate simultaneously within teachers and students in a janusian fashion. And in what could be a concurrently operating perception of teacher and student occupying the same space -- both dynamically fused, simultaneously performing as learner/teacher, or director/directee. In the good open education classroom an optimum balance or equilibrium is reached in the making of decisions where teacher and learner both influence and are influenced by one another.

A common perception has traditionally been to see teacher decision making and student decision making as separate and opposing activities -- one is frequently seen as precluding the other. The

insight of Bussis et al., that these activities are not necessarily opposing processes, but rather that they can be equally operative and true is a liberating conception. It suggests that both teacher and students can be engaged in activities which are perceived as important and personally meaningful.

The important aspect of this for fostering creativity is that in the open education movement the recognition of teachers and pupils as important contributors to the curriculum decision-making process encourages teachers to take steps to liberate themselves and their students from blindly following externally prescribed curricula. An attitude emerges in these settings that teachers and students can be responsible curriculum decision makers and that this perrogative should be exercised and supported by school principals and others in authority.

The second aspect of the open education movement which has helped to foster teacher creativity is the idea that teachers do more than give out knowledge. They themselves are learners and help to facilitate their own learning and the learning of the students. When teachers take on the attitude that they need not have all the right answers, they give up the burden of having to always be right or be the authority. By recognizing that a person cannot know everything, the person, or teacher in this case can be free to openly ask questions about things they find puzzling. As Jimenez was quoted as saying earlier, the creative teacher sees things in new and personally meaningful ways. Open education encourages teachers to adopt this kind of attitude.

Blocks to Creative Teaching

It has been suggested above that in attempting to foster creativity, teachers can be their own biggest stumbling blocks in this effort. As Combs (1979) points out in his discussion of problems encountered in changing education:

> Whatever changes occur must come from the teachers themselves. In the final analysis, it is they who control what goes on with the students. Unless teachers change, there will be no change, as many a frustrated administrator or supervisor can attest to from sad experience. (p. 210)

The school environment also presents some very real deterrents to teacher creativity and school administrators themselves are frequently singled out as another culprit. Hahn's (1973) book, Creative Teachers: Who Needs Them?, illustrates how school principals can undermine the efforts of teachers to be innovative. Another example of how administrative red tape can stifle teacher creativity is presented by Kyle (1980). She documents how school rules, promotion policies, lesson plan requirements and highly structured schedules adversely affect teachers' creative spirits (p. 77-85).

One of the strongest criticisms of the school environment and the stifling effects it has on school change and creative behavior comes from Sarason (1971). He claims that the school's culture with all of its "existing regularities" blocks the vision of the individuals working within the system. Fixed time schedules, promotion policies, entry policies, evaluation procedures, subject matter divisions, and many more existing practices become routinized and block teachers' and administrators' ability to view schools and

schooling in different and more adaptive ways. Sarason believes that

it is important for teachers, principals, and others working to

improve schools, to recognize, as objectively as possible the school's

existing culture, recognize it as an adversary to needed change.

After having done so, it is important to examine these patterns,

question them, and explore alternative ways of functioning.

Of prime importance here are the regularities found between

teachers and children:

> It is probably true that the most important attempts to
> introduce change into the school culture <u>require</u>
> changing existing teacher-child regularities. When one
> examines the natural history of the change process its
> failure to bring about needed change it is precisely
> these regularities that remain untouched. (pp. 86-87)

One may infer from Sarason's comments that failure to recognize and

understand the existing patterns found in school environments leads to

the repression of creative behavior by those working in the system.

The particular patterns and existing regularities which must be

understood to facilitate change and creativity are those patterns

between teachers and children.

Variables outside the immediate school environment can also have

an impact on teacher creativity. An Organization for Economic

Cooperation and Development (OECD) report (1978) states that,

"'Creativity' and educational innovation become precarious values

within the context of restricted budgets and increasing demands for

accountability" (p. 7). The effects of Proposition $2\frac{1}{2}$ in

Massachusetts and other tax cutting measures in other states has

certainly had a depressing effect on the morale of school personnel in recent years. Restricted budgets has meant "extracurricular activities" such as art, music, gifted and talented programs have had to be cut back or dropped. Paradoxically, however, such external influences have the potential of encouraging more creativity. Restricted budgets call for new ways of doing things, finding more efficient ways of doing things. New problems encourage people to engage in searches for solutions and these solutions frequently require creative thinking.

In summary, there are numerous variables which can block creative teaching. These range from external budgetary constraints to the individual teacher's limited view of what is possible. Teachers are seen in this study as the most central figures in ensuring that the curriculum meets student needs and helps students develop creative abilities. Teachers need to be engaged in what Unruh (1975) terms "responsive curriculum development."

> Responsive curriculum development implies the ability to meet diverse human needs, to receive new ideas, and to adapt to new situations, new knowledge, and new uses of knowledge. It is a process of continuing renewal of the curriculum through which new forms are created to fit new conditions in the environment. (pp. 89-90)

Such a view of curriculum development requires that the teacher be more than a passive transmitter of information. This view of curriculum development requires teachers capable or flexible and creative thought. The next section, describes some of the recent research effort which have aimed to explain how teachers actually go

about the creative planning and implementation of curriculum which is responsive to new and changing situations.

Research About Teacher Creativity and Thought Processes

The research on teacher creativity has focused predominately on efforts to teach creativity and on the attributes of creative teachers; little attention has focused on the creative thought processes of teachers. The research has relied heavily on the use of quesitonnaires and tests such as the Torrance Test of Creative Thinking (TTCT), c.f., Johnson (1974), Whitaker (1975), McCord (1976), Sostrom (1976), and Rosenberger (1978). The results of some of these studies suggest that certain creative behaviors can be taught (Rosenberger, 1978; Ball, 1974), while others suggest that teachers who are caring and utilize active teaching methods (Sostrom, 1976) and are flexible (Barry, 1974) are regarded as more effective and creative. However, the results of these studies do little to explain the dynamics of teachers' creative thinking.

A more relevant and fruitful body of research for the purpose of this study centers on investigation of teachers' thought processes in the planning and implementation of curriculum. While the investigators in this area have not generally approached the topic with teacher creativity as their focus, their work has a great deal to do with the topic. Reviews of the literature in the area of teachers' thinking are provided by Clark and Yinger (1977), and Shavelson and

Stern (1981). These reviews indicate that research about teachers' thought processes is a relatively new area of investigation. Clark and Yinger (1977) point out the reason for the current interest:

> A relatively new approach to the study of teaching assumes that what teachers do is affected by what they think. This cognitive information processing approach is concerned with teacher judgment, decision making, and planning. The study of the thinking processes of teachers -- how teachers gather, organize, interpret, and evaluate information -- is expected to lead to understanding of the uniquely human processes that guide and determine teacher behavior.... Teacher behavior that is sensible and effective in one setting may be inappropriate in a second setting, and it is the individual teacher who makes decisions about appropriateness and defines the teaching situation. So, if research is to be put into practice -- if the general case is to be applied in particular situations -- then we must know more about how teachers exercise judgments, make decisions, define appropriateness, and express their thoughts in their actions. (pp. 279-280)

The research about teachers' thinking has had various foci. These have included: studies of teacher planning, teachers' judgments, teachers' interactive decison making, teachers' implicit theories, and cognitive processes. Relevant findings from these areas of research will be presented here under the following three headings: teacher planning, interactive decision making, and teachers' implicit theories.

Research on Teachers' Planning

MacDonald (1965), Eisner (1967), and others have suggested that the traditional, sequential, objectives-first model described by Tyler (1950) and Popham and Baker (1970) does not reflect educational

realities. Subsequently, Zahorik (1975), Yinger (1977), and

McCutcheon (1980), have supported this view with research findings.

Shavelson and Stern (1981) indicate that the basic instructional

planning element used by teachers is the "instructional activity."

They suggest a reason why instructional planning does not follow the

prescriptive sequential model:

> Obviously there is a mismatch between the demands of
> classroom instruction and the prescriptive planning
> model. This mismatch arises because teachers must
> maintain the flow of activity during a lesson or face
> behavioral management problems. Hence, they are faced
> first and foremost with deciding what activities will
> engage students during the lesson or, put another way,
> the teacher must decide how to entertain his or her
> audience while attending to the curriculum. Activities,
> then and not the prescriptive model are the focus of
> teacher planning. (p. 477)

They added that teacher planning is made up from six elements:

content, materials, activity, general goals, student abilities, needs

and interests, and the social context of instruction. They said:

> The conception of teacher planning, then, is one in
> which instructional tasks are created by the teacher....
> Unfortunately the sequence of elements considered and
> the compromises that have to be made are yet unknown.
> They probably depend on the particular task at hand as
> well as the proclivities of the particular teacher. (p. 478)

Yinger (1977) lists seven features of planning that the teacher

in his study exhibited: location, structure and sequence, duration,

participants, acceptable behavior, instructional moves or routines and

content and materials. The process of planning which he observed was

a matter of selecting, organizing, and sequencing routines as a result

of experience. The routines are a means by which teachers reduce the

complexity of classroom settings and make them more predictable (Clark & Yinger, 1977, p. 284).

A model for planning presented in the Yinger study suggests that there are three basic stages of curriculum planning. First, there is a problem-finding stage. He describes this as a discovery stage in which: "...the teacher's goal conceptions, her knowledge and experience, her notion of the planning dilemma, and the materials available for planning interact to produce an initial problem conception worthy of further exploration" (Clark & Yinger, 1977, p. 285). The second stage of the process is seen as a design cycle in which a process or mechanism is developed for meeting the need identified in the first stage. The plan may be elaborated or adapted in various ways in this stage. In the final stage, the planning model involves implementation of the plan, evaluation, and possible routinization. This final stage is seen as playing as important role in forming a knowledge base for future planning (p. 285).

Zahorik (1970), in an empirical study of classroom teaching, compared teachers who had planned in advance a given lesson with teachers who had been given the same topic to teach just prior to the actual time of instruction with essentially no time to plan. Analyzing the teacher protocols for sensitivity to student responses such as encouraging pupils' ideas and thoughts, Zahorik found that the teachers in the planning group exhibited less honest use of pupils' ideas. He arrived at the conclusion that using the normal planning

model resulted in having teachers be less sensitive to the pupils'
needs and ideas.

McCutcheon (1980) and Kyle (1980) report findings consistent
with those of Zahorik and others, that objectives are frequently not
the starting focus for teachers' planning of instruction. McCutcheon
reports on the findings of a team of four researchers who interviewed
teachers about their curriculum planning, and observed teachers at
work in their classrooms. They found that one of the richest forms of
planning was the "mental planning" of teachers:

> Perhaps the richest form of teachers' planning that we
> studied was the complex mental dialogue, the reflective
> thinking, that many engaged in before writing these
> plans or teaching a lesson. Sometimes the result of
> mental planning was sketchily outlined in planbooks, but
> much of it never appeared on paper. Part of the mental
> dialogue resembled a rehearsal of the lesson, and
> envisioning of what had happened previously during the
> year or what had happened in other years when a similar
> lesson was taught. (pp. 7-8)

McCutcheon further reports that teachers frequently did this mental
planning at odd times of the day: watching television, driving home
from work, and in the shower. She notes that the focus of these
"mental dialogues" is on the practical problems of getting ready for a
day of teaching rather than on theoretical issues of instruction:

> Despite this potential of mental planning, few teachers
> appeared to try to relate theory or research findings to
> practice. Rather teachers usually considered practical
> problems associated with getting through the day --
> maintaining order, wondering whether a lesson would fit
> into the time allocated for the subject and whether
> materials were available. (p. 9)

Other teachers were reported to have indicated that mental planning
helped them to make the lessons more "robust," help the lesson run

more smoothly, and that mental planning helped the teacher to enter a lesson more confidently (p. 9).

Textbooks were seen in the study as providing teachers with a means for establishing a general scope and sequence of content to be covered, but that this varied with particular content area -- math and reading being less flexible, whereas, science and social studies offered more freedom of choice for the teacher. Administrative policies were another guiding force in the curriculum. Many teachers decisions were influenced by school curriculum policies as dictated by the school principals.

McCutcheon summarizes her findings as follows:

> One important activity of planning, then, is mental planning, reflecting on the past and envisioning what might occur in current and subsequent lessons. Mental planning occurs frequently and at odd moments during the day. This sort of planning has not been legitimated in education courses, in research, or in theory. It is free-flowing; ideas occur and are related almost simultaneously. (p. 11)

Later she adds:

> Teachers' learning...involves a complex, simultaneous juggling of much information about children, subject matter, school practices, and policies. Teachers' planning does not follow the objectives-first model taught in many education courses and...favored by principals. Rather teachers' planning takes into account far more information and follows different paths of thinking and a different order. (p. 20)

The results of this particular study validates the need for further study in this area in that much of the "mental planning" which the study describes as occurring is not explained as to how the images actually occur to the teachers and what the nature of the images

actually are. McCutcheon's study points up the need to recognize these mental plans of teachers as legitimate content for investigation by researchers and for reflection by teachers.

Research on Interactive Teaching

The research in this area seeks to understand teachers' thoughts as they implement learning activities (MacKay & Marland, 1978). McNair (1978-79) refers to these decisions as "inflight decisions." This research, according to Shavelson and Stern (1981), consistently shows that teachers' plans serve as a mental script or image.

> The images or scripts are routinized. Once begun, they
> typically are carried out. Hence interactive teaching
> has been described in many studies as primarily carrying
> out a routine.... Moreover, this research has found that
> teachers are reluctant to change their routines, even if
> they are not proceeding as well as expected. When
> changes do occur, they typically are minor adjustments
> in the routine and not major revisions.... (p. 482)

Shavelson and Stern suggest that teachers' reluctance to change routines is due to the lack of alternative routines. Because hastily developed routines may increase uncertainty for teachers and pupils, such changes pose threats to the teacher.

Despite the reluctance of teachers to alter their routines, there is evidence to suggest that some decision making and planning does occur during the implementation of a lesson. MacKay and Marland (1978) describe their findings:

> ...usually fewer than 10 decisions per lesson were
> reported (range for the six teachers, 3 to 11; mean:
> 6.8). Further analysis of the interactive decision of
> teachers participanting in the Alberta study revealed

that the number of alternatives considered per decision
rarely exceeded two and that, in making their choices of
alternatives, teachers considered only two or three
factors....

A phenomenon which occurred with much greater frequency
in the protocols of all six teachers was the deliberate
act (average number of deliberate acts: 21.5 per
lesson). Twenty to thirty times in each lesson, five of
the six teachers reported planning a tactic to be used
in the lesson but without considering more than one or
two factors at least.

Taken together, the number of points at which decisions
and deliberate acts were planned suggests that there
were usually at least 30 or more potential decision
points in a lesson. (p. 11)

A question which the researchers view as intriguing is why the

instructional planning appeared to be of such limited rationality,

i.e., why so few alternatives were considered, and why so few

decisions were made during periods of intense lesson activity. The

researchers suspect that this may have occurred for several reasons:

(1) in keeping up with the pace of a fast moving lesson teachers may

have only been able to react to events in keeping up with them; (2)

teachers may have lacked "familiarity with the use of the decision

making metaphor to describe their cognitive behavior during

instruction" (p. 12); (3) teachers' reports may not have been

accurate representations of their covert mental activity; and (4)

interview techniques may have missed opportunities to identify

decisions. The researchers conclude:

No categorical proof can be given that decision making
of teachers in the sample was, or was not, of limited
rationality, but the weight of available evidence is on
the side of limited rationality. No evidence could be
found, for example, that teachers ever considered the
propriety of the alternatives they generated.
Alternatives seemed to "pop up" spontaneously, as if
ready made. Teachers then gave reasons for choosing one

>or the other, but did not think about the desirability
>of the proposed alternatives vis-a-vis other
>alternatives. (p. 13)

Although they prompted the teachers to describe their thinking, MacKay and Marland do not indicate that they focused on the alternatives that "seemed to pop up spontaneously." As with most of the studies in this area, investigators have not explored the underlying mental processes of the spontaneous generation of alternatives especially the nature of teachers' images.

One final point about "in flight" decision making is that it is most likely to occur when students signal a lack of interest in an activity and/or begin to disrupt the activity with unsanctioned behavior. MacKay and Marland (1978) indicate that teachers make periodic checks to see if a lesson is going as planned; but the bulk of interactive decision making occurs when disruptions jeopardize the successful implementation of the lesson (p. 27) (c.f., Joyce, 1978-79; McNair, 1978-79).

Implicit Theories of Teachers

Implicit theories of teachers refers to the perspectives and beliefs of teachers which influence their decision making and classroom behavior. How beliefs are held and how they affect teachers' ability or willingness to change or make changes in curriculum are seen as two relevant aspects to understanding teachers creativity. The results of three studies: Bussis et al., Janesick, and Elbaz, are discussed below.

Bussis, Chittenden and Amarel (1976) studied teachers' beliefs about open education to find out: (1) how teachers perceive their decisions about curriculum and resources; and (2) what teachers perceive about the support they receive in the working environment. The researchers tape-recorded interviews with sixty teachers from open education settings to gather their data. Their major findings relevant to this study are:

1. Teachers vary considerably in the number and nature of their priorities related to teaching, and they also vary in the degree to which they are consciously aware of having priorities at all;

2. There are vast differences in the number and strength of connections that teachers perceive between their organizing principles (deep curriculum) and overt classroom practices (surface curriculum);

    Four subgroups of teachers were identified in relation to the teachers' dominant curriculum priorities and the degree to which they were experimenting with surface curriculum.

    Group 1. "Grade-level facts and skills" is clearly the dominant
    (12%)   priority, and there is little evidence of experimenta-
             tion or change in the surface curriculum from what the
             teachers had been practicing previously.

    Group 2. "Grade-level facts and skills" is clearly the dominant
    (22%)   priority, but there is much evidence of change and
             experimentation with the surface curriculum.

    Group 3. "Grade-level facts and skills" is an expressed
    (39%)   priority, but not a dominant priority. Middle-range
             priorities tend to be dominant and there is evidence
             of a potentially rich surface curriculum.

    Group 4. A comprehensive or middle range priority is dominant,
    (27%)   and there is little evidence of preoccupation with
             grade-level facts and skills -- i.e., it is not
             codable as such. There is also evidence of a
             potentially rich surface curriculum. (pp. 164-165)

Additionally, Bussis et al., conclude that external advisors usually plays an important role during the initial years of implementation of an open education program (p. 168). And finally, the interview methodology used in the study is seen as a sensitive approach to the study of the underlying constructs about teaching and learning that have visible counterparts in the classroom (p. 171).

The Bussis, Chittenden, and Amarel study has several implications for this study on teacher creativity. First, it suggests that teachers vary significantly in their willingness to experiment with new curriculum ideas. Secondly, it suggests that teachers' beliefs affect their behavior and that the connection between beliefs and behaviors is complicated by the variety and strength of these connections. Thirdly, it suggests that teachers frequently are unaware of the beliefs which guide their behavior. These last two findings suggest that teachers' ability and willingness to be innovative in their instructional planning is a function of complicated and multifaceted mental processes many of which are not readily available to the teachers' conscious awareness.

Clark and Yinger (1977) report on a study by Janesick (1977) who investigated and described the instructional planning perspectives of one teacher:

> According to Janesick, a perspective is a reflective, socially derived interpretation of that which the teacher encounters that then serves as a basis for the actions he or she constructs. It is a combination of beliefs and behavior continually modified by social

> interaction. It enables the teacher to make sense of
> his or her world, interpret it, and act rationally
> within it. (p. 295)

For the teacher in the Janesick study, his perspective was characterized by concern for establishing a cohesive group atmosphere. The teacher actively fostered an attitude of "groupness" and saw himself as the group leader, modeling and emphasizing cooperation and respect within the group. This study lends support for the view that teachers' behavior is guided by underlying organizing principles or constructs. In this regard, Janesick's perspective seems consistent with Kelly's concept of "constructive alternativism" which was presented earlier. It is also noteworthy that the teacher in this study was <u>consciously</u> aware of his intentions to develop a cohesive group atmosphere.

In another in-depth study involving one secondary school teacher, Elbaz (1981) sought to determine how a teacher held and used "practical knowledge." Elbaz believes that teachers possess a frequently unrecognized body of knowledge that encompasses "knowledge <u>of</u> practice as well as knowledge <u>by</u> practice" (p. 46). The content of practical knowledge is perceived to fall into five categories: knowledge of subject matter, curriculum, instruction, self, and the milieu of schooling. She also identifies five orientations from which practical knowledge can be examined: situational, theoretical, personal, social and experimental.

Elbaz explains that "situational" orientations are aimed at making sense out of various teaching encounters. In instances when "theoretical" orientations dominated, the teacher in the study generalized theories and conditioned their use. "Personal" orientations refer to efforts to direct experiences in personally meaningful ways. "Social" orientation acknowledges that the teacher's behavior was conditioned and constrained by social settings of teaching. The final orientation, "experiential," relates knowledge to experience.

Elbaz describes three means by which the teacher in her study structured her personal knowledge and put it into actual practice. First, "rules of practice" are highly specific and brief statements of what to do in a particular situation. Second, is "practical principle" which is a broad statement of principle, or rationale for a particular approach. Finally, "images" are perceived to be "the least explicit and most inclusive..." (p. 61) means of structuring knowledge to be put into practice:

> On this level, the teacher's feelings, values, needs, and beliefs combine as she formulates brief metaphoric statements of how teaching should be and marshals experience, theoretical knowledge, and school folklore to give substance to these images. Images serve to guide the teacher's thinking and to organize knowledge in the relevant area. The image is generally imbued with a judgment of value and constitutes a guide to the intuitive realization of the teacher's purposes. (p. 61)

The level of "images" is of most interest here as it constitutes a mechanism for forming new patterns, as opposed to application of

routinized practices which is much the case with "rules of practice" and "practice principle." Elbaz reports that images were a powerful means by which the teacher could apply knowledge to new settings as she indicates in the following example.

> For Sarah, I found that the level of image was most powerful in organizing her knowledge and in bringing it to bear on practice. She appeared to make use of her knowledge in an intuitive manner, using images to order her thinking and extend her knowledge. This analytic finding was corroborated by Sarah's own account of her work. When she encountered a new idea (through reading or course work), she tended to set it on the back burner; later she would find that the idea was "working itself out" in practice. Because of the primacy in Sarah's knowledge, I found that the specific images she used provided a focal point and a means of summarizing her practical knowledge. (p. 62)

This description suggests that the use of imagery is very important in helping teachers to give substance to their beliefs, attitudes and values in a way that encourages the production of new ideas. Additionally, it is interesting to note that Elbaz describes Sarah's work to include evidence of metaphor production, opposition, and conflict.

In the study Sarah's need to communicate more clearly with her students was described in metaphoric terms; "...she wanted 'to have a window onto the kids and what they're thinking,' and, in turn, she wanted her own window to be more open" (p. 62). Although it is difficult to tell from this account, if the teacher conceived of having open "windows" in both directions simultaneously, then this would suggest the possibility of a janusian conceptualization. In

addition, seeing windows superimposed on her students would suggest the presence of homospatial thinking.

Elbaz's study is filled with description of how the teacher used conflict and tension together with her imagery. A few examples follow:

> Sarah's imagery, however, reflects a crucial insight that was beginning to emerge in her practical knowledge. In part, this was the realization that it is difficult to teach learning skills apart from specific content; but more important, Sarah was beginning to appreciate the necessity of a tension between form and substance, process and content, in the subject matter of instruction. (p. 63)

> The sense of tension that was beginning to emerge in Sarah's subject matter imagery was already well developed in her images of instruction. Sarah characterized her teaching style in terms of an opposition between spontaneity and distance, or control, and her interaction with students in terms of giving versus challenging them. (p. 63)

> My impression was that Sarah actively sought situations involving pressure and that she purposefully construed issues in terms of dichotomies.... Her cognitive style, with respect to instruction, was one in which she deliberately constructed a view of teaching situations which challenged her, which could shake up her existing mode of operating and bring about change and growth. Thus, the tension was, at least in part, a creative tension. (p. 64)

> Most of Sarah's practical principles are in the area of instruction, but she frequently works at the level of image even here. For example, she moved toward a desired style of interacting with students by reflecting on the notion of "giving too much, challenging too little," and trying out various approaches in an intuitive way. (p. 65)

In one final quotation Elbaz points out that imagery in discussion often goes unnoticed.

> Sarah's description of her social milieu is characterized by an imagery of conflict, competition, and aggression. The imagery slips by unnoticed at first, but once attention is drawn to it, the nature of this imagery becomes compelling. (p. 65)

The quotations given above suggest, by the amount of imagery and opposition present in Sarah's planning, that these are powerful tools in planning curriculum. Elbaz sees Sarah as an artist creatively composing curriculum from a base of practical knowledge. One of the major findings of the study was the recognition of the importance of using imagery along with a creative tension of opposing viewpoints as a means of structuring personal knowledge and applying it in instructional settings. Some of the examples are suggestive of janusian and homospatial thinking, although there is too little evidence to draw firm conclusions, yet the presence of imagery and opposition suggests that this is an area for further research.

Summary

This section characterizes creative teaching as a means of making education more interesting and relevant to the needs of learners. Creative teaching requires that learning experiences have both new and useful products or effects. These include both tangible lesson plans, instructional units, teaching materials, or less tangible, interactions with students, and images of approaches to use with students. An important factor in fostering teacher creativity is

seen as the teachers' own view of what is possible. Other variables affecting creativity in teaching are school schedules and other "existing regularities," promotion policies, support of the school principal, dominant educational philosophy in schools, budgetary restrictions, and other external forces from the community, state or federal levels.

The research having most relevance to this investigation is the research on teachers' thought processes. Studies of teachers' planning show that the traditional systematic models of planning do not refelct classroom realities. Rather, the "instructional activity" is the major focus of teachers' planning efforts. Various studies indicate that planning is complex and many variables are considered in the process, such as: location, duration, participants, content, materials, goals, structure and sequence, and instructional moves or routines. "Mental planning" is reported as being very common among teachers and as occurring at odd times of the day and night: much of which is never entered into plan books. Through these mental plans teachers rehearse and work out approaches to practical classroom problems. It is also noted that textbooks are still seen as useful tools to help teachers plan, especially in areas like math and reading.

Research on "interactive teaching" indicates that inflight decision are often limited to times when the attention of the class is being lost or when behavior problems disrupt the flow of an activity. Even when problems do occur plans are often not altered; it is believed that this tendency is due to the teachers' perceptions that

changing a plan or routine, once started, would produce even greater uncertainty for the teacher and children. Whether the limited number of decisions and variables teachers consider in making inflight decisions is due to efforts of the teachers to simplify complex situations, the inability of teachers to keep up with the fast pace of instruction, or to the inadequacy of research methods to observe and identify this type of decision making is an area for further research.

The findings about implicit theories of teachers suggests that teachers' decision making is based upon a complex constellation of beliefs on different levels of conscious awareness, and of varying levels of strength. Teachers are observed to vary significantly in their ability and willingness to experiment with new approaches and new lesson content, and this is due to their beliefs and their ability to examine and modify them. Finally, the Elbaz study illustrates that imagery and perception of contrasting elements can be important elements in creative teaching behavior.

The methods of investigating teachers' thought processes are presented and discussed in the following chapter. A detailed description of the methodology employed in this study is also explained.

CHAPTER III

DESIGN OF THE STUDY

The study had two purposes. The first was to develop and describe a methodology for observing and documenting evidence of janusian and homospatial thinking exhibited by elementary school teachers in planning and implementing novel learning activities. The second was to observe and describe evidence of these thought processes in a selected group of teachers. Several qualitative methodologies were employed to gather the information. A combination of classroom observations, interviews, journal keeping, and researcher field notes were the data gathering tools employed. This chapter presents a description of the data collection procedures and an overview of how the data were analyzed. The chapter has been divided into five subsections: (1) Theoretical Background for a Qualitative Approach; (2) Background Information About the Research Setting; (3) Collection of Data; (4) Analysis of the data; and (5) Trustworthiness of the findings. In the first section the rationale for use of a qualitative approach in this study is presented and the theoretical background for the approach is discussed.

Theoretical Background for a
Qualitative Approach

The need for developing and refining a methodology to capture the creative thought processes of teachers was expressed in Chapter I. This section explores in greater depth the appropriateness and the perceived utility of the qualitative methods employed in the study. The decision to use qualitative methods stemmed from the perception that these techniques would generate descriptive information about creativity -- an area still not well understood. Secondly, qualitative methods were seen as the most useful means of capturing the complex realities of teachers' thinking as they planned and implemented new learning activitites. A rationale for these perceptions and the theoretical underpinings of the methods employed in the study are described below.

Statistical, quantitative studies were seen as particularly inappropriate due to the lack of "hard data" about the nature of teachers' creative thought processes and about the presence or absence of janusian and homospatial thinking. Lofland (1971) emphasizes the importance of knowing something of the quality of peoples' behavior before trying to quantify it:

> The bedrock of human understanding is face to face contact. Statistical sociology serves to amplify and to check on the representativeness, frequency, and correlation of the knowing that is founded on that bedrock. Quantitative studies serve primarily to firm up and modify knowledge first gained in a fundamentally qualitative fashion. (p. 6)

Patton's (1980) remarks are more specific to the purpose of this study. He believes that qualitative methodologies are best suited in areas where precise measurements are not yet the "state of the art":

> Creativity is a prime example. While there are some instruments that purport to measure creativity, the applicability of those instruments in diverse situations is at least open to question. Thus a program that was attempting to make students or clients more creative might do better to document in detail the activities, behaviors, thoughts and feelings of participants rather than to administer some instrument. (p. 75)

Precise measurement of creativity is not the state of the art, and therefore, use of qualitative tools are important for investigation in this area. Prominent theorists and researchers in creative thinking who have used qualitative methodologies are Koestler (1964), Rothenberg (1979a) and Perkins (1981). In building his theory of the "act of creation," Koestler relied heavily on analysis of accounts of peoples' creative behavior. Both Rothenberg and Perkins used the accounts of creative individuals' thinking to analyze mental processes and form their theories of creative thinking. Both researchers also used interviews with people engaged in creative activities to gather data for their research. Additionally, it is worth noting that both Freud (see Freud, 1964) and Piaget built their theories about human behavior and intellectual development from data that was largely acquired through the use of qualitative methods.

Rist (1977) explains that the orientation of the qualitative approach assumes that an understanding of a situation can best be

achieved by having the researcher take the perspective of the participants:

> Emphasis is placed upon the ability of the researcher to "take the role of the other," to grasp the basic underlying assumptions of behavior through understanding the "definition of the situation" from the view of the participants, and upon the need to understand the perceptions and values given to symbols as they are manipulated by man. Qualitative research is predicated upon the assumption that this method of "inner understanding" enables the comprehension of human behavior in greater depth than is possible from the study of surface behavior, the focus of quantitative methodologies. (p. 44)

One of the ways that the researcher can get a better perspective of a situation is to enter the natural setting of the research subjects. Wilson (1977) points out that social scientists "believe that it is essential to study psychological events in natural settings, and they claim that settings generate regularities in behavior that often transcend differences among individuals" (p. 247). This perspective is also emphasized by Bogdan and Biklen (1982) who state:

> Qualitative researchers go to the particular setting under study because they are concerned with context. They feel that action can best be understood when it is observed in the setting in which it occurs.... To divorce the act, word, or gesture from its context is, for the qualitative researcher, to lose sight of significance. (p. 27)

Another important aspect of qualitative research is the descriptive nature of the data. Bogdan and Biklen (1982) discuss this point.

> The data is in the form of words or pictures rather than numbers. The written results of the research contain quotations from the data to illustrate and substantiate the presentation. The data include interview transcripts, memos, and other official records. In

> their search for understanding, qualitative researchers
> do not reduce the pages upon pages of narration and
> other data to numerical symbols. They try to analyze it
> with all its richness as closely as possible to the form
> in which it was recorded or transcribed. (p. 28)

The descriptive nature of qualitative research offers the advantage

that the findings are more easily comprehended by those being

investigated, the subjects. As Stake (1977) points out about case

studies: "[They] will often be the preferred method of research

because they may be epistemologically in harmony with the reader's

experience and thus to that person a natural basis for generalization"

(p. 1).

One further characteristic of qualitative approaches is that

researchers tend to focus on process rather than products and

outcomes. Qualitative researchers are interested in finding out how

people attach meaning to their experiences, how people apply knowledge

to new settings, how their attitudes are expressed in behavior, and

what the natural history of an event or activity has been (Bogdan &

Biklen, 1982, pp. 28-29).

According to Guba (1980) another aspect of qualitative

methodologies is that:

> The naturalistic paradigm rests on the assumption that
> generalizations are not possible, that at best what one
> can hope for are "working hypotheses" that relate to a
> particular context. The naturalistic approach aims at
> developing idiographic knowledge and focuses on
> differences between objects as frequently, and with as
> much interest, as on similarities. (p. 4)

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Along these lines Bogdan and Biklen (1982) point out that qualitative researchers do not set out to prove or disprove hypotheses; rather, the researcher in this paradigm assumes that not enough is yet known about the topic. The researcher constructs an emerging picture as data is collected and parts are analyzed (p. 29).

In this study, qualitative methods were perceived to be the most appropriate means of generating information about the nature of teachers' thoughts as they engaged in the planning and implementation of novel learning activities. The intent of the study was to go beyond the actual behaviors of teachers, their actions and spoken words during a lesson, and find out what thoughts were behind these observable aspects of teaching. Joyce (1978-79) delineates the research approach he believes will make the greatest contribution:

> We take the stand that research into teachers' thought and action requires an intensive indepth analysis and that limited resources be put into this area will be best spent continuing the intensive study of relatively small samples of people rather than rushing to develop general survey techniques.... Our advice to the researchers who will follow us and the practitioners who take seriously the interior lives of teachers is that the greatest productivity, for the time being, will be found in the intimate connections with relatively few people that give us insight into the configurations of their particular minds. (p. 13)

Recently, several investigations have been conducted along the lines suggested by Joyce. Yinger (1977), MacKay and Marland (1978), Morine-Dershimer (1978-79), McCutcheon (1980), and Elbaz (1981), for example, have used in-depth analysis of small samples of teachers to

explore their thought processes. The studies by Yinger and Elbaz focused on the thoughts of a single teacher. The methods employed in these research efforts informed the selection of methods used in this study.

In-depth interviews, a technique used in each of the studies mentioned above, were the chief means of gathering data for this investigation. During the "planning interviews" teachers were encouraged to "think aloud" and reflect on the plans which they were making. Introspective "think aloud" methods have been reported to be successful in eliciting teachers' thoughts about planning and decision making by Peterson and Clark (1978), MacKay and Marland (1978), and Yinger (1977). Additionally, Perkins (1981) indicates that the "think aloud" methodology is successful in eliciting thoughts of people as they are engaged in creative production.

In addition to gathering teachers' thoughts as they planned prior to the lesson, this study intended to capture the thoughts of teachers as they actually implemented the plans. The "inflight" decisions of teachers were captured by the researcher who observed during each lesson. Other investigators (MacKay & Marland, 1978; McNair, 1978-79) report the use of videotape recordings to capture these types of decisions. Such techniques were not used for this study because they were perceived to have a potentially stifling effect on the teachers' creativity. Instead the researcher recorded as completely as possible events felt to reflect significant changes in the teachers' behavior, or changes in the teachers' plans. These

field notes were then used during "post instructional" interviews to stimulate the teachers' recall of the classroom events.

The literature also suggests that teachers' reports in the form of journals (Clark, 1978-79) can be an important source of data. In this study the teachers' journal entries were an additional source of information. The entries were used to stimulate the teachers' recall of their thinking that took place outside of the interview settings as well as during the inflight decisions made in the course of the lesson.

The available research on teachers' thought processes lacked information about the imaging of teachers; at least, evidence that teachers used images extensively was limited. This suggested that there was need for developing a methodology which would access these type of thoughts. The reserach of Elbaz, McCutcheon and Morine-Dershimer provided encouragement that images could be elicited. However, it was questionable whether it would be possible to obtain sufficiently clear descriptions of teachers' thinking through interviews to recognize examples of the thought processes under investigation. Furthermore, it was questioned whether the teachers could be made sufficiently comfortable to discuss freely images which might be considered "off-beat" or "crazy," which can be the case with many creative ideas.

Useful in addressing this concern was the work of Perkins (1981) who offered a series of guidelines for working with people during the "think aloud" process which encourages them to describe their "wild ideas" (pp. 32-35). The incorporation of the guidelines suggested by

Perkins into the interviews was a new and significant departure from previous research with teachers. It was felt that the use of the guidelines could help both the teachers and researcher keep the focus of the interviews on the internal thoughts of the teachers and the way in which the thoughts were perceived, a focus absent from previous investigations.

In the following sections of this chapter the methodology which was employed in the study is described in greater detail. The research setting is the first aspect of the study to be described.

Background Information about
the Research Setting

The investigation took place in an elementary school setting in Amherst, Massachusetts, a town in the western part of the state, having about 20,000 permanent residents. The school is jointly funded by the Amherst public school system and the University of Massachusetts. The school regards itself and is regarded in the community as being innovative. Over the five-year period prior to the start of the study the school had reorganized itself into a non-graded structure with a new curriculum approach built upon the developmental theories of Piaget and others. At the time of the study the school had a faculty of twelve full-time teachers and numerous special subject teachers. The student population is drawn largely from the university community with many of the parents being either students or

employees at one of the area institutions of higher education. The school has a multicultural flavor with about 16 different languages being spoken by students. The population is fairly transient as many parents leave the area following the completion of their degree programs. Because of its proximity to and association with the University of Massachusetts, the school has served as a practicum site for University teacher education programs and has been a setting for numerous doctoral research studies.

The selection of the school as the setting for this study was made primarily for two reasons. First, the innovative character of the school was perceived as an aspect which would help to ensure that the researcher would observe teachers engaged in creative activity. Secondly, the researcher has worked with teachers at the school in several different capacities (research assistant in curriculum development, student teaching supervisor and substitute teacher) during the four years prior to the study. Over this period the researcher had become familiar with the teachers and the school environment, and had developed a rapport with many of the teachers, staff and principal. It was hoped that these previous associations would facilitate teachers' willingness to discuss "wild ideas" more openly with the researcher.

In consultation with the school's principal, a memorandum (Appendix A) was prepared and sent to all teachers in the school informing them of the study and that they would be contacted individually regarding their possible participation. All of the

regular classroom teachers were invited to participate in a pilot study and were consulted concerning the time that they could devote to the proposed study. Seven of the twelve teachers participated in the pilot study while the other five teachers were deselected because they either had no time to participate, or the curriculum with which they were working at the time did not lend itself to much active teacher decision making. An example of the latter was a teacher who was working with an individualized math program in which students primarily followed a prescribed textbook approach.

Based upon the results of the pilot study and discussion with teachers about their ability to participate further in the study, the research participants were selected. At the outset the researcher had decided to work with from three to five teachers. This number would allow the researcher sufficient time to conduct indepth interviews and, at the same time, to work with teachers who exhibited somewhat different styles of planning. The selection of the teachers from those participating in the pilot study was based upon the following six criteria:

1. The teacher must have sufficient free time to devote to the interviewing.

2. The teacher must be willing and able to verbalize experiences, feelings, and perceptions about thought processes, and to utilize visual images.

3. The teacher must be willing to have the researcher observe in the classroom as necessary.

4. The teacher should be willing to plan and implement a learning activity which is novel for the teacher in some respect.

5. The teacher should be willing to have the researcher observe the teacher's planning sessions for novel activities, and to permit the researcher to have access to those plans.

6. The teacher must be willing to document thought processes as they plan for novel learning activities.

Using the above criteria, four teachers were selected to participate in the study, however, this number was later reduced to three when other commitments caused one teacher to withdraw from the study. Before proceeding with the next phase of the study the teachers were further advised about the nature of the research project, this was done both orally and in writing (see Appendix B). Additionally, teachers were asked to read and sign written consent forms (Appendix C).

In the early stages of this type of research, Bogden and Taylor (1975) suggest that it is important to clarify six items: "(1) your motives and intentions, (2) anonymity, (3) final say, (4) royalties; (5) the overall plan, and (6) the logistics of getting started" (p. 105). Regarding the first point, motives and intentions, the teachers were told that the study was part of the research for a dissertation and that the focus of the dissertation was about the thought processes of teachers as they made changes in their plans and implemented learning activities. Use of the terms "creativity" and "creative processes" were avoided to preclude any emotional flavoring which the terms might have to the subjects. Along these lines, Rothenberg (1979a) says: "Most people have definite preconceptions about creativity and when they believe they are being tested for creative

capacity, they respond according to their preconceptions rather than in a natural, spontaneous manner" (pp. 197-198).

The issue of anonymity was raised with each participant and they were informed that it would be difficult to guarantee them total anonymity, although their identities would be disguised through the use of psuedonyms. Disguising their identity was intended to respect their privacy and to encourage the teachers to speak their minds more freely and share ideas that they had of a "wild" nature. To both encourage the teachers to speak freely and have some hand in the final say about the findings, the teachers were informed that they would have an opportunity to read and discuss material derived from the interviews and observations of their classrooms. Royalties were not anticipated to be an issue, however, the participants were informed about how the research would be conducted, how sessions would be organized, and the amount of time that the study would require. Subjects were also informed of the researcher's intent to tape-record all interviews and have the interviews transcribed. Finally, prior to the start of the main body of the data collection, the subjects each met with the researcher and agreed upon times and places for interviews as well as scheduled times for classroom observations. It should also be added that interviews were all held after school and that the teachers were not compensated for their participation.

The Participants

The three teachers that completed the study were all women, with ages ranging from the late twenties to the mid-forties. All were seasoned teachers with from nine to thirteen years of teaching experience, with most of it in the school where the study took place. All were tenured and certified teachers. Pseudonyms were assigned to disguise their identity and to facilitate the presentation of the data. Alice and Debby taught at the middle elementary level; Alice taught a group of seven to ten-year-olds and Debby taught a group of seven to eleven-year-olds. Jessie, the third teacher taught five and six-year-olds. Class sizes ranged from 20 to 25 students.

Alice and Debby had both completed master of education degree programs at the University within the year prior to the study, and both indicated that they regularly took university courses. Jessie indicated that she took courses from time to time, but was not enrolled or intending to enroll in an advanced degree program. All three teachers reported that they regularly worked with student teachers, and all three reported having conducted workshops for other teachers in the school district on a variety of topics.

Researcher -- Participant Relationships

As mentioned earlier, each of the participants had known the researcher prior to the start of the study. The researcher had worked at the school as a curriculum consultant from 1978 to 1981 and had developed a friendly, professional, working relationship with all

three teachers. The researcher had visited the teachers' classrooms on many occasions, had worked with the teachers on the development of curriculum materials, and, from time to time, had presented lessons in some of the classrooms. The researcher maintained ties with the school in late 1981 and 1982 by supervision of student teachers in Alice's and Debby's classrooms and through occasional substitute teaching (none of this in classrooms of the three participating teachers).

The friendships and prior professional relationships were perceived to have a potentially positive effect on the researcher and teacher rapport during the study. It was projected that the teachers and the researcher would be able to establish a more open and comfortable dialog sooner than would be possible with strangers.

One final point worthy of mention was that the researcher and Debby had both been members of a university course together. Although the topic of the course was creativity, the concepts of janusian and homospatial thinking were not raised as subject matter of the class.

Collection of Data

The collection of the data was divided into two main phases. Phase I was the pilot study which has been briefly discussed above. In addition to gathering information about teachers' thought processes, a primary function of the pilot study was to do a preliminary test of the methodology, identify problems with it and to make appropriate revisions. Another major function of the pilot study

was to identify the teacher-participants for Phase II. See Figure 3.1 for a description of the teacher and researcher activities performed during the Phase I portion of the study.

Phase II was seen as the main data collection phase of the study. In this phase there was a six-stage cycle that was repeated twice with each teacher. The six stages of the Phase II cycle are briefly outlined below:

Stage I: The teacher and the researcher meet to discuss the study. The teacher identifies a particular instructional need, concern, or problem. The teacher describes his/her thoughts as plans for the lesson are formed. A date is set for teaching a learning activity addressing the need. The session is taped and transcribed for later analysis.

Stage II: The teacher continues to plan the same learning activity. The teacher keeps a journal of his/her thoughts as they occur.

Stage III: The teacher conducts the learning activity which was designed. The researcher observes the lesson and prepares an interview guide based upon the observation.

Stage IV: The teacher and the researcher review the events which led up to the teaching of the learning activity and the events occurring during the lesson. The interview focuses on the teacher's thoughts which occurred when plans were made and revised. The session is taped and transcribed for later analysis.

Stage V: The researcher documents problems encountered in observing and interviewing the teacher. Appropriate adjustments are made in questions and methodology.

Stage VI: The transcribed interviews are analyzed for evidence of janusian and homospatial thinking. The teacher's journal and other documentation is also analyzed.

The six stages of the Phase II portion of the study were conducted with each teacher for a second time to take advantage of the

Figure 3.1. Phase I: Pilot Study

Stages	Researcher's Activities	Teacher's Activities
Stage I: ENTRY INTO THE FIELD	1. Meets with school principal to get permission to conduct study. 2. Gives all teachers in the school a brief description of the study and invite their participation. 3. Meets individually with teachers willing and able to participate--schedule observations in their classrooms. Discusses logistics.	1. Reads descriptions of study. 2. Meets with researcher and make decision about their partici- pation. 3. Plans time suitable for researcher to observe, and plan an activity to teach that is new in some way to them.
Stage II: INITIAL OBSERVATIONS	1. Observes teacher con- ducting a lesson. 2. Makes field notes about classroom, makes record of activities, notes changes which occur. 3. Prepares interview ques- tions.	1. Teacher presents a lesson lasting from one half to one hour long.

Figure 3.1. (continued)

Stages	Researcher's Activities	Teacher's Activities
Stage III: POST- INSTRUCTIONAL INTERVIEWS	1. Interviews teacher, stimulates teacher's recall of events, discuss teacher's thoughts when changes occurred in the lesson. 2. Tape-records lesson.	1. Describes thought processes used in preparing for and implementing lesson.
Stage IV: SELECTION OF PARTICIPANTS	1. Transcribes tapes of interview and analyzes them. 2. Selects three to five teachers as potential participants for Phase II. 3. Invites selected teachers to continue participation, describes logistics/commitment. 4. Obtains teachers' written consent.	1. Describes if s/he has time and interest in continued participation. 2. Gives written consent. 3. Suggests suitable times to proceed to Phase II of study.
Stage V: REVISION OF METHODOLOGY	1. Analyzes interviews and field notes. Makes needed changes in methodology.	

teachers' increased awareness of their thought processes. It was anticipated that during the pilot study and first cycle of Phase II the teachers would only be starting to become aware of their thoughts; by repeating the cycle it was felt that teachers would tend to become more introspective and reflective about their thought processes. The six stages of Phase II are diagramed in Figure 3.2 and show the activities of the teachers and the research in each stage of the research model. In both phases of the model the researcher conducted all interviews and made all of the classroom observations.

Description of the Methodologies Employed

The four methodologies used in the collection of data were: interviewing -- "think aloud" and retrospective; observations of teachers' implementation of lessons; examination of personal documents -- lesson plans, teachers' notes about their thought processes, etc.; and field notes by the researcher about the observations. Patton (1980) refers to the use of multiple sources of data as "data triangulation." He indicates that triangulation is highly desirable in that it provides a more complete picture of the setting being observed (pp. 108-109). A description and brief rationale for the use of these data collection strategies is given below:

Indepth interviews. Interviewing provided the bulk of the data for the study. All of the interviews conducted in the study were audio taped and transcribed for later analysis. The interviews tended to be of two types, introspective or "think aloud" interviews and

Figure 3.2. Phase II: Main Body of the Study

Stages	Researcher's Activities	Teachers' Activities
Stage I: PLANNING SESSION	1. Introduces teacher to think aloud methodology and leads teacher through a practice session using the approach. (This step was only done during this initial cycle.) 2. Facilitates the teacher's identification of a need, concern, or problem. 3. Using think aloud guidelines, asks teacher probing questions about the thought processes used in planning. 4. Tape records interview.	1. Participates in practice session. 2. Identifies a need, concern or problem to address in a lesson. 3. Describes thought processes as problem is identified and as plans are made to address the problem.
Stage II: TEACHER PLANNING SESSION	NOTE: It was perceived that the researcher would normally not be active during this stage, however, the researcher might perform the following activiteis if needed. 1. Facilitates teacher self-reporting as needed. 2. Attends and documents any interim planning sessions	1. Develops additional plans for the lesson. Writes out plans. 2. Describes thought processes about planning in journal or records ideas on audio tape.
Stage III: LESSON IMPLEMENTATION	1. Observes lesson. 2. Makes field notes about classroom activities, and classroom atmosphere. 3. Following the lesson an interview guide is prepared based upon the observations made.	1. Teaches lesson addressing need, concern, or problem identified in Stage I.

Figure 3.2. (continued)

Stages	Researcher's Activities	Teacher's Activities
Stage IV: POST-INSTRUCTIONAL INTERVIEW	1. Uses interview guide to stimulate teacher's recall of events. 2. Uses probing questions to elicit teacher's full description of his/her thought processes. 3. Tape-records interviews.	1. Recalls thought processes when plans for the lesson were made and as changes occurred during the implementation of the lesson. 2. Describes outcomes of the lesson in terms of their newness and usefulness.
Stage V: REVISION OF METHODOLOGY	1. Revises questions and nature of interviews as needed. 2. Documents changes and revisions.	1. Suggests revisions in interview sessions.
Stage VI: ANALYSIS OF THE DATA Final stages of analysis were completed after classroom observations, planning interviews, and follow-up interviews were completed.	1. Transcribes taped interviews. 2. Using criteria for evidence of janusian and homospatial thinking, analyzes transcripts, field notes, teacher's journals and lesson plans. 3. Identifies possible examples of janusian and homospatial thinking. 4. Shares findings with teacher (only after collection of all data has been made). 5. Analysis revised in light of sharing of finding with teacher. 6. External reviewers examine selected transcripts for evidence of janusian and homospatial thinking. 7. Final analysis made taking into account the various view pionts suggested by the data and the reviewers.	1. Reads transcripts for accuracy. 2. Gives reactions to researcher's preliminary analysis of the data—suggests alternative explanations.

retrospective interviews. The first type of interview, the "think aloud," was used to encourage teachers to describe their thought processes as they actually planned a lesson that they intended to teach. This method of interviewing was used predominately during the planning interviews in Stage I of Phase II.

A "think aloud" strategy suggested by Perkins (1981) was employed to capture the introspective thoughts of the teachers as they planned for their lessons. Perkins describes the strategy as follows:

> The method begins with instructions organized into six principles. The first three promote a complete record and the second three discourage overexplanation.
>
> 1. Say whatever's on your mind. Don't hold back hunches, guesses, wild ideas, images, intentions.
>
> 2. Speak as continuously as possible. Say something at least every five seconds, even if only, "I'm drawing a blank."
>
> 3. Speak audibly. Watch out for your voice dropping as you become involved.
>
> 4. Speak as telegraphically as you please. Don't worry about complete sentences and eloquence.
>
> 5. Don't overexplain or justify. Analyze no more than you would normally.
>
> 6. Don't elaborate past events. Get into the pattern of saying what you're thinking now, not thinking for a while and then describing your thoughts. (p. 33)

For the planning interviews, the teachers were asked to think aloud using the guidelines presented above. The planning began in each session with the researcher asking the teachers to think aloud about an instructional concern problem or need that she was facing with the

class, a particular student, or group of students. Once the teacher
and the researcher had reached a common understanding of a particular
situation, problem or instructional need which presented the teacher
with a somewhat novel set of circumstances, then the remainder of the
interview focused on the teacher's ideas and thinking processes as
plans for addressing the concern, need, etc., were made. During the
course of the interview, the researcher reminded the teacher about the
"think aloud" guidelines as needed, and probed for additional
information when teacher descriptions were insufficiently clear.

Additionally, during the first planning interview, a brief
ten-minute practice session was held. In these practice sessions, the
teachers were given a topic and asked to think aloud about their
thoughts as they planned for an imaginary lesson. The purposes of the
practice sessions were, first to clarify misconceptions about the
kinds of information (images, hunches, wild ideas, etc.) the teachers
were being asked to describe; and, second, to give both the teacher
and researcher time to relax before "starting for real."

The retrospective, "post-instructional" interviews (sometimes
called "stimulated recall" interviews) were predominately used in
Stage IV of Phase II and during the pilot study. The intent of these
interviews was to have the teachers describe their thought processes
which occurred during the actual implementation of the lesson, as well
as those which occurred between the initial planning interview and the
implementation of the lesson. To facilitate the teachers' recall of
the events of the lesson and their thoughts leading up to the lesson's

implementation two means were employed. First, the researcher observed and made a record of significant events that took place during the lessons; and, second, the teachers kept journal records about their thinking during the interim period. Both of these written records were used by the researcher to develop an interview guide which focused on each teacher's thoughts when changes occurred in the planning and implementation of the lesson. Figure 3.3 presents a sample interview guide. These post-instructional interviews were held in each teacher's respective classroom, after school, on the same day that each teacher implemented a lesson. The methods employed during the observations of lessons and review of the teachers' journals is described in the next sections.

Observation. The researcher observed each of the lessons which were taught as part of the study. Each lesson was usually taught one or two days after the planning session in which the teacher began to work out the plans. In all cases the lessons took place in the teachers' classrooms (in one case the class went outside for part of the time) and were conducted as part of the ongoing flow of activities that the teacher might ordinarily do. The specific times for each observation were planned in advance of each lesson between the researcher and teacher, and a suitable place in the classroom from which the observations would be made was designated. For the most part the researcher's observations were "non-participatory," looking on from the sidelines and making a written record of the flow of classroom events. However, teachers occasionally asked the researcher

Figure 3.3. Sample Interview Guide

Introduction: Explain that focus is on changes that occurred and on the teacher's thought processes.

1. What changes occurred in planning or implementation?

    Probe for:

    a. What were you feeling at the time?

    b. What was happening at the time of the change?

    c. What were you thinking about just before the change took place?

    d. Regarding a specific change: Say what was on your mind, tell about any of the wild ideas, images or intentions that you had.

2. A change (<u>describe a change that the interviewer saw earlier</u>) occurred at such and such a time. Describe what was happening.

    Probe as for above.

3. What aspects of the lesson were new for you?

4. In what ways did the lesson serve a useful purpose?

questions about the content, or asked the researcher to look after the class for a minute while the teacher attended to an activity outside of the classroom. At these times the researcher "joined" the class briefly, but returned to an observer's role when assistance was no longer needed.

Teachers introduced the researcher to the children in the classes as a visitor who would be observing the classroom from time to time. Having observers in the classroom was relatively common in the school and was perceived to have little influence on pupils and teachers. Because of the researcher's previous work at the school, many of the students were familiar to the researcher and vice versa, this helped to make the researcher's presence less strange. On the few occasions when children approached the researcher to ask what was being written down, they were told that the researcher was making notes about what was happening so that it could be remembered better later. At times children asked the reseacher such things as how to spell a word or how to do a math problem, in these cases the researcher answered the questions or directed the child to some other source of help without it substantially interferring with the observation or recording of the classroom activitites. These "interruptions" actually gave the researcher a more complete picture of what was happening during the lessons.

Prior to observing each lesson the researcher arrived in the classroom a few minutes early, greeted the teacher, talked with a few students when appropriate, and settled into a place where the

classroom events could be observed easily without being obtrusive. Before the start of the lesson the researcher made some notes about the classroom atmosphere and arrangement of the classroom. During the actual lesson the researcher recorded teacher-pupil dialog (verbatum when possible), teacher activity, pupil behavior, the flow of classroom events and, in particular, any changes that occurred. The focus on changes during the lesson was perceived to be important because this was considered to be a time decision making, planning and/or creative thinking was happening. The researcher actively looked for instances of change, keeping in mind a set of observational cues which might indicate these changes. A listing of the observational cues employed by the researcher are shown in Figure 3.4. While the observation of a particular cue in a classroom setting may not necessarily indicate that decision making or creative thinking occurred, discussion about times when potential changes took place was perceived as a means to help focus the interviews on lesson decision points.

Personal documents. Earlier research by McCutcheon (1981) and this researcher's own experience suggested that teachers' planning for instruction frequently occurs outside of the classroom: driving to work, at a ball game, cooking dinner, etc. Therefore, it was perceived that a system was needed to record the nature and substance of these thoughts, and, to minimize forgetting, to do this as soon as the thoughts occurred as possible. To meet this need, the researcher supplied each teacher with a folder to maintain a journal. Each

Figure 3.4. Observational cues suggesting change

Changes in timing:

1. Teacher alters the length of the lesson -- stops the lesson
    prematurely, or lengthens it.
2. The teacher pauses for several seconds or more.
3. The teacher goes faster or slower than usual.

Changes in mode of instruction:

1. The teacher makes a sudden shift in the instructional technique
    being used. For example, the teacher may shift from a lecture
    approach to a question and answer approach.
2. The teacher presents the children with new options.
3. The teacher reorganizes groups of children.
4. The teacher changes from a visual to an auditory mode of
    instruction, etc.

Change in subject matter:

1. The teacher makes a sudden shift in the lesson subject matter.
2. The teacher searches for and uses a metaphor or analogy which
    helps to get a point across better.

Other cues:

1. The teacher reverses some instructions that were given to the
    students earlier.
2. The teacher acts surprised, angry, or breaks out in laughter.
3. The teacher moves to a new place in the room.
4. The teacher verbally states that some changes are going to take
    place.
5. The teacher does different things than were indicated in the
    teacher's expressed plans.
6. The teacher gives out non-verbal cues that the teacher is
    puzzled, thoughtful or delighted with something.

folder included space for the teacher to record her thoughts about her planning for the lesson and also space for recording the thoughts she had about her thinking. This second aspect was aimed at getting the teacher to actually describe any of the mental images that she had as she made these plans. In addition, the teachers were asked to indicate in their journals the place and time that this "outside" planning occurred. Included in each folder was a slightly modified listing of the "think aloud" guidelines which were described earlier. Examples of the think aloud guidelines and record keeping sheets used in the journals are located in Appendix D.

The folders used for keeping the journals had a spring loaded clip which permitted the teachers to easily add additional pieces of information about their planning which they may have recorded on other sheets of paper. This flexibility was intended to let the teachers plan or record their thought on any sort of paper and not restrict them to recording things only when their journal was handy.

Teachers were presented with the option to record their thoughts about their planning on a tape recorder and use the "think aloud" guidelines. Tape recorders and blank tapes were made available to all of the teachers for this pupose, however this option was not selected by any of the teachers.

The final documentation that the teachers were requested to provide were their actual lesson plans. Teachers were requested to allow the researcher to have access to the plans and jottings they had made in preparation for a particular lesson. Teachers were requested

to number and date plans so that it would be possible to determine the planning stages that a lesson went through as it was being developed.

Researcher's field notes. In order to supplement the data collected through the classroom observations, teacher documentation of their thinking, and the in-depth interviews, the researcher kept field notes about his impressions of the methodology's effectiveness, the attitudes of the participants, and general impressions about the study. These notes were usually made immediately following the interview sessions, observation sessions, or meetings with the teachers. These field notes were a means of documenting the researcher's reflections about the study and his impact upon the data collection process.

Data collection timetable. The study took place during the spring of 1982. The first pilot study was conducted in February, procedures were refined, and two more were conducted in April. All other pilot studies were completed in the first half of May. Phase II participants were identified by the third week in May, and Phase II data collection began later that month. All observations and interviews were completed by June 22, 1982. Data analysis began during the pilot studies, however the bulk of the analysis occurred during the summer and fall in 1982. A preliminary analysis of the data was presented to the participants for their review and comment in December and January. Details of the data analysis procedures are presented next.

Analysis of the Data

Data from the study consisted of interviews which were audio
taped and transcribed, teachers' personal documents in the form of
lesson plans and journal entries, and researcher field notes which
included notes from the lesson observations. All of the written
documentation was photocopied; one set of data was filed for
safekeeping and several sets were used during analysis. The
researcher analyzed the data for three things: (1) evidence of
janusian thinking; (2) evidence of homospatial thinking; and (3)
descriptive information about the methodology and its effectiveness.
The photocopied materials were read by the researcher, separated, and
filed as appropriate in each category. The criteria which were used
for identifying examples of janusian and homospatial thinking are
shown below:

Criteria for Evidence of Janusian Thinking

1. Antitheses, opposites, contradictions, paradoxes, or
   reversals were evident.

2. Opposing elements were simultaneously juxtaposed.

3. An original and useful product, solution, or idea was
   developed by the teacher.

4. The teacher was consciously aware of thought processes.

Criteria for Evidence of Homospatial Thinking

1. Multiple images were evident.

2. Images were superimposed or fused.

3. An original and useful product, solution, or idea was developed by the teacher.

4. The teacher was consciously aware of thought processes.

In the initial analysis of the data, any evidence that criteria one or two had been satisfied for either janusian or homospatial thinking warranted placing the example or description of an event into a file for further analysis. Subsequent reviews of the material selected in the first analysis were made to find the extent to which the examples satisfied all of the necessary criteria. The written documentation for each example which was perceived to satisfy most or all of the criteria was extracted from the transcripts, journals, etc., and submitted to the participants to check for accuracy. Next, the participants were informed about the exact nature of the study and were given a one hour training session about the theory of janusian and homospatial thinking. The terms were defined and examples from Rothenberg's work were discussed. Following this session, the participants were asked to examine the transcripts for what they perceived might be evidence of the thinking processes.

The researcher met individually with each teacher and presented his preliminary analysis. In these meetings which lasted from one and one-half to two hours long, the teachers were encouraged to offer their opinions, agree or disagree with the researcher's analysis and to suggest alternate explanations of the data. Each of these interviews was taped and transcribed for later analysis. Based upon each teacher's reaction to the data and the researcher's analysis, the

data were reassessed and a revised analysis was made to take into account the new perspectives which the participants offered.

Review by External Judges

The same transcriptions which were shared with the participants were also submitted to two external judges for their analysis. The two judges were colleagues of the researcher, they were advanced doctoral students in education who were interested in teacher creativity and were both familiar with Rothenberg's work. The researcher prepared the judges by providing a three-hour training session on the identification of janusian and homospatial thinking. The training session consisted of a presentation of the definitions, discussion of various examples from Rothenberg's work, discussion of evidence of the thought processes in art work and humor, and assessment of two short transcripts of interviews with teachers which suggested elements of the thinking processes. The reviewer judges read through the transcripts and recorded their judgments about the presence of janusian or homospatial thinking on evaluation sheets provided by the researcher (See Appendix E). The judges and researcher then compared their views.

After the training session the judges were provided with evaluation sheets and sets of transcripts which the researcher selected and had previously discussed with the participants. The judges took two days in their spare time to review the examples and make assessments of the data. The judges worked separately, then met

with the researcher for a period of six hours to compare and discuss their independent analysis of the data. Their analysis was intended to either confirm or disconfirm the researcher's analysis and to generate alternative explanations about the teachers' thought processes. The judges views were tape-recorded to capture their perspectives as faithfully as possible.

Following the review of the examples by the external judges the researcher prepared a final analysis of the examples, presenting alternative explanations of the data where they were suggested.

Analysis of the Methodology

The data from the transcripts, field notes, and teachers' journals which pertained to the methodology and its effectiveness were extracted from the written documentation and placed in a file about the methodology. The material in this file was then sorted and categorized under headings which emerged during the analysis process.

Another approach to the analysis of the methodology was to document the occurrence of examples of janusian and homospatial thought process, and correlate this with particular phases of the methodology, or questions which were asked. By making these correlations it was hoped to determine if particular aspects of the methodology were more or less successful in eliciting evidence of janusian or homospatial thinking.

Trustworthiness of the Findings

"Trustworthiness" is a term used by Guba (1980) to refer to four areas of concern to researchers in both the scientific (quantitative) and naturalistic (qualitative) paradigms. These four concerns are: (1) truth value, (2) applicability, (3) consistency, and (4) neutrality of the findings (Guba, 1980, p. 9). Guba explains that the four areas of concern are addressed differently in the two paradigms. In light of the naturalistic or qualitative investigator's concerns, the means employed in this investigation to assure the trustworthiness of the data are described below.

The first concern, "truth value," in the qualitative paradigm, is described by Guba (1980) as ensuring that the findings are "credible." This study took four steps which Guba suggests as means to help assure credibility. First, the researcher spent an extended amount of time with the teacher participants. Three to five hours were spent in direct observations of the teachers in their classrooms, and an additional eight and one-half to ten hours was spent interviewing each teacher. The extensiveness and depth of these interviews and observations helped the researcher to obtain a fairly clear picture of how each teacher approached curriculum planning and lesson implementation on a daily basis. Second, different sources of data collection were used which enabled perspectives gained from different methods to be checked against one another. Third, after the data were collected the researcher sought other explanations that could account for the findings, these other perspectives have been

presented in the findings where they were perceived. Fourth, the preliminary analysis of the data was subjected to a "member check," that is, the participants were presented with the researcher's analysis and invited to offer their perspectives, to confirm or disconfirm the anlaysis, or suggest alternative interpretations.

"Applicability," the second concern described by Guba, is referred to as "fittingness" in the naturalistic paradigm (p. 11). Addressing the issue of fittingness, Guba states:

> The naturalist eschews generalizations on the grounds that virtually all phenomena are context-bound. It is not possible, he believes, to develop truth statements that have general applicability; rather one must be content with statements descriptive or interpretive of a given context -- idiographic or context-relevant statements. (p. 18)

Two steps were taken in this study to ensure that the findings would be context relevant or "fitting." First, during the study, "thick" descriptive data was collected about the teachers' thought processes; and secondly, these thick descriptions of the teachers' thoughts and the settings are presented in detail in the following chapter. These descriptions are intended to enable the readers of the study to make judgments about the extent to which these findings might be related to other teachers in other settings.

The concern for "consistency" or "dependability" of the findings refers to the qualitative researcher's desire that data be stable over time. Guba (1980) recommends that steps be taken to assure data stability because methodological approaches may be refined during the course of a study or the researcher may become more skilled in his/her

approach (p. 19). This study employed two methods suggested by Guba to help in this regard. First, the study employed several different methods for the collection of data. Strengths or stability in one method may compensate for weaknesses or variability in another. Secondly, methods employed by the researcher have been explained in sufficient detail to permit others to replicate the research.

The final area of concern is that of neutrality. In the naturalistic paradigm, Guba says that the researcher is not so much concerned with objectivity as with "confirmability" (p. 20). Biases of the investigator are recognized as unavoidable, the paradigm recognizes this and "...shifts the burden of neutrality from the investigator to the data" (p. 12). Three steps were taken in the study to ensure confirmability: (1) the process of collecting data through several data sources was intended to help assure that the findings could be confirmed through independent means; (2) the researcher has attempted to reveal to the reader biases or assumptions which caused the data to be interpreted in a particular way; and, (3) external judges were engaged to examine the data and independently analyze the findings for evidence of the thought processes under investigation.

C H A P T E R   I V

PRESENTATION AND DISCUSSION OF THE RESULTS

Organization of the Chapter

This chapter opens with a discussion of the nature of the findings and is followed by a presentation and discussion of six specific examples which were perceived to contain elements of janusian and/or homospatial thinking. Coming after these are other selected examples of a less detailed nature. Next, general findings about the two thought processes are summarized and presented. The chapter closes with a presentation and discussion of findings about the usefulness and suitability of the methodology employed to gather the data.

Nature of the Findings

Janusian and Homospatial Thinking. The data consisted of transcribed interviews with the teachers, notes from the teachers' journals, and the researcher's observations and field notes. The researcher examined the various sources of data for evidence of janusian and homospatial thinking using the criteria listed below:

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Criteria for Janusian Thinking

1. Antitheses, opposites, contradictions, paradoxes, or reversals were evident.

2. Opposing elements were simultaneously juxtaposed.

3. An original and useful product, solution, or idea was developed by the teacher.

4. The teacher was consciously aware of the thought process.

Criteria for Homospatial Thinking

1. Multiple images were evident.

2. Images were superimposed or fused.

3. An original and useful product, solution, or idea was developed by the teacher.

4. The teacher was consciously aware of the thought process.

Analysis of the data revealed several examples that satisfied some of the criteria for either janusian or homospatial thinking. Although there was compelling evidence in some cases, no example unequivocally satisfied all of the criteria for either process. The nature of the data caused the researcher to describe certain examples of teachers' thought processes as "janusian-like thinking" or "homospatial-like thinking," in that they did satisfy several criteria but only partially satisfied others. In many cases ascertaining the presence or absence of a particular thought process was a matter of degree. In examples of janusian thinking there were questions of the degree of simultaneity, while in examples of homospatial thinking the degree to which distinct entities were fused or superimposed was often ambiguous. In distinguishing both processes there were frequently

questions regarding the degree to which the teachers were consciously aware of their thinking and the degree to which new or useful products or effects resulted.

In the presentation of the results of this study, the findings are discussed in terms of the degree to which teachers evidenced janusian or homospatial thinking in their planning and decision making. The broader conceptualizations of "janusian-like thinking" and "homospatial-like thinking" blur some of the finer distinctions Rothenberg incorporated into his theory. However, broader conceptualizations of the two processes which account for varying degrees of superimposition, simultaneity, etc., enable this researcher to account more accurately for the teachers' thought processes observed during the course of this study. The difficulty of identifying specifically the thought process also suggests that there may have been deficiencies inherent in the methodological approach used in the study. The successes and limitations of the methodology are described in the last portion of this chapter.

Specific Examples

This section is divided into two parts. In the first part six specific examples are presented in depth. These examples were selected for presentation because they most clearly illustrated aspects of janusian and homospatial thinking. Each example is presented and discussed in terms of how well it satisfied the criteria

set forth for the two processes. The researcher's analysis is woven into the presentation of the examples; the views of the teacher participants and the analysis of the external judges are also presented. Relevant interview transcripts and journal entries for each example appear in Appendix F. The examples are grouped and presented by teacher, with examples from Jessie given first, Debby second, and Alice third.

The second portion of this section presents additional examples that suggest janusian and homospatial thinking, yet that were not complete or clear enough to permit in-depth analysis. The examples are presented to illustrate the richness of the teachers' use of imagery and opposition in their planning and decision making.

Example 1: Giants, Midgets and Clowns (Jessie)

Background Information

This example emerged during a planning interview with Jessie who was working with a group of five and six-year-olds. She had decided to teach a measurement lesson and to integrate measuring activities with the "circus theme" that the class had been studying for the past week. Jessie's initial idea was to have the children do some jumping, then measure and graph the distance of their jumps. She also thought of having the children compare the size of the steps that they took during a mock "tightrope walking" activity. As the teacher continued

to think about how she would implement and extend the activity, she described some visual images which had elements of janusian and homospatial thinking. The janusian element is considered first. Related interview transcripts appear in Appendix F., Example 1.

Janusian Element -- Giants and Midgets

Following mention of the tightrope walking activity, Jessie paused for about five seconds and then started to write something into her journal. The researcher asked, "What are you thinking right now?" Jessie replied:

> Mmm, I was thinking about measuring, for decorations for the room, we could make giants, men on stilts, and midgets and that kind of thing.

When asked about any images she had at the time, she explained:

> I was thinking about a giant that we did once where his legs went right up over the door; and the kids would walk right between his legs when going in and out of the classroom and they really liked that...."*

These excerpts suggest that the teacher had juxtaposed two extremes in human size. She juxtaposed them in the sentence in which she first described the idea, and secondly she juxtaposed two extremes in size when she later explained her image of the children juxtaposed with the giant, walking through his legs. The image appeared to preceed the statement she made about the giants and the midgets and it seems likely that her image of the five and six-year-olds suggested to

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*It may be more than just a coincidence that as Jessie paused to think just prior to having this idea, she had been looking in the direction of the classroom door.

her an image of midgets in comparison to the giant. The teacher did
not elaborate on the idea further at this point, she temporarily gave
up the idea and returned to the jumping activity she had thought of
earlier. When the teacher finished planning for the lesson she was
asked to listen to a tape recording of the session and comment about
her thought processes. As she listened to her statements about the
giants and midgets she said the following.

> I know that I was thinking about large and small,
> comparison kinds of things with the giant and midgets
> and I think that probably that's more arts and craftsy
> kind of things, that there wouldn't be enough
> comparisons to make and it didn't seem worthwhile to
> plan a whole lesson around that.... I thought about the
> giant and then I thought about what would be the
> opposite of that -- what would be the comparison.

The teacher's images and comments about her thought processes
offer some evidence that janusian thinking was used by the teacher.
Regarding the first of the criteria, opposites, two extremes in human
size, were brought together and juxtaposed in the teacher's image of
the young children walking through the giant's legs. This contrast in
size produces a striking visual juxtaposition. Giants and midgets (or
young children) are very different in size, yet both are members of
the human race. The juxtaposition of the two in one image serves to
encapsulate the dimension of size in the species.

For the second criterion, there is some question about whether
the teacher simultaneously juxtaposed the extremes or whether they
were perceived in a sequential fashion. There is evidence to support
both interpretations. Supporting the case that Jessie simultaneously

perceived opposing elements was the observation that in her first reference to the topic she juxtaposed the two opposing elements in the sentence. She says she was thinking of "giants, men on stilts and midgets..." Additionally, she indicated that in her image the children were walking through the giant's legs -- the extremes in size are simultaneously juxtaposed in the image. In contrast, the teacher says that she saw the giant and then thought of what would be opposite, which suggested that the opposites were brought together in a step-wise fashion. This researcher favored the interpretation that the opposites were perceived simultaneously; first, because of the compelling nature of the juxtaposed image of the giant and the children, and secondly, because Jessie's initial comments are perceived to more accurately reflect what she was thinking at the time. Her retrospective statement appeared to be offered as justification for her thoughts that would be most likely to make sense to an outside observer.

Another possible explanation is that Jessie may have both conceived of the opposites simultaneously at one moment or several different moments, and at other times considered the opposites separately in a sequential fashion. In other words it is conceivable, or even likely, that janusian and dialectical type processes were operating in close proximity to one another in this instance.

In reference to the other two criteria, Jessie's comment, that she "was thinking about large and small," strongly suggested that she was engaged in a <u>consious</u> attempt to solve a particular problem when

she formed the idea of the giants and midgets. The criterion that a new and useful product or effect be developed appears to have been satisfied in that Jessie later elaborated the idea into a clown sequencing idea which would satisfy her needs. However, the idea was not fully developed or implemented.

The external judges analysis. The independent analysis of the interview transcript by the judges were much in agreement with the analysis presented above. Both reviewers identified as opposing elements, large and small (giant and midget), and felt that the teacher had probably perceived them simultaneously and was conscious of her thinking, although neither judge was entirely sure about these last two elements. Both judges felt that the teacher ultimately produced a new and potentially useful lesson idea to use with her students.

Homospatial Elements

Later in the interview Jessie modified the giant and midget idea into a sequencing activity which used clowns of varying sizes. The teacher was asked what came to her mind at the time she changed the idea to clowns, and whether she was actually seeing clowns. The following discussion took place between the researcher (R) and teacher (J).

J: I think that I must have been (seeing clowns), because it changed from giants to clowns without me making that as a conscious decision. Well giants aren't really circus. Clowns are circus, and you're now thinking about a giant just because you need a giant to be really big, then it could be clowns and

they could be of any size. So I think I really saw you know
this kind of a billowy, that kind of a clown suit (makes a
sketch in the journal; see below).

R: And pants?

J: And pants.

R: As you are drawing?

J: Right, those the kids could do cause it's triangles and circles,
      and you could give them paper for them to measure how much they
      want. So they would be working on measurement and also -- but I
      think that this (jumping and measuring activity) is much more to
      the point.

The researcher in analyzing this excerpt, felt that it was

possible that the teacher had superimposed or fused images of the

giants and midgets with the clown images. While this still seems like

a possibility, the teacher when questioned in the final interview

could not confirm this view. She did however, indicate that she

simultaneously saw the clowns and geometric-shapes of triangles

combined with one another:

> I'm looking at it right now and I'm seeing clowns, but
> I'm also seeing triangles and circles and the shapes
> where they fit into the clown. So I'm seeing both the
> concept of the clown but also the geometric lesson that
> (would) be involved here, and I can see it
> simultaneously.... (the teacher reads over the
> transcript again) I'm sure that's the way that that
> would have happened (reads transcript again). So I saw
> those and saw the geometric shapes put on top of those,
> and the other lesson came out of it but it isn't really
> what we started out to do. So that would be as close as
> I could think about what we were talking about when we
> talked about the homospatial.

This testimonial to a homospatial-like process was given by the
teacher after she had been informed about the theory and should be
viewed with some skepticism. Although the teacher contradicts
herself, saying in one place that the clowns and shapes fit into one
another and in another place she said that the shapes were placed on
top of the clowns suggesting that they were not fused, it does appear
that a homospatial-like process involving a fusion of the clowns and
geometric shapes may have occurred.

The researcher felt that the teacher may have also fused images
of her students with the images of the midgets which went through the
giant's legs with images of the midgets. This belief while still
possible was not able to be substantiated.

External judges' analysis. Initially the external judges did
not agree that the interview showed evidence of homospatial thinking.
One judge saw no evidence, while the other felt that there was clear
evidence that the teacher had fused images of the clowns and geometric
shapes, and in another case had fused images of the giant and midgets
with the images of the clowns. After discussion it appeared that

there was insufficient evidence to judge that the teacher fused images of the clowns with the images of the giant and midgets. However, upon re-examination of the transcript, a consensus emerged that it was possible but not entirely clear that the teacher had fused or superimposed images of the clowns and geometric shapes of the clowns. The judges had difficulty determining the degree to which the teacher was conscious of her thought process. They agreed that she was consciously working on a plan for a lesson, however, she was not specifically aware that she was making superimpositions or fusions. Both judges were in agreement that the clown sequencing idea was a new and potentially useful activity which the teacher could use, and that the idea of teaching a geometry lesson in conjunction with making the clowns was, for the teacher, a new and potentially useful idea.

Concluding Remarks

The idea of the giant, midgets, and clowns went no further than the conceptualization stage. The potentially useful idea of having the children construct a sequence of clowns of varying sizes satisfied the teacher's goal of combining a measurement activity with the "circus theme," however, she opted for a "more to the point" activity.

To say that the lesson ideas satisfied the criteria that the product was entirely new was difficult to confirm. The lesson ideas did have elements of newness. Jessie showed enthusiasm for the clown idea, she felt that it would be fun, she had never done the activity

in these ways before, nor had she done things like this with that group of students. When Jessie was asked to explain what was new about the ideas she said, "It's hard to tell because a lot of these things that we are talking about here are built on other lessons that I've done before..." The teacher's idea, however, was uniquely well suited for the situation and could have satisfied the needs she had planned to address. The conclusion here is that the teacher's idea was potentially useful and new to her in some degree -- she created a plan which could have been implemented. Even though the lesson ideas were not implemented during the course of the study, janusian-like and homospatial-like processes were in evidence in the formation of the ideas.

Example 2: Keeping the School Clean (Jessie)

Background Information

Two separate but related episodes comprise this example. Both episodes concern ideas that Jessie had about getting children in her classroom to be more respectful of each other, the classroom, and the school environment. The teacher's assessment of the difficulties she saw emerging in the class were:

> The problem that we have is a lack of respect for each other and the environment in the classroom and the fact that it is getting to the place where I don't feel comfortable living in it and I don't think that's good

for them to begin to feel comfortable living in it....
Part of it is just respect for each other...then the
other is just the plain litter and, ah, finishing,
putting things away when you finish, wiping up where you
have been so that the next person won't put their paper
down where it is wet....

As Jessie began to consider ideas that she might use to address the

problems she described above, she recalled an activity that she had

seen in an educational magazine. The lesson idea was called the

"apple core activity." Her thoughts about using this approach are

described in the first episode. The second episode involved a fantasy

that Jessie had on the morning that she was scheduled to begin a

school clean-up activity with her class. Related interview

transcripts appear in Appendix F, Examples 2-A and 2-B.

Episode 1 -- Apple Core Activity

Jessie indicated that the "apple core activity" was a lesson

idea which she had seen in Learning Magazine* several years earlier.

She said she had saved the article and had filed it away expecting to

use it at some point. Jessie related that the concept behind the

activity was "...you spend a certain length of time where you are not

allowed to pick up anything or put anything away, there is no cleanup

activity." The strategy was that the children would become more

attentive to the need to keep the room clean, if they had to live for

a while in a messy room.

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*A subsequent search in the teacher's files indicated that the
"apple core activity" came from some other source, and it was a
different activity from the one that she described in this example.
The source of the idea could not be found and the teacher appeared to
have confused the name with another activity.

Janusian Elements

The idea that the students would learn to keep the classroom environment cleanre by making it dirtier has a contradictory aspect. This contradictory aspect suggested that the activity embodied a janusian conceptualization -- simultaneously cleaning and dirtying the room. The teacher was aware of the irony of the activity and this appeared to attract her to consider using the lesson. However, Jessie did _not_ develop the apple core activity on her own, she merely recalled it. Therefore, this would not be considered an example of the teacher employing janusian thinking.

External reviewers' analysis. Both reviewers felt that there was little evidence to suggest that the teacher was using janusian thinking. The reviewers did note the contradictory elements in the apple core activity but indicated that these were not the product of the teacher's thinking, nor was it clear to the reviewers that the contradiction necessarily involved any simultaneous juxtaposition of opposites. The idea may have originally been produced through a sequential consideration of consequences of first letting the room get dirty, then the class getting tired of the dirt, etc.

Homospatial Elements

Jessie described numerous visual images which she had as she was thinking about the apple core activity. Some of the images led the researcher to speculate that the teacher may have used homospatial thinking in her planning. The excerpts from the interview between the researcher (R) and Jessie (J) display some of the teacher's images.

R: What are some of the hunches or intutitions, guesses, wild
    ideas, images or intentions that you might have had in regard to
    thinking about this?

J: I guess that I feel like it's not going to be an easy one to put
    together. I have this vision of the room filling up with
    wastepaper and doing one of those days where no one is allowed
    to pick anything up. I mean you read about them in Learning
    Magazine and things. "All right you do not need to put things
    away -- do not put things away."

    (A few minutes later in the interview the teacher reflected more
    about her images of the activity.)

J: When I was thinking of the apple core one I was almost seeing
    the kids walking around the room in wastepaper up to their
    calves or their knees or something like that. I was also
    thinking that some of them wouldn't notice that it was there.

R: You saw specific students that would not notice, it, or--?

J: I saw specific students, I don't know whether they would notice
    it, but they were the ones that were most active today, needed
    most of my attention, so I think that's why they're coming
    specifically to mind now....

Homospatial images might have occurred in several ways. Two

possibilities are listed below.

1. The teacher superimposed a visual images of a room in a messy
    and chaotic state with an image of a clean and smoothly
    functioning classroom.

2. The teacher superimposed or fused images she remembered from
    reading the article in the magazine with images of students in
    her class walking around in a mess that they created.

While these and other possibilities exist, there was no direct or

convincing evidence to support the conclusion that homospatial

thinking occurred.

External reviewers' analysis. Neither of the reviewers found

any evidence of homospatial thinking in the interview transcripts

(Appendix F, Example 2-A) for this episode.

New and Useful Products

No new or useful product emerged from Jessie's thoughts about the apple core activity during the planning session interview. In fact, the teacher gave up the idea of doing the activity and decided to do a litter cleanup campaign in and around the school. The teacher decided against the apple core activity for several reasons: (1) the children might get too excited and things would get out of hand; (2) the children would not understand the irony of the activity; (3) it would involve coordinating things with the janitors and she felt like she would have to clear the idea with the principal; and (4) on the day following the planning interview the children were very tidy and had not messed up the room, suggesting that the idea might not work.

Concluding Remarks

Examination of this episode helped to define instances of when the processes of janusian and homospatial thinking are not being used by the teacher. An activity with ironical or contradictory elements is not evidence of janusian thinking while visual images which are not superimposed or fused provide no evidence of homospatial thinking.

Episode 2 -- The Soap Suds Fantasy

Although no new or useful products or effects were judged to have occurred during the planning session discussed above, the teacher did have a fantasy on the morning that she had planned to do the litter cleanup campaign. This fantasy seemed to parallel the idea of

the apple core activity to some extent and may have been an extension
of her earlier thoughts about it. The connection between the two and
janusian and homospatial-like elements are discussed below.

Background Information

It was a rainy and foggy morning on the day Jessie planned to do
the litter cleanup campaign. While still in bed that morning she
started thinking about the activities of the day and then she reported
having a kind of dream fantasy. Later that morning she recorded the
fantasy in her journal. The notes that she made are shown below.

Journal Entry

Plans for Learning Activity	Thoughts About Thinking
Wed. morning in bed--talk about one way of be (sic) good citizen--keep environment neat--make two lists--things dropped inside--outside--two teams-- (aide) and I -- take walk	Mind wandered off into fantasy of people dropping soda (sic) & stuff and rain coming and filling world with foam.

The weather cleared later in the morning in time for her to have half
of the class do the cleanup activity outside on the school grounds as
she had intended (half of the class performed their cleanup activities
inside of the school). After the lesson in the post-instructional
interview, Jessie described more about her early morning thoughts.

> Mm, it may not have been the first thing, but it was in
> the process of waking up in the morning and saying that
> "I can't get up today." And then, "What is today?
> Gary's coming in, this is what I'm doing," And then I
> had kind of purposely put off really writing the lists
> out, partly because my natural way would be to plan the
> week kind of grossly and then I usually get in around
> seven thirty, sit down and write it out then; and so in

the morning before I get up I usually go over the
meetings I have and if there are any things that are
left over to do like the morning meeting and that
lesson, I sort of go over it then, then it's sort of
gone again until I get to school and sit down and block
it out. So that was (pause) and then I don't know
whether I went back to sleep and then dreamt this, I'm
pretty sure that I didn't but -- (spoken haltingly).

More details of the fantasy which specifically relate to janusian and
homospatial thinking are discussed on the following pages.

Janusian Elements

Jessie's description of her fantasy suggested that she
juxtaposed the opposing ideas of making the environment dirty and
cleaning things at the same time. Directly following the excerpt
above, the researcher (R) and the teacher (J) explored her images
further:

R: That's what part (of the fantasy)?

J: About people dropping, then I sort of, sort of, went off into
    this fantasy of people dropping, what, what kinds of things do
    people drop? And then all of a sudden, I had them dropping all
    this soap* and stuff on the ground and the rains came down and
    the whole thing foamed up and then I thought, "I'm going to have
    to write this down," (laughing), but I really didn't wish to do
    it. Yeah, I went off on a tangent and it really didn't have
    anything to do with the lesson at all, but it was kind of fun to
    think about.

---

*There was an inconsistency between the teacher's journal entry
and what she described in the interview. The teacher indicated in the
interview that the people were dropping "soap." In the journal the
teacher only made reference to "soda" being dropped. In the final
interview the teacher could not account for the difference. Her
repeated reference to soap in the interview suggested that it was soap
and not soda that she saw, or perhaps she saw both.

The contradictory element of Jessie's images was that she had people dropping things on the ground (littering), but at the same time they were dropping soap -- a cleaning agent. Together in one "visual" image the teacher conceived of people simultaneously making the environment "dirty" and "clean." In regard to the teacher's conscious awareness of her thought processes, Jessie indicated that she had actively manipulated the imagery in the fantasy, but the extent of her awareness of the contradictory nature of the fantasy was never verbalized. Therefore, some question remained as to the extent of her conscious awareness.

The product of the teacher's soap suds fantasy was the fantasy, the idea of littering with soap. The idea was new to the teacher, however, she dismissed it all as having nothing to do with the lesson. In fact the "wild" nature of the fantasy appeared to make the teacher reluctant to talk about it and she tried to limit the discussion. The soap suds fantasy never resulted in any actual instruction, although the researcher perceived the concept of simultaneously cleaning by littering as a potentially useful theme for a lesson in the future.

One other janusian aspect was suggested by the data. Just before the teacher began to think of the things that people drop she had been thinking about the things that students would be likely to pick up on their cleanup campaign. She searched for ideas about what they would find by visualizing what kinds of things people would be dropping. In a sense she got ideas by reversing the situation. The researcher believes that Jessie may have juxtaposed or superimposed

images of her taking a walk with her students to pick up things with images of people dropping things. Insufficient evidence was present to confirm or disprove this possibility.

External judges' analysis. Initially both judges indicated that they perceived no evidence of janusian thinking. One judge noted that there was an "inside"/"outside" division of the class and that the teacher spoke in terms of a littered vs. a clean environment but no evidence that the teacher conceived of these opposites simultaneously was observed.

When the researcher shared his analysis of the soap being littered, both of the judges acknowledged that this was an element of janusian thinking that they had overlooked. The group arrived at a consensus that supported the analysis presented earlier by the researcher.

Homospatial Elements

Jessie used many visual images to describe her thinking, however, no clear evidence was found to indicate that she had superimposed or fused images.

External judges' analysis. The external reviewers observed no evidence of homospatial thinking.

Concluding Remarks

These two separate but related episodes in the teacher's planning were for a lesson to make children in the class more

respectful of each other and of the classroom environment. In the initial planning session the teacher's attention was drawn to a lesson idea called the "apple core activity" but she finally decided to conduct a litter cleanup campaign.

It was reasoned that the teacher's remembrance of and attraction to the ironical nature of the "apple core activity" did not constitute evidence of janusian thinking. However, the teacher's soap suds fantasy, which was somewhat similar to the apple core activity in that both "cleaning" and "dirtying" aspects were involved, juxtaposed littering with dropping a clean agent. The juxtaposition suggested a janusian process was involved, although the teacher appeared not to grasp the significance or potential usefulness of the idea of simultaneously littering and making the environment cleaner, and the idea was not developed into a lesson. Because no development of the idea occurred, this example does not entirely satisfy all of the criteria set forth at the beginning of the investigation. This example, raises the question of whether an elaborated product is a necessary criterion for evidence of a janusian thinking process or whether a juxtaposition of opposing elements which is recognized to be a potentially useful conceptualization is sufficient.

In regard to homospatial thinking, neither episode was judged to offer any convincing evidence that images, discrete entities, or sensations were fused or superimposed.

Example 3: Marie in Puerto Rico (Debby)

Background Information

In a planning session held two days earlier, Debby had decided that she needed to give Marie more attention. Marie was from Puerto Rico and the teacher wanted to help Marie see how special her Puerto Rican heritage was, and also to help other students in the class gain a better understanding of that culture. It was also decided that Marie and her mother would be asked to give a one hour presentation to the class about Puerto Rico. A three-way meeting was scheduled between Marie, her mother, and Debby to plan the presentation. The example which follows is drawn from the three-way meeting and the interview that the researcher had with the teacher after she had made plans with Marie and her mother. During the meeting with Marie and her mother, Debby tried to clarify the situation and help Marie think of some ideas by suggesting that Marie imagine herself back in Puerto Rico and think of what she would want to know from someone from Massachusetts who came to her school. Janusian elements were suggested by the reversal of the situation, and accompanying images suggested an empathic homospatial process had been employed. Evidence of the two processes is presented below. Related interview transcripts appear in Appendix F, Example 3.

Janusian Elements

Early in the three-way discussion Marie was having some difficulty thinking of things to present to the class. The following discussion took place in which the teacher (D) tried to help Marie (M) come up with some ideas.

D: So what do you think? What can we plan?
   (Seven-second pause)

M: I don't know.

D: Well think of it this way, think of being, ah, you're in Puerto Rico and you're in your classroom; we got two kids who just came from Massachusetts. What are some of the questions that you would ask them? What would you want to know about? In one of those poems that you talked about what was the first thing that was so amazing? You tell me.

M: Snow.

D: Yeah, the weather. The weather is very different.

M: Very, very, very.

(End of excerpt)

Debby's suggestion of having Marie reverse her role and imagine herself in her old school and imagine what she would ask someone from Massachusetts about that place, was intended to help Marie think of things to tell the class about Puerto Rico. The teacher recognized that the questions students would have in either case would be the same. The teacher explained this in the interview which followed her planning with Marie:

> I was trying to put her in the situation of you're the kid who came into the new school. "Picture yourself at the comfort level of being in the old school. You weren't the odd one, you weren't the strange one.

Picture two of our kids walking into your classroom and
you've never been to America. What would you like to
ask them?" I was trying to get her to think of the
question that she would ask, that these kids would ask,
they would be the same questions.

The first criterion, that there be evidence of opposition, in
this case a reversal of elements, appears to have been satisfied.
Additionally, the reversal of the situation was a <u>conscious</u> attempt on
Debby's part to make the situation more concrete for Marie and think
of things to present to the class. Lacking is clear evidence that
Debby simultaneously conceived of Marie in Massachusetts and Puerto
Rico. It is possible that the teacher momentarily saw Marie in both
roles -- telling information and asking for information, but this
could have been a process of sequentially considering one situation
and then the other. The degree to which the two conceptualizations
may have overlapped was difficult to determine. In the final
interview Debby indicated that she felt that the thoughts had occurred
to her sequentially.

The final criteria of a new and useful product or effect being
formed was partially satisfied. The idea of reversing situations was
not new for the teacher, but her application of the reversal in this
particular situation was new in that the reversed elements were ones
that she had not worked with before. The novelty of the teacher's
approach was also questioned from another standpoint, because the
child's mother posed the question, "What do you like if you are a
children (sic) here in the classroom?" to Marie about four minutes
earlier in the interview. The mother's question did not reverse the

situation in the manner or to the extent that the teacher's suggestion did later. However, it seemed possible that the teacher may have consciously or unconsciously grasped the suggestion of reversal in the mother's statement, elaborated upon it and used it later.

Assessing the usefulness of the reversal suggested by the teacher was difficult in that the teacher gave many other kinds of suggestions and prompts. For example, just after suggesting the reversal, Debby asked, "What had surprised (Marie) when she got off the plane in Boston?" Marie picked up on the last question and answered, "Snow," and the discussion went on to other topics. Despite the lack of clarity, both the teacher and researcher felt that the reversed situation held potential for helping Marie think of more ideas. Marie did think of many more, but it is difficult to specifically attribute them to the situation reversal.

External judges' analysis. Neither judge was convinced that the teacher had exhibited evidence of janusian thinking. They noted the teacher's attempt to make the situation more concrete through the role reversal, but did not perceive that the reversed roles were conceived simultaneously. Both judges felt the teacher was consciously aware of her thinking. They felt a new idea had been formed but were unclear about the usefulness of the idea.

Homospatial Elements

Evidence of an empathic homospatial thinking process was suggested by Debby's description of visual images she had of Marie in a classroom like one that the teacher had visited while on vacation in St. Thomas. While listening to the tape-recorded planning session she had with Marie, Debby described the visual images she had as she asked Marie to picture herself in a school in Puerto Rico.

> And at this point I was thinking of a school I had seen, it must have been St. Thomas, and the feeling that I had when I saw this school, "Oh these poor kids." You know, the windows were boarded up because of the heat. It was like a warehouse. And I was picturing myself at that time, I had the feeling of (pause) you know I thought that I might want to teach there. So when I said to her, "picture yourself in your classroom," I was really picturing Marie in this building that I knew was a school.

Debby appeared to bring both herself and Marie together in the same spatial location. She indicated that both she and Marie were in the school she was thinking about. Adding further support for this, Debby expressed her feelings of what it must have been like for the children in that setting; it is as if Debby personally experiences what Marie's schooling was like. The extent of the fusion is unclear, but Debby seemed to have made an empathic connection with Marie as she experienced schooling in Puerto Rico. The following statement provides additional support for this interpretation.

> And then the whole feeling was, "Ah Marie, she won't be able to come up --" (sic) I immediately made a value judgment as to what her schooling was like and that she wouldn't be able to even address the question of "What

if another--?" Because I had pictured her class having very many kids who weren't native Puerto Ricans. So I sort of made a value judgment; in a way dismissed almost a little bit what she was going to say next in my head.

The evidence suggested that Debby had superimposed or fused images of herself and Marie in the school setting she remembered visiting in St. Thomas. She appeared to be consciously aware of bringing the images together as indicated by her ability to describe the setting and her feelings. The usefulness of placing herself and Marie in that setting was that it gave her an enhanced understanding of what Marie might have experienced in a Puerto Rican school. It helped her to construct the reversal example and also to evaluate its potential utility as a means of assisting Marie to come up with more ideas. The interpretation of this example as an empathic homospatial process was made following the final interview with the teacher, so the researcher was not able to obtain her reaction to this analysis.

The researcher's initial interpretation of the example, which the teacher did react to, was that the teacher may have fused or superimposed a visual image of Marie or herself in the Amherst classroom with images of them in St. Thomas. When asked if she perceived images of herself and Marie in Amherst fused with images of them in the other setting, she said:

> No, I think that it was much more here then there. I think it's -- maybe I always try to break up things for people and that's the way that I deal with life. It's like okay, what's the first step, what's the first logical step? I think that I just naturally bring that type of thinking to the classroom. I'm trying to make excuses for why I didn't do it (slaps hands together). Superimposed!

In attempting to account for the teacher's interpretation and examine possible alternative explanations the researcher generated three hypothetical senarios. These three scenarios are presented and discussed below.

Scenario 1

The teacher's thinking occurred in a series of logical and distinct steps such as the following:

1. The teacher saw that Marie did not have any ideas.
2. The teacher then thought "How can I make this more concrete?"
3. She remembered the school she saw on vacation.
4. She thought that I will make this more concrete by putting Marie in a more familiar setting.
5. The teacher mentally placed Marie in that school.
6. The teacher then wondered what if someone came from Massachusetts, what would Marie want to ask that person.
7. The teacher then suggested the reversal to Marie.

The exaggerated steps of this account seem too artificial to reflect what actually went on in light of all of the visual imagery that the teacher described in the initial account. Another possible scenario which may have accounted for the teacher's thought processes is presented in Scenario 2.

Scenario 2

The teacher was looking at Marie and searching for a way to help her think of some things to do with the class. At the same time the teacher is still having some images of her visit to the school in St. Thomas. Suddenly, the teacher fuses an image of Marie and herself in the St. Thomas classroom with an image of Marie and herself in giving a presentation to the class in the Amherst setting. She recognizes that the questions that anyone would ask of an outsider would be the same. All of the above

occurred in one superimposed image where time and space were momentarily transcended. The teacher then described the reversed situation to Marie.

If scenario two were the correct interpretation it would constitute an example of how janusian and homospatial thinking might occur simultaneously. It is unlikely, however, given the teacher's account that this scenario would be the correct one. A third scenario of the teacher's thinking would include elements of the first two.

Scenario 3

1. The teacher was looking at Marie and was having intermittent visual images of her vacation on St. Thomas.
2. The teacher thought "How can I make this more concrete for Marie?"
3. The teacher had an image of the presentation Marie might give, then superimposed that image with the one of the St. Thomas classroom.
4. The teacher thought that Marie would feel more comfortable in her old classroom.
5. The teacher wondered what the situation would be like if the situation were reversed.
6. The teacher imagined Marie asking questions of kids from Massachusetts recognizing that the questions would be the same in each case.
7. The teacher suggested the reversal to Marie.

The researcher's bias would be in favor of a scenario like Scenario 3. Visual images seemed to be interspersed with logical steps in the teacher's thinking. It is hard to account for the teacher's view that her thinking in the situation was entirely sequential and logical as she indicated especially since in other segments of the interview she described her thinking as being highly visual and not necessarily sequential. For example, a few minutes

earlier Marie had mentioned Puerto Rico's beaches and the teacher
indicated that at that point:

> I was in St. John, St. Thomas and I just landed in
> Puerto Rico as she said "beach." I was reliving my
> vacation down there a couple of years ago. I was there.
> I don't even know what she said next, I blanked out, I
> was with my same friends, doing the same things, I just
> relived that entire vacation. I didn't even care what
> she said next. I knew that I would be able to get
> caught up.

She indicated that the thoughts she had took only "...split seconds, I
mean not even, no way could I even say the sentence in the amount of
time that it took..."

Aside from the possibility that the teacher's thinking was as
sequential as she stated, another explanation is that the teacher
wanted to describe her thoughts to the researcher so that they
appeared educationally sound. Yet another explanation is that our
language is inadequate for describing accurately the thought processes
people experience. The linear ordering nature of language may have
biased the teacher's descriptions. In this regard using verbal
accounts to gather evidence of teachres' "not necessarily linear"
imaging, sensing, feeling, and other mental processing, points to a
methodological deficiency of the study. This issue is addressed in
more detail elsewhere in the study.

External judges' analysis. No clear agreement was reached by
the judges about the homospatial aspects of this example. One
reviewer initially felt certain that the teacher had fused images of
the teacher and Marie in the Amherst setting with images of them in

Puerto Rico. The other judge felt that it was not sufficient to imagine the same person or persons in two different settings at once. The judges were unable to determine for certain whether the process was evident. The interpretation of the empathic homospatial process was not discussed with the judges as it was formed after their review therefore, their views about it could not be presented here.

Concluding Remarks

In this example, a creative product was the teacher's idea that Marie imagine herself in a reversed role as a means of making the situation more concrete and therefore, helping her think of more ideas. The idea was new and potentially useful, although its actual utility was undeterminable. If Debby had conceived of the reversed settings simultaneously it could have constituted a janusian thinking process, but the element of simultaneity appeared to be absent, or at least very doubtful.

Evidence of a homospatial process was implied by the teacher's comments which suggested that she had mentally placed Marie and herself in the same classroom. Her description of the setting suggested that she placed herself in Marie's position as a means of experiencing what her education had been like. Through this empathic projection of herself into that situation she was able to imagine what the reversed situation might be like and also to make an estimate of how effective imagining a reversed situation would be for Marie. The degree to which a fusion of discrete entities occurred in this example

was unclear, however, it was concluded that an empathic homospatial-like process did occur.

Example 4: Brick Walls (Alice)

Background Information

Two boys had misinterpreted an assignment. They were supposed to have created an original (imaginary or real) product and then devise a commercial to advertise it. One boy had merely taken the product Coca Cola and was trying to make up a standard advertisement for it. The other boy was going to construct a Trans Am automobile, but had gotten tired of it and didn't want to do any more. The teacher wanted the boys to make an original products, but the boys resisted saying that another teacher who had been working with the boys in the early stages of the assignment had not said that it had to be an original product, and besides they had spent too much time on their projects to change now. Although the teacher was not convinced of the validity of the boys arguments she offered a compromise and said that the one boy could use the Coca Cola idea but must give a new twist to it. The other boy asked if the two boys could work together. She agreed, leaving them and herself some time to think about the situation. After about five minutes she returned and the boys reported that they had invented a robot that would drink and advertise the Coca Cola.

The focus of this example is on how the teacher decided to give the boys some flexibility and time to come up with a new idea. Alice indicated that she was not sure of her solution to the problem when she left them:

> ...as I walked away I was really puzzled because they're, the two of them, are extremely stubborn and I didn't quite know how I was going to approach it. Whether I was going to stand firm and "Well that's the breaks, that's not the assignment and you're going to have to do something else and I will help you with that," or was I going to bend...

The teacher did bend giving some flexibility to the boys, letting them develop their robot idea. Alice's explanation of how she arrived at her solution indicated that janusian and homospatial thinking processes may have been utilized. Evidence of the processes is presented below, and related interview transcripts appear in Appendix F, Example 4.

Janusian Elements

When Alice initially confronted the boys she recognized that they were becoming harder and firmer in their position, and she wondered whether she should get harder and firmer, too, or whether she should bend. At this piont she indicated that:

> ...The prime feeling that I was going through with those guys was "I don't want to put either of us up against the wall. I have seen many adults interacting with those children in that way, and I don't want anybody to lose.

In this statement Alice seemed to say "I will not be a hard brick wall that will come up against these boys, and I don't want them to be a hard brick wall to me." The suggestion that both the boys and the teacher must be flexible at the same time suggested a symmetry characteristic of janusian thinking. In a sense what Alice was saying was that to be hard with the boys would only entrench them further and leave them no options. She wanted to present a flexible posture to the boys which they would reflect back to her.

Alice expressed more directly the idea that there is strength in flexibility in the following excerpt.

> I talk to them...about how both of them stand like a brick wall and sometimes things charge up against them because they are so strong that the things bounce off. But sometimes things come up against them that are very strong and will break them. That's the way that I see those guys interacting, and I see tremendous growth in them as I describe it to them. They are starting to bend a little bit, and they are choosing the time to bend. I talk to them about how th t flexibility is going to let them take advantage of so many more things, and not be that brick wall that locks out and blocks. I talk to them a lot about that. I talk with the kids a lot in pictures that way, because that's the way that I do think.

The contradiction, embodied in the idea that softer things can be stronger than hard things, formed a framework for Alice to assist the boys in being more flexible. Her perception that being strong with the boys would be a weaker strategy than being softer and more flexible was suggestive of a janusian thinking process. Alternatively it could have been argued that Alice had merely recognized physical principles inherent in brittle and flexible objects and that she

perceived no contradictions or opposition. However, Alice later indicated in the final interview that she had been consciously aware of the contradictory nature of the approach she had used and indicated that she felt that this was an example of janusian thinking:

> This is a real live one...that a hard thing could break easily, whereas a weed will not break easily, that's one, I see that, that's very clear for me.... Hard as a brick wall and yet crumble easily.

The effect of the teacher's "soft" approach with the students was a successful interaction with them. The boys came up with a new idea, plus the boys exercised a more flexible approach, something the teacher wanted them to do. This situation could be considered new in that there was a unique set of circumstances for Alice to deal with, although the strategy appeared to be one that she had used before in other situations.

External judges' analysis. Both judges felt that Alice's approach had a positive, useful effect on the boys' behavior and that the situation was somewhat novel to Alice. The judges agreed that the opposing elements of standing firm and bending were present. Simultaneity was in question, and one judge felt it equally possible that the teacher had simply used a compromising technique. The reviewers concluded that there was evidence of janusian thinking but that the possibility of the teacher's use of a compromise approach made it difficult to judge for certain.

Homospatial Elements

The data suggested that the teacher fused or superimposed images of the boys and images of a brick wall. In one instance the teacher described the boys in both words and gestures indicating that they were brick walls, hard and unmoving:

> I think that if I could play that one out it would have looked like, mmm, I think that they were images, and I think it was of -- this is not going to come out very clearly on the tape recorder. (She starts to motion with her hands, folds them in front of her and sits rigidly). Of Simon sitting with his arms folded, his body back in the chair, saying "I'm not doing it." And Don putting his head down with his hat down saying" Uh-Uh, I'm not." They don't budge -- that's it, and I don't like to put them there, and we all feel helpless there. I'm not going to make them do it. You know that I'm not going to punish them for not doing it. They get stuck, and I see it. It's very clear to me, and I talk to them about it. It's very clear to me, and I talk to them about it. It's very visual to me I think.... I talk to them...about how both of them stand like a brick wall....

The teacher's modeling of the boys' body language suggested that the boys had taken on the physical posture of brick walls as well as having become entrenched and unmoving in their thinking. To have actually fused images of the boys and brick walls as has been suggested above in the teacher's description would constitute a homospatial thought.

The teacher's comments in the final interview about the possibility that she superimposed or fused images of the boys and brick walls lended support to the interpretation that she utilized homospatial thinking.

> ...there were times that I really saw them as brick
> walls. As standing as brick walls...it was very clear
> for me seeing them and seeing brick walls, seeing them
> and seeing brick walls.... But the metaphor was so clear
> for me for them that I am assuming that somewhere that
> happened. I can't recreate it, but the image is so
> clear for over the years I could list, you know, five,
> six kids that that is so clear for me for them, that I
> only have to imagine that something close to that
> happened.

Alice's comments leave unclear the precise nature of her thinking

process. She was not entirely certain whether she actually fused the

images or whether she perceived images of the boys and wall in rapid

succession. In the latter case Alice would have seen images of the

boys and then discrete images of the wall and would have made

comparisons between the two. In the former, walls and boys would be

one image. The bulk of the evidence suggested that the images were

fused. The teacher's depiction of the boys as hard and unmoving

objects through both her body language and verbal statements suggested

that the boys and brick walls were one.

Alice appeared to be consciously aware of her bringing together

in the same space boys and the walls. She overtly recognizes that the

metaphor can be a way of making an abstract concept more concrete for

the boys. Her recognition of the boys becoming hard like brick walls

appeared to be a key element in helping her to understand the

situation and to make the subsequent decisions not to be hard and

force herself on them. In this regard her thinking led to a useful

product. The newness of combining images of boys and brick walls is

suspect in that to say someone is like a brick wall has become a

cliché, or a "dead" metaphor. However, Alice did not appear to use the metaphor as if it were a cliché or "dead." She seemed to revivify the metaphor. "Boys-as-brick-walls" was a very real and vivid conceptualization that she used to help her understand the situation as well as to help the boys understand how to create options for themselves. Therefore, her application of the metaphor to the situation with the boys had some new aspects. However, as was pointed out earlier in the discussion for janusian thinking, the teacher had used the metaphor of the boys and the walls on other occasions, so it was not entirely new from this perspective.

External judges' analysis. In their initial analysis of the interview transcripts neither external judge identified "boys-as-brick-walls" as an example of homospatial thinking. However, after a discussion with the researcher there was general agreement that the example had evidence of homospatial thinking. One judge fully supported the researcher's analysis given above; the other was supportive of the analysis yet questioned whether it was sufficient to fuse an image of the boys "in the here and now" with an abstract image of a wall, or whether both images had to be abstractions. The researcher's view was that it was sufficient, but the judge remained skeptical and the question was not fully resolved at the time of the judges' analysis.

Several reasons could account for why the judges did not identify this example as evidence of homospatial thinking. First, the judges were not present at the interview with the teacher in which her

<u>animated</u> description of the boys as walls was given. Second, the language in the transcript was confusing because of the teacher's conversational style and also because the example was excerpted from a longer interview and thus out of context. Third, there were several interesting sets of images in the transcript and the judges focused on other items (see Appendix F, Example 4).* Finally, the judges did not have access to the teacher's final interview transcript in which the teacher expressed support for the analysis presented by the researcher.

   <u>Homospatial elements (continued)</u>. The researcher's analysis of this example after it had been reviewed by the teacher and external judges suggested still another interpretation. In several places the teacher's comments indicated that she may have fused her self image with images of brick walls in an empathic homospatial fashion. When she talked about her perceptions of the situation with the boys, she found it most easy to express her feelings through physical gestures. She modeled the boys' brick-like behavior as if she, too, had experienced those same feelings. She also said that she didn't want to put either of us "up against the wall," indicating that she not only saw the boys as brick walls but also perceived herself as a brick wall or at least experienced the feeling of being a brick wall. Later, in describing the situation she indicated that "They don't

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   *The judges did identify three other instances when they felt homospatial-like thinking processes were exhibited. These examples are discussed separately in the next section and are titled "Waves and classroom energy," "Kim and the pencil," and "Stuck in boxes."

budge -- that's it, and I don't like to put them there. They don't like to be there, and we all feel helpless there." The teacher's statement that "all feel helpless there" suggested that she had also brought herself into the same spatial location and that she experienced the same helplessness as the boys. Additionally, the teacher appeared to be consciously aware of what it felt like to be a brick wall and recognized that that was not what she wanted to have happen to either her or the boys. The effect of this empathic homospatial process would have been an enhanced understanding of the boys' situation and needs. The teacher did appear to have a clear grasp of the situation. While the evidence in this example is inconclusive and was not verified or discussed with the teacher or the two external judges, the interpretation remains plausible and worthy of consideration.

Concluding Remarks

The evidence in these interview excerpts lend support for the interpretation that the teacher employed janusian and homospatial thinking in arriving at her solution of how to interact with the stubborn boys. The teacher's perception that standing firm like a brick wall was a weaker posture than being flexible like a branch or weed was a janusian-like concept. She perceived it as contradictory that the "weaker" weed or branch could actually be stronger by yielding than the unyielding "stronger" brick wall. Working in close concert with the janusian-like processes was the homospatial-like

perception of the boys as brick walls. The teacher's comments also suggested that she also used a homospatial empathic process to fuse herself with an image of a brick wall as a means of knowing what her students were feeling. A likely scenario suggested by the data is the following:

1. The teacher discovered that the boys had done the wrong assignment and brought this to their attention. She saw the boys getting hard, perceived them becoming brick walls.

2. Wanting to become firm at first she recognized that she started to become a brick wall. She recognized that two hard brick walls are about to come up against one another.

3. The teacher recognized that she is stronger by being flexible and bending rather than being firm.

4. The teacher modeled this behavior for the boys by bending and giving them a chance to bend too. By taking cues from her bending, or remembering the teacher's previous discussions about learning to bend, the boys also became more flexible and altered their behavior.

The actual events may not have followed this scenario to the letter, but janusian and homospatial-like elements appeared in the teacher's thought process. While the researcher, external reviewers, and the teacher felt that the teacher's approach produced positive effects, there were reservations about how new or unique the teacher's thinking was.

The results of this instructional episode were relatively ordinary classroom interactions that, from an originality standpoint, only marginally satisfied the criteria for a creative event. Such findings suggested that there are levels of creative production and that janusian and homospatial-like processes may be in operation on

many levels of mental discourse -- from the most mundane, everyday activities to the most profound discoveries in science and the arts.

Example 5: Ian -- Can't Decide What to Write (Alice)

Background Information

This example was taken from an interview that followed a writing lesson that Alice had taught earlier in the day. During the lesson a child, Ian, was upset with the assignment and could not finish writing his story. The teacher indicated that he was an extremely creative and bright child, but that he didn't like imposed writing assignments. "He cries," she said, "a little out of frustration, but more because he doesn't want to do it." As Alice began to help Ian with the writing assignment, she reported having visual and auditory images of herself talking with her husband about decisions that he had been thinking about making. The images suggested evidence of janusian and homospatial processes. See Appendix F, Example 5 for the related interview transcript.

Janusian elements

The researcher identified no clear evidence of janusian thinking in this example, although some suggestion of the process came from Alice's explanation of her approach with Ian. In the situation Ian was crying and told the teacher that he didn't know what to write.

Alice said that she made statements like, "I know you don't know. That's what you decide!" "Decide. It's not -- there is no right answer: Decide." "But 'don't know' means that there's an answer -- not really a right answer. You just have to decide to decide."

Although deciding and not deciding at the same time could be construed as a janusian conceptualization, Alice did not appear to use the idea in this sense. She seemed to be really saying that Ian shouldn't take the decision so seriously, but just decide and write something. The writing was the important thing, the decision about what to write about in this case was not.

In another instance, later in the interview, Alice seemed to fantasize that Ian made a decision when he had not done so in reality. She explained:

> ...I know when I heard and I saw him give me an answer -- his mouth decided. He didn't. But that was what I was -- I was so anticipating it -- I don't think that I heard a specific word, but he said something and I said "There you go! Now. Okay, you --." And he didn't. Until the end when he said, "It was a ticket to Disneyland" or "Disney World," or whatever. But by then, it was -- I had heard him say an answer a lot of times. There were probably three times I heard him -- I said, "Of what?" "No, no, no" -- And I heard him say, "It was a bike." But I didn't hear him say that....

This was not considered as evidence of janusian thinking although opposites of deciding and not deciding were present. This was perceived not to be an example because Alice was consciously aware that his "answers" were imaginary and that he was not simultaneously perceived to be actually deciding and not deciding.

External judges' analysis. One judge felt that the teacher's
use of the idea that Ian could decide and yet not decide was evidence
of janusian thinking. The second judge initially felt that there was
no evidence of the process, but indicated by the end of the discussion
that the teacher possibly used the process. During the review session
the researcher also concurred with this possibility, however in
reexamining the evidence concluded, for the reasons given above, that
janusian processes were not employed.

Homospatial elements

While the teacher was trying to get Ian to decide what things
might come next in the story, she found that images from an
interaction with her husband came to her mind:

> [Ian] said, "I just don't know; I just don't know what
> comes next. I just don't know." I heard myself saying
> to [my husband], "I know you don't know. That's what
> you decided!" (laughs) "Decide. It's not -- there is
> no right answer! Decide." And I could hear -- [my
> husband] and I have had that conversation...about jobs
> that he wanted to take or didn't want to take. He said,
> "I just don't know." And I'd say, "Yeah, I know, but
> don't know means that ther's an answer -- not really a
> right answer. You just have to decide to decide." And
> I know that it was my husband -- but I was talking to
> Ian. So that was very, very clear. Very, very clear.
> It's the same answer that [my husband] would have: "But
> I don't know." (laughs)

The teacher indicated that she decided that this approach to tell Ian
to decide would not work and that she should try something else.

> But that was a conversation from [my husband] and then
> that's when I decided to drop those words... it wasn't
> helping him [my husband]. And so that's when I sort of
> gave [Ian] some possibilities to choose from.

Ian's use of the words "I don't know" appeared to have stimulated the teacher's recall of discussions she had had with her husband. The teacher seemed surprised that suddenly her conversation with Ian had turned into a mental discussion with her husband. It appeared evident from the teacher's description that the two different discussions became one for at least a brief period of time. The similarity in the words of the two discussions acted as a bond fusing them. The combination of the two discussions seemed to constitute a homospatial process.

Other stimuli were present which might have accounted for a fusing of the elements of the two discussions. The researcher believed that there may have been a similarity between Ian and the teacher's husband in manner or appearance and that this similarity could have contributed to a superimposition of the two discussions. In the final interview Alice was asked if she had been looking at Ian and was seeing an image of her husband at the same time. She responded:

> I think it was more a case of, I've heard myself say these words before. I don't even think I was back in that situation of saying it but it was, I, this is, this is a very familiar phrase to me. Umm, I don't think I looked at the child and saw my husband and I don't even think that I went to that situa -- I don't think that I juxtaposed both of those situations. I don't think so.

The teacher's analysis of the setting did not appear to be consistent with her statements on the day of the lesson, as she said "And I know that it was my husband that I was seeing -- he and I. I heard us and

it was my husband -- but I was talking to Ian. So that was very, very clear." The teacher's belief that she did not actually fuse or even juxtapose images in this instance, can be explained in several ways. First, the superimposition or juxtaposition of the images did not occur. Second, the teacher may have misunderstood the question -- she may have been confused and thought the researcher was talking about janusian thinking as she used the term "juxtaposition." Third, it was late in the day and the teacher seemed anxious to get to another apppointment and did not want to get into a long conversation. Fourth, the final interview took place about six months after the interview which was under discussion and her memory of the interview was incomplete. Fifth, the teacher felt uneasy or embarrassed about sharing aspects of her thinking.

Alice indicated that although she felt that she did not fuse visual images of her husband and Ian, she may have fused the sounds of the words. She indicated that the words were very familiar to her and that these could have been fused.

The product of the teacher's thinking was Alice's recognition that the approach that she was using with Ian would not work -- it had not been helpful to her husband either. The product of her conceptualization was a change in process, she dropped one line of questioning and began to use prompts of another kind. The teacher's decision was useful to the extent that it helped her to recognize that her initial approach probably would not be successful and that she needed a more effective technique. The realization that Alice used

the same approach with her husband and with Ian, was a <u>new</u> realization.

   <u>External judges' analysis</u>. Both judges were in close agreement that the teacher had fused the voice and visual image of Ian with that of her husband. The judges further indicated that they felt the teacher was consciously aware of her fusion of separate images, and that this recognition led to a new and more useful approach to use with Ian. Both judges expressed surprise that the teacher believed that she had not fused images of Ian and her husband.

Concluding Remarks

   No clear evidence of janusian thinking was identified in this example. However, there was evidence that the teacher had fused auditory and possibly visual images of an interaction with a student and a discussion with her husband. The product of the conceptualization was the realization that her approach with the student would not work. In other words the product or effect of her realization was to stop using an ineffective approach. While the fusion of <u>visual</u> images was placed in doubt by the teacher's analysis, it was concluded that a homospatial fusion of two separate discussions occurred, perhaps involving only <u>auditory</u> stimuli.

<u>Example 6: Coffee Cup Classroom (Alice)</u>

<u>Background information</u>

This example comes from a planning interview in which Alice described some of the general feelings that she had about her teaching. The example differs from the preceeding examples in that it focuses on the teacher's perceptions about her general comfort level in her classroom rather than on the solution to any specific problem or plan for a lesson. Alice indicated that she had come to feel calm and confident in the classroom because she had "lots of tricks" and had an endless set of possible things that she could do with her class. Alice said that she tried to keep from getting stuck in boxes where she wouldn't have any choices about where she could move. In the following excerpt the teacher described how she used the coffee cup to illustrate the freedom she felt in the classroom. Alice recounts a discussion she had with the school principal earlier in the year (see Appendix F, Example 6 for related interview transcripts):

> T: The principal and I were talking about how I feel about teaching this year, and this and that. And I was sitting at his desk and I was talking about my coffee cup. And I said, "I used to look at teaching sort of like this." (Note: The teacher picked up her coffee cup which was on the desk and began to move it around to illustrate what she had talked about to the principal.) And I held the cup very close to me so I could say, "Yeah, things are fine; well, there's this problem --" but it's very, very close to me. And so everything was very -- I was feeling very sensitive about things and I couldn't get enough perspective.... Instead of feeling like now, I could put it here and move it away from me. Still it's a part of me, but I move it away from me and look at it from all different angles.

R: What is the coffee cup?

T: The coffee cup is everything that is going on -- the kids, situations, pressures -- and I used to keep them very, very close and deal with them, very, very close. So there was very little room for me. But as I could look at it, I could look at it from this perspective, turn it around and decide I don't want to deal with it at all. But I feel like I have lots of choices and I want to give the kids that. And that's what the whole thing about freedom is to me, is having lots of things I could do. And so, I feel very relaxed about teaching now, because if this doesn't work, something else will....

Janusian elements

There was evidence of janusian thinking in this example stemming from Alice's descriptions of her ability to be distant but still be near to her class. This near/distant relationship was expressed by the teacher in several different yet related ideas. Above she stated that she wanted to be able to move it away from her but still have it be a part of her. Also she stated that the farther she could move it away from her the better perspective she could have on it. In the final interview she pointed out that this had nothing to do with a vision problem:

> I think...it probably is janusian in thinking,...the notion of something being close yet unclear. Yet, when it's further away, I can get a clear picture of it. Which one might not usually -- one needs, something needs to be close-up to be able to see it clearly. And the further it is away, the harder it is to make out. I get more perspective on it when it's furhter away than when it's close-up. And that has nothing to do with a vision problem...it's not what one usually thinks of. And I do feel that way. I feel that very often, that I keep the situation too close to me. I can't get enough, ah, vision on it and a large enough perspective on it.

A contradiction perceived here was that one's vision of things improved as the distance increased. For the researcher who is nearsighted, this is an apt contradiction, but for a farsighted person this would seem more logical. It is also logical for one to step back from something to get a better view of the whole object. Eschewing the exceptions, Alice seemed focused on the contradictory aspect of not being able to see clearly something which was very close to herself. This appeared to be related to the need to distance herself from her class and still be close.

Alice also described a kind of oppositional tension between being attached to the classroom yet maintaining a certain detachment from it. She stated that she could "move it away from me" as if it were detached and view" it from all different angles." However, she says, "Still it's a part of me..." Being attached to the classroom but at the same time being separated from it to get a perspective of the classroom is a concept which Alice supported again in the final interview.

> ...I want to be able to keep my situation as close to me
> as possible so that I can, that I am in it yet as far as
> possible that I can see it, and I think too, to many
> teachers it sounds like you can't have it both ways.
> But I think indeed that you can and for me I must.

Alice's statement that she could have things both ways suggested that she conceived of the opposites as operating side-by-side simultaneously.

In this example multiple elements of opposition were present. There was a close-distant element and an attached-separated element. These were linked to what Alice perceived was contradictory -- that something could be very close and yet not be viewed clearly. All of these elements appeared to be interrelated and impossible to clearly differentiate. Alice was consciously aware that it was not a matter of choosing between being close or distant or attached or separated from her class. She realized that she needed a "detached attachment" in which she was near and far enough away from her class to feel comfortable and effective as a teacher.

At the time of the interview with Alice her ideas of the near and distant classroom were not new to her. She indicated that this was a perspective which had gradually emerged over many years of teaching and which she had just begun to fully appreciate in the past year. In this respect it was a relatively new realization that she had come to. The concept was one that she attributed much significance to and felt this to be one of the "basic" things she had come to learn about teaching. Her feeling of comfort that she derived from this realization provided evidence of a useful product.

External judges' analysis. One judge felt that the close and distant perspectives of teaching provide strong evidence of janusian thinking, and supported the interpretation presented above. This judge was uncertain whether the teacher simultaneously or sequentially perceived the various perspectives of the classroom, however the judge felt that there was sufficient evidence to suggest simultaneity.

The second judge perceived no evidence of janusian thinking in the initial review of the transcripts; however, upon hearing the interpretation of the other judge agreed with the evidence supporting the view that janusian thinking was present. The judge accounted for not identifying the elements independently, saying that the transcript was confusing and gave up trying to make sense of it.

Homospatial Elements

Alice's description of the coffee cup as her classroom and all of the activities in the room could have indicated that a homospatial conceptualization took place. However, the coffee cup was merely a symbol for the classroom. Alice did not appear to fuse or superimpose elements of the classroom and the coffee cup. Instead of using the cup, which just happened to be handy, the teacher could have used any solid object at hand to represent the classroom and all of its activities. A pencil, globe, or book would have suited the teacher's purposes equally well. This example would have suggested homospatial thinking if Alice had combined properties of the cup with the classroom. Say for example, if she had said that the handle of the cup was the curriculum material that she worked with, and the bowl of the cup was the physical setting of the classroom, and the coffee in the cup was the flow of classroom activities, etc. Because this

fusion of the properties of the classroom and the cup did not appear evident, this was not perceived to be indicative of a homospatial thinking process.

Other elements of this example did appear to fuse. Alice's physical distancing of the cup (it could have been anything else) appeared to have been fused with her need to be psychologically separated, yet still close to her classroom. The physical act of Alice holding her cup near and holding it away from her embodied the feelings she had about her teaching. Holding the cup at arms length she could have many more different perspectives of it. It was something she could hold in her hand and yet still recognize that it was separate from herself. In short, what appeared to be fused were the physical/visual sensations of holding something at arm's length and the teacher's psychological sense of being separated and attached to her classroom.

The criterion of conscious awareness was satisfied in that Alice recognized that as she was talking about the distance between her and her coffee cup, she was actually talking about the distance between herself and her class. The same aspects of usefulness and newness as were described for the janusian aspect of this lesson apply here. Both janusian and homospatial processes appeared to function in close combination.

External judges' analysis. One of the judges indicated that the teacher may have fused images of the children with images of taking different perspectives of the coffee cup, although, clear evidence of

this was not perceived. The other judge did not independently identify the aspect of distance and the coffee cup as showing evidence of homospatial thinking. The researcher's analysis which was presented above was discussed with the two judges and they indicated that they felt it was a plausible interpretation which had gone unrecognized by them. One of the reviewers did identify two other potential examples of homospatial thinking which are discussed later in this chapter under the headings of "Stuck in Boxes," and "Waves and Classroom Energy."

Concluding Remarks

This example differed from the previous examples in that it was based entirely on the teacher's reflections on a new way she had begun to look at her teaching over the past year. This new perspective helped her to feel more comfortable in her teaching and to give her new options of how to work with students. Multiple opposing feelings of wanting to be attached but separate, and close yet distant, suggested the presence of janusian thinking. This conclusion was further supported by the teacher's stated belief that she could keep the class situation close to her and also have it as far from her as possible, which implied she could have both simutlaneously.

Although the external reviewers did not independently identify the same homospatial elements perceived by the researcher, there was agreement that it was possible that the teacher may have fused visual/ physical sensations of distancing the coffee cup with the

psychological distancing the teacher needed to have from her classroom. Both the janusian and homospatial-like processes which were noted appeared to operate in conjunction with each other.

Other Selected Examples

The examples in this section suggested evidence of janusian and homospatial thinking, however, this evidence was not as compelling or clear as in the preceding six examples. The lack of clarity stemmed, in part, from the flow of the interviews and time constraints of the interviews which precluded exploration of the teachers' thoughts to the extent which was warranted. The examples which follow help to illustrate the wealth of imagery and contrasting elements which were observed in the study. For ease of presentation, the exmaples have been loosely grouped into three categories, those relating to: (1) classroom management, (2) instructional implementation, and (3) lesson content.

Janusian and Homospatial Thinking in Classroom Management

The teachers in the study reported using imagery in making plans for learning activities. One use of imagery was to predict in advance how students would behave during a lesson or how involved they would become. A second use of imagery was to discuss images or metaphors

with the children as a means of helping them to monitor and control their own behavior. Examples of both of these uses of imagery are discussed below. Aspects suggesting janusian and/or homospatial thinking are noted. In the first example, Alice and Jessie explain similar approaches they used to predict student involvement.

<u>Predicting student involvement.</u> In separate interviews, both Alice and Jessie indicated that while planning for lessons they would imagine students behaving as they wanted them to, and at the same time would have images of children doing just the opposite. Alice described an instance of this kind of thinking about a story she was planning to read to her class. In the following transcript, "A" stands for Alice, "R" for researcher.

A: I think that I was seeing mostly fairy tales. And I felt really locked in. So I kept flashing back to the story, and I was -- "picture with excitement -- need to grab the kids -- picture of...and showing involvement" (teacher reading her journal entry). Okay, at this point, what I was doing was -- I was realizing that I wasn't excited by the story. It was just sort of pat and coming. And I could see the kids -- I could -- I could switch between the kids being really involved and even -- particularly with their body language, what I was seeing was an "into it." I was seeing them showing me signs that they were interested in participating; people lying down; people sort of moaning and groaning through it. And that's not what I wanted.

(later in the interview)

I was picturing what I wanted to see which was involvement, and that looked like -- it wasn't necessarily what they were saying; it was an attitude showing through their body language. And what the other story was giving me was a picture of non-involvement. But I was really focusing on the picture of involvement; how are you going to get them; how am I going to get something that they're going to be into?

R: When you were seeing children involved and not involved, were those coming as seeing them involved and then not involved?

A: No. Really seeing them involved. I don't think that I saw them not involved, but I knew that story wouldn't get them involved. I mean, I pictured -- I think I pictured the story -- telling -- saying the story and not picturing the response that I wanted. I can't now picture...I pictured the story -- no, I pictured them involved but that didn't come from (laugh) the story!

R: Ah! They were involved in something else. Living and like that (laugh)?

A: Yeah, but the story wasn't the cause of it. Okay. So then I switched. And I had to make it more personal....

The excerpt shown above indicates that the teacher was seeing images of what she wanted and images of what she didn't want. In one sense she seemed to be holding an image of what she wanted to see the children do in her mind and then either successively or simultaneously picturing the kind of involvement the story would produce. In one instance she said she "switched" between the images, indicating more of a sequential consideration. Elsewhere she said she was focusing on the picture of involvement, but the story was giving a picture of non-involvement which suggested both were going on at the same time. In still another place she indicated that she didn't see them not involved. Such inconsistencies indicated that the teacher was not very sure about the exact nature of her thinking and/or perhaps our language is not an entirely adequate tool for describing thought processes. If images of the two opposite behaviors were juxtaposed, then this might qualify as a janusian conceptualization. However, another aspect of janusian thinking is that the opposites remain true

and equally operative. In this situation it seemed that one or the other of the opposing images overpowered the other, suggesting that they were not perceived to be equally true. This last aspect argued against interpreting this as an example of janusian thinking, but the presence of the opposing elements being perceived close together suggested that this was still a possibility.

Jessie described a similar thought process. Near the end of a planning interview she described some concerns that she had about doing the "apple core activity." In the excerpts below, Jessie (J) described her concern for the childrens' ability to control themselves.

J: I'm just not sure that this particular class has the control not to get so carried away with it that it would be unbearable.

R: What does that unbearable part look like, do you have a vision of this?

J: Their level of excitement, this may not be the class to do it with, that they may get too hyper about it and lose the essence of it just by being unable to manage themselves and so I'm questionning whether to put them in a position where they will not be able to manage themselves....

The "final interview" shed new light on these passages for the researcher as the teacher relayed the following interpretation:

> ...it seems to me that at the time when I was thinking about that too I was visualizing two things happening at the same time. One was sort of a running commentary of how this might get out of hand and simultaneously how it could be maintained so that it wouldn't. And those two things were going on at the same time. I mean that I was visually seeing the kids going wild and the room filling up but at the same time how could I structure it so that it wouldn't.... Now exactly how that happens, whether it's a back and forth kind of a well this would happen and then this or that would happen, but my sense of it after it's over; it's that they were unwinding at the same time.

Jessie reported that she had had similar experiences at other times as well and described a recent image she had:

> I was seeing, at the same time, the kids going through the halls singing and enjoying it and a really positive (sic) -- the opposite of that was what could have happened is a chaos of kids really getting out of control; and there again I was seeing both aspects of it, and not seeing one and then the other, somehow at the same time and I'm not sure how that happens.

Jessie appeared to conceive of opposing images of desirable and undesirable student behavior in a janusian manner. Although, like the accounts of Alice there was no evidence that the opposing elements were conceived of as being equally true and operative at the same time. Jessie's comments are much clearer and more consistent than Alice's, but this was probably due to the fact that Jessie gave her account of this process during the final interview after she had been informed about the theory of janusian thinking.

It was concluded that neither of these accounts provided convincing evidence of janusian thinking despite the appearance that opposites were conceived of as operating simultaneously or in rapid succession. The researcher's belief that the opposites were not held as being equally operative at the same time argued strongly against interpreting these descriptions as janusian thinking processes.

Waves and classroom energy. This example and the two following examples came from interviews with Alice. She explained that she frequently used images and metaphors with students in her class to help them become aware of their own behavior and to find more

appropriate ways of behaving. In this first example, she explained
how she used images of "waves" with the class.

> When there is a lot of energy in the room that's very
> negative verbally and I just see it, and I could touch
> it and I talk with interns about it. You've got to be
> able to start feeling it before it's too late. Before
> someone's really in trouble. I could walk into a room
> to see it in terms of the room design, I could see what
> papers are on the floor, I could see -- watching the
> kids' movements how large they are, and how small they
> are, the tone of the voices and I could sense that there
> are kids that are in trouble that are losing it and it's
> the job of an adult to get some control of what's
> happening. And I talk to them about it and sounding
> like waves crashing and how one wave crashes into
> another and it gets larger and soon, and they see it --
> they see it, we talk about it and we talk about the
> difference walking into a place where we're feeling
> calm waves that are still moving but are very calm, and
> they don't smack into each other, but when a wave smacks
> into a rock, the effect that that has -- so we talk a
> lot about that in terms of pictures. I think about
> those things, I could see those things very clearly that
> way, I could see a kid drowning, I could feel it and
> it's not really in terms of thoughts.

Several points are worthy of note in this excerpt. First, Alice
seemed to see the mood or energy of the class as if it were waves.
She "feels," "sees," and "senses" the energy, and the students' small
and large movements appear the same as the calm and crashing waters.
Even though she was speaking retrospectively, her vivid descriptions
gave the researcher the impression that she fused images of the waves
with images of classroom energy. Statements like "I could see a kid
drowning, I could feel it..." suggested more than seeing the waves as
analogous to the energy; they appeared to be one. The waters got
muddied (pun intended) however, in that she also spoke of the energy

sounding "<u>like</u> waves crashing," as if this were an analogical process. Both may have occurred, there was insufficient evidence for drawing firm conclusions.

Secondly, the teacher consciously had the children imagine the classroom energy as waves and she indicated that they could actually see it. She felt that this was a useful technique for helping students to monitor and understand their own behavior. Actually having the class feel and become the waves would encourage them to use a homospatial process, it might even require it.

Finally, Alice spoke of the waters in terms of "calm" and "crashing" properties. Her awareness that the waters and the class had the potential of being both calm or crashing hinted at a janusian process, although the element of simultaniety appeared to be absent. It was concluded that although elements of the two processes were suggested, their presence could not be confirmed due to insufficient and conflicting data.

<u>Kim and the pencil.</u> Alice described how she talked to the students about the effect their teasing had on a particular student. She equated Kim's ability to cope with teasing to the ability of a pencil to bend.

> I talked to them about someone -- they're just pushing, pushing, pushing, pushing -- I show it to them with a pencil and I show them the pencil breaking when it's too much for Kim to take, because she just can't take any more, they've pushed too hard...and I can watch it in their faces, some of them know exactly what I'm talking about, and some of them have no idea at all, cause they just don't organize information that way.

The image of the pencil breaking was one that she had had in the past, and when asked if she could remember whether she had fused an image of Kim and the pencil Alice could not recall her thoughts at the time. Her statement that "I show them the pencil breaking when it's too much for Kim to take..." hinted that the two were one, but this could easily have been an idea which was formed through a stepwise analogical process. There was insufficient evidence to judge. What is most significant about this example, is that Alice's equating Kim's inability to "take" the teasing with the pencil breaking appeared to be a strategy that would encourage students to use or require them to use a homospatial process.

Stuck in boxes. Homospatial-like superimpositions were suggested by Alice's descriptions of how students feel when they have no choices and of how the students "box" themselves in. She specifically referred to some grey boxes that were along one wall of the room and described how one boy limited his own choices.

> When somebody does something to him, he doesn't have choices in the way to react. He has to (teacher slaps hands together) because he doesn't know what else to do. And that's what I was reflecting back to him. "You're stuck." And I said -- "you're out in the hall -- wall (sic) which is all grey boxes like this...." And I said, "What happens is all of us, all of these things, these are all the possibilities that you have. What happens to you is -- what looks like happens to you is you get stuck in this box. And when something happens you've only one way to react because this is the only choice you have. You can't -- you don't look at this situation and say, 'Well I could talk to this child. I could hit this child. I could scream at this child. I could go to the teacher. I could walk away.' You're seeing

yourself stuck. You're on empty.... This is...the only
room you have to move." So I guess I see it more, I feel
it more, like a boxed in; instead of sort of endless --
I could do this, I could do that....

It was inferred from these pasages that Alice may have fused an
image of the boy who was stuck with images or sensations of being
"boxed-in." The teacher's remark that "what happens to all of us" in
putting ourselves in boxes, lended an empathic quality to her
description. She had placed herself in a box too and knew what that
feeling was like. Alice's comments opened to speculation that she
had homospatially fused images of the boy and his "stuck" situation
with images of being boxed-in, and or in an empathic homospatial
process fused herself in the boy's boxed-in situation. Alternatively,
this example may have occurred to Alice as an analogical process in
which the two situations were likened to each other but never really
fused in her mind. As with the two previous examples there was too
little evidence to do more than make such speculations.

Hints of janusian thinking also appeared in this example. She
explained that she was "reflecting back to him" what his behavior was
like. This suggested that she made a mirror image-like reversal which
is a characteristic of janusian thinking. Moreover, the boy saw only
one way of behaving while she perceived many different possibilities.
He could "talk," "hit," "scream," "walk away," or "go to the teacher."
Alice recognized that the boy had many possibilities, some of which
were clearly opposing alternatives -- some aggressive and some non-
aggressive. However, it was not possible to discern whether Alice

actually conceived of these opposite behaviors simultaneously or
sequentially.

In summary, these three sets of images from the interviews with
Alice illustrated how imagery could be used with students to help them
understand and control their own behavior. Having students imagine
themselves as other entities appeared to be a means by which
homospatial thinking could be encouraged. Alice showed some evidence
that she may have utilized homospatial and janusian thinking,
although the researcher could not be certain that these processes were
necessarily involved in the production of the ideas.

Janusian and Homospatial Thinking
in Instructional Implementation

At times, the interviews with the teachers shifted to their
general ideas about their planning for instruction. Some of the
issues which were discussed were the amount of flexibility the
teachers felt they had to change their approaches, how much direction
to give students, and the amount of power and control teachers and
students should have respectively. The ways that the teachers
addressed these issues implied that they had been able to combine
opposing perspectives. The three following examples illustrate how
this was done.

Structured spontaneity. All of the teachers talked of the need
to be flexible. All wanted structure to work from and yet wanted to
be spontaneous. Alice spoke most clearly on this point:

> There are parts of my day that need to be very
> structured, very, very structured, because I have so
> many things going on at the same time and I need to feel
> real control. So what someone may look at as a million
> things going on -- everybody's doing their own thing --
> the kids and I have a very clear sense of what's going
> on. That's very important to me. But within that I
> feel very spontaneous. But it's because of the control
> that allows me to feel that spontaneity.

As an example of what she could do she said:

> I could sit down to do long vowels with a spelling
> group...and right there I sit with (magic markers and an
> easel), and a story comes out that maybe I'll continue
> using for the next three years. I sort of look at their
> faces and it happens.

Alice's comments showed that structure did not keep her from being

spontaneous, it made it possible. All three of the teachers described

this same concept. They felt that too much structure limited their

spontaneity. Too little structure, on the other hand, would cause the

teachers to lose control and their ability to be spontaneous. It

became clear to the researcher that the teachers were all talking

about a kind of structured flexibility or structured spontaneity, and

not structure alone, that enabled them to move away from fixed

curriculum approaches. Now the question that emerged in the analysis

was, did this constitute janusian thinking? It would not if a

teacher's first thought was "I need more structure, and then I can

move to more flexible behavior later." On the other hand, if a teacher

conceived of being structured and spontaneous simultaneously then this

might qualify as a janusian conceptualization. Both interpretations

appeared to be possible but neither interpretation could be clearly

supported by the evidence.

Teaching by not teaching. All of the teachers in the study
indicated by various words and actions that students could learn best
in certain situations without intervention by the teacher. In the
final interviews the researcher proposed to the teachers that they
were "teaching by not teaching" in these instances, however, the
teachers did not feel comfortable with this phrase. They seemed to
feel that the phrse "teaching by not teaching" in some way reflected
badly on their teaching or else just didn't adequately describe the
reality of the situation. Despite the teachers' reservations the
researcher maintains the view that the teachers utilized such a
principle in various forms. The difficulty with the phrase probably
centered around the meaning of the word "teach." The researcher used
the word in its traditional sense of giving information to the
learners. Whereas the teachers thought of the term in its broader
sense of getting students to think and learn. This sense of the word
is reflected in the following excerpt taken from an interview with
Alice.

Three boys were trying to develop an advertisment for a product,
but couldn't decide what to do. She talked about how she deliberately
restrained from giving them leads.

> There was something that was recurring during that half
> an hour that kept going through my mind, which was "Ah I
> know what would be great to do for this product," and as
> they would be describing to me, getting flashes of you
> could have somebody jump out of it or doing it with
> puppets...and finding myself restraining myself and
> refraining from giving them those kind of leads which
> most of them would have picked right up on, but not

> wanting it to go that direction, and instead asking them
> clarifying question... my initial instinct was to get
> right down on the floor with them and say, "What about
> this, if we have this over here?" and not wanting to do
> that. And that was definite for each of the groups that
> I was working with.

Alice realized that for her to give the answers or hint at what the answers might be would not get the kids to do the thinking. Using the more traditional sense of the word "teach," she was teaching by not teaching.

The researcher's conclusions were that the teachers were probably not consciously using a "teaching by not teaching" principle but may have just been applying a common inquiry teaching strategy where problems are somewhat open-ended or answers are withheld so that students can think about or investigate an activity on their own. Simple application of a strategy of teaching by not teaching would not be an example of janusian thinking, even though a contradictory notion may be embedded in the approach. For each of the teachers in this study the idea had probably become an instructional cliché and required no janusian thinking. However, it is conceivable that a teacher could actively think about teaching by not teaching simultaneously, and apply this to a teaching situation in such a way that it would constitute janusian thinking.

Teacher as student. At times during each of the observations of the teachers' classrooms the teachers appeared to take on roles normally associated with students, such as asking questions, listening to others give information, etc. From time to time the students would

take charge and lead certain activities. In Debby's class for example, it was made possible for Marie and her mother to take the class over for an hour period. During that hour class, Debby physically stepped back, sat with the students on the floor, asked questions, and listened to the information. Debby was not entirely student, however; she helped Marie out of a few predicaments and in these instances she took on the role of the teacher. During the course of the lesson she variously took on the roles of student and teacher as the situation warranted. Role reversals did not in themselves indicate janusian thinking, but at times Debby simultaneously seemed to be playing both roles, learner and instructor. Similar observations were made of the other two teachers.

Janusian Thinking in Selecting Lesson Content

Several examples have already been presented which indicate that janusian or janusian-like processes were employed by teachers to select lesson content. "Giants and midgets" was presented as an example in which the lesson content appeared to emanate from a janusian thinking process. In addition to using janusian thinking there were two instances in the study where the teachers drew ideas from commercially prepared materials which embodied contradictory or paradoxical elements. The apple core activity was one example of this. In a second instance Alice planned a lesson about "density" using a fable from the Holt Data Bank series call the "Orseck Fable." The fable was about a man and his wife who wanted to have more space

in their home, but could not afford it. They were advised by a Sufi to invite some relative to stay with them, and so they went home and did so. The house seemed more crowded than ever and they went back to the Sufi who suggested inviting more relatives. The man and his wife did so, but they were soon in despair about the crowded conditions because they had less space. They went to the Sufi one last time with their plight and he said, "Send all the relatives away." They did and when the relatives left they discovered that their old house seemed to have more space than they needed. Embodied in the story is the contradiction that you could have more space without having more space.

What seemed significant about the teachers' selection of activities was that they appeared to select activities which were ironical or had some kind of contradiction in them. The surprising nature of these concepts were probably perceived by the teachers to be activities which would capture and hold students' attention.

General Findings about Janusian and Homospatial Thinking

In this section, general findings about the processes of janusian and homospatial thinking are presented. The relationship between these processes and the teachers' creative curriculum planning and implementation of instruction are discussed in terms of the specific criteria for determining the presence of the processes. As was described earlier, several examples were interpreted as conceivably satisfying all of the criteria, however, none of the

examples convincingly satisfied them all. The ambiguous nature of the data led the researcher to describe certain examples as "janusian-like" or "homospatial-like." There seemed to be degrees or levels of the processes in that there were varying amounts of simultaneity, fusion, consciousness, and opposition in the teachers' thought processes. Additionally, there were varying amounts of newness and usefulness in the products and the effects of the teachers' instructional activities. The elements of janusian and homospatial thinking observed in the study are discussed below, along with a description of the difficulties experienced in identifying the thought processes.

Janusian Thinking

The four criteria for identifying janusian thinking in this study were: 1) opposites, antitheses, etc. were in evidence; 2) the opposing elements were simultaneously juxtaposed; 3) a new and useful product or effect was developed; and 4) the teacher was consciously aware of the thought process. Findings for each of these criteria are discussed below.

Criterion number 1: There was evidence of opposition, antithesis, paradox, contradiction or reversal. Numerous elements of opposition, antithesis, contradiction and reversal appeared in the course of the study. A detailed description of specific examples has been presented earlier in this chapter. Opposing elements were of

three types: 1) opposing/antithetical elements; 2) contradictory conceptualizations; and 3) reversed imagery. A summary listing of the observed elements is shown below.

Opposing/ antithetical elements

Large . . . . Small
Clean . . . . Dirty (littered)
Inside . . . . Outside
Limited . . . . Unlimited
Abstract . . . . Concrete
Calm . . . . Crashing
Positive . . . . Negative
Ideal scene . . . . . . Bad scene
Successful . . . . . . Unsuccessful
Deciding . . . . Not deciding
Near . . . . Distant
Attached . . . . Separate

. . . .

* Whole . . . . Part
* Simple . . . . Complex
* General . . . . Specific
* Narrow . . . . Broad
* Feeding in . . . . . Growing out
* Most capable . . . . Least capable
* Pleased . . . . Not pleased

Contradictory conceptualizations

Flexible things are stronger than hard things.

Being very close to the classroom leads to a very unclear view of the classroom; the classroom can be seen better from a distance.

Greater structure leads to more teacher spontaneity and flexibility.

"Teaching" occurs by "not teaching."

Teachers <u>and</u> students can both have power to make decisions about instruction.

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* These opposing elements were evident in the interviews with the teachers but were not discussed as specific examples since no evidence of simultaneity was present.

Reversals

Teacher reversed Marie from Amherst classroom situation to "Puerto Rican" school situation.

Teacher reflected child's behavior back to him.

Teacher reversed role with student.

In addition to the three general forms of opposition illustrated above, it was observed that opposition varied in degree, and also the sensory mode through which it was experienced. First, degree of opposition was frequently vague due to the relativistic meaning of terms. For instance, to say that something can be near yet far implies opposition, but may have no logically intended opposition if it was meant that something was near by car, but far by foot. Another example comes in the giants and midgets example; the giants and midgets were seen as embodying extremes in size, large and small. However these are not absolute differences in size only relatively different.

Most of the contradictions observed in the study were not necessarily contradictory -- to repeat an old cliché, it all depends on how you look at it. To see a contradiction in the idea of "teaching by not teaching" one is required to have a certain meaning attached to the term "teach." Moreover, to say that a branch is stronger than a brick wall sounds inconsistent with conventional logic, yet contexts can be constructed to prove this correct. A tree branch could be bent by a bulldozer and then spring back into place unharmed, while the same motion by the bulldozer could shatter a brick

wall. The point being that contradictions are related to particular contexts, when viewed from other perspectives (a wider context, or superior logic) contradictions fade or completely disappear.

Reversals were also a matter of degree. For instance a teacher might take the role of student in various respects. She might let a student lead the class for a few minutes and take the part of a learner, have students plan and implement a series of lessons on a topic she has no knowledge of, or just sit in a student's seat and have a casual discussion with other students about a television show. Many varying degrees of shifting roles are possible.

In summary, it was found that due to relativistic meanings of terms, varying perspectives, differences in contexts, and varying levels of reversal, assessment of opposition was complicated, and had to be considered more in terms of degree than in absolutes.

Finally, it is noteworthy that opposition was apparent in the teachers' various sensory modalities. The image of the juxtaposed giant and midget was a powerful visual representation of opposing elements in size. Tactile juxtaposition were suggested in Alice's characterization of the classroom energy as calm and crashing, and that she could feel and touch it. Also implied in this example is the auditory juxtaposition of these sounds. Opposing affects were also noted in that teachers' talked of feeling needs of being attached yet separated, feeling pleased and not pleased, feeling limited to one option and wanting many, etc.

While some opposites or contradictions were perceived more in one mode than another, there frequently seemed to be an overlapping. The "calm" and "crashing" waves for example were described as being seen, felt, and heard. The giants and midgets example was probably conceived of as having contradictory impact both visually and logically. On the visual level it is surprising to see a giant and midget especially if they are juxtaposed. On a logical plane it is surprising to recognize that two beings of such dissimilar appearance are of the same species.

Criterion number 2: Opposing elements were simultaneously juxtaposed. Determining whether opposites, antitheses, etc. were juxtaposed and perceived simultaneously was difficult. However, there was evidence that opposites were simultaneously perceived and the evidence came in three forms: 1) there were direct descriptions of simultaneity; 2) ideas were developed that suggested simultaneous opposition; and 3) circumstantial evidence.

The first of these three forms of evidence were actual descriptions by the teachers that they perceived opposites at the same time. For instance Jessie was quoted earlier as saying:

> I was visualizing two things happening at the same time. One was sort of a running commentary of how this might get out of hand and, simultaneously, how it could be maintained so that it wouldn't...

Such direct descriptions were very rare, and the researcher had to rely more on analyzing ideas for evidence of simultaneous opposition

or contradiction. Jessie's image of the giant and the midget together was an example of an idea that embodied a simultaneous juxtaposition. Another example was her image of people littering with soap which suggested a simultaneous littering and cleaning.

Third, circumstantial evidence suggested simultaneous conception of opposites. Many instances occurred when teachers indicated that ideas just "popped" into their heads. Ideas would come rapidly in flashes, with many visual images occurring within fractions of a second. However, this did not constitute conclusive evidence that opposing images or sensations were perceived simultaneously, only that they occurred rapidly. It might easily be argued that the images were never juxtaposed, but, rather, placed so closely together in time that they seemed to occur simultaneously. Alice's comments on this topic illustrate the difficulty she had in making this determination.

> It's like I'm seeing pictures -- but a picture is made
> up of separate frames and you're saying, "Well, what was
> this frame?" and I'm saying, "I don't know," I can't see
> it that way...to help you understand it. I sort of see
> a picture and you say, "Did it all happen at once?" and
> I'm thinking, "I don't know." I can't slow down the
> film....My sister does a lot of work in film, and they
> were doing a lot of work on editing film, speeding up
> and slowing down film.... They actually watched [Doug
> Henning] perform his magic. They watched him pull a
> rope in his sleeve. They watched this woman step out
> from behind the curtain because they could slow it down
> so slowly -- and I thought that was the most marvelous
> thing in the world, so that was magic to me. And if I
> can't see it, even though I can really see it (leaves
> sentence unfinished). So when you said that, I thought,
> I pictured -- I wish you had that on film so that you
> could see each frame. Like it's frames, and it goes
> (snaps finger) like this. And I'm aware that they're
> happening, and some are speaking frames and some are
> moving frames, but I can't capture all of them. I could

tell you in a thirty second block, but there could be two hundred and fifty thousand frames in that.

Although the figures Alice cited were spoken figuratively they do accurately characterize the essense of the problem of determining whether images may have been perceived simultaneously or sequentially. This researcher was left to question whether it was possible to determine with complete certainty whether two or more ideas (opposing or otherwise) could actually be perceived simultaneously. What may be more important than actually perceiving opposites simultaneously is the _appearance_ of having been perceived simultaneously.

Proving that opposites were simultaneously juxtaposed was further complicated in the study becuase language appeared to have a biasing effect on teachers' descriptions of their thoughts. To be understood clearly by others, our language requires sequentially ordering thoughts. Therefore, it was perceived that the linear syntax of language tended to bias teachers' descriptions about their thoughts into linear patterns even though they may have conceived of non-linear images. For example, when Debby was asked about the sequential or simultaneous nature of her thoughts about how she perceived the images she had about Marie in Puerto Rico she said:

> I think that it was more here then there, I think it's, maybe I always try to break up things for people and for kids....It's like, okay, what's the first step, what's the first logical step?

This was a surprising account in view of the teacher's earlier comments that she almost always thought in terms of images and that she was having a great many images occurring rapidly at the time of her interaction with Marie.

In addition it seems likely that our language not only has a sequencing effect on our description of our thinking, but may also tend to influence the thought patterns themselves. Because of the potentially sequencing effects of language on the teachers' descriptions, the researcher began to question the wisdom of using interviewing and journal keeping as means of gathering data about a thought process thought to be non-sequential. More will be said about this in the analysis of the methodology presented later in this chapter.

<u>Criterion number 3: An original and useful product, solution, or idea was developed</u>. It was observed that janusian or janusian-like thinking was not always traceable to any sort of final product. This observation may be explained in two ways. First, janusian conceptualizations tend to produce "wild ideas" which the teachers may have tried to stifle. For example, Jessie's soap suds fantasy of people dropping soap was dismissed as having nothing to do with what she wanted to teach the class. However, had she explored the idea further she might have discovered ways of employing the ideas in a lesson. One possibility would have been to have the children "invent" new kinds of food wrappers that would clean the environment when people dropped them. Moreover the researcher observed that

teachers were generally hesitant to share the images and wild ideas that they had, frequently prefacing remarks by saying such things as "You're going to think this is crazy..." or after saying something they felt was offbeat, asking, "Who's going to be listening to this?"

Secondly, janusian thinking is conceived of as being a "way station" toward the integration of ideas by other means such as homospatial thinking. Therefore, janusian thoughts may be transformed, or embellished to make them more palatable or useful, and in so doing the janusian elements may not be distinguishable in the final product. The "giants and midgets" example offers an illustration of this. The conceptualization of the giant and midgets was a step in the process leading up to the clown sequencing idea. The initial juxtaposition of opposites was elaborated by using the clowns which were more "circus like." The sequencing aspect was added to enable more children to work on the activity at one time, and also to give the children more opportunites to make comparisons.

The usefulness of the ideas frequently had to be couched in terms of their potential usefulness. For instance, the clown sequencing idea and the soap suds fantasy idea were never fully elaborated and used with the class. Thus it was only possible to speculate on how well the ideas could have satisfied the teacher's needs. In cases where janusian thinking was linked to general principles that guided a teacher's interaction with her class the teacher's perceptions of usefulness were the only means of judging this criterion. Alice's feeling of being attached yet separate from

her class was described as helping her to gain a feeling of comfort in her class, but this was not something easily observed and confirmed by an outside observer. Therefore it was necessary to be satisfied with the somewhat vague descriptions of usefulness teachers perceived for various thinking processes.

Assessing usefulness was further complicated by the many variables operating in the classroom at any one time that could influence children's behavior. Alice's "strong flexible" approach with the boys who were like brick walls suggested that her approach with them was highly successful, however, because the boys were interacting with other children around them it was possibly other intervening events, unknown to the teacher and researcher, that accounted for the success of the interaction. Therefore, it was frequently difficult to directly attribute the success of an interaction to any one appraoch employed by a teacher in a complex social environment such as a classroom.

None of the ideas which were produced by the teachers resulted in any major novel or unique learning activity or approach. The newness of an idea was difficult to judge because, as Jessie put it, most lessons are built upon lessons that have previously been taught. Alternatively, the teachers indicated that almost every instructional setting presented them with a unique situation; they have to deal with new students, in new circumstances and new material.

<u>Criterion number 4: Teacher was consciously aware of her</u>
<u>thought process.</u> In each of the cases where teachers were perceived
to have employed janusian or janusian-like thinking processes, the
teachers were actively pursuing answers to questions or solutions to
problems. From this perspective the teachers were consciously aware
of their thinking and were not halucinating. However, the teachers
were only infrequently aware that they were consciously juxtaposing
opposites or utilizing contradictory conceptualizations in the
process. In the analysis of the examples it was deemed sufficient
evidence that the teachers were conscious of their thinking if they
were actively addressing some educational concern. But it was also
recognized that in the instances where the teachers were consciously
aware of opposition or contradictory elements, their ideas appeared
more alive and powerful for them in their planning. This observation
suggests that there were levels of conscious awareness and that the
greater the level of the teachers' awareness of contrasting ideas, the
greater interest and insight teachers showed about a topic, problem,
or situation.

<u>Concluding remarks.</u> An examination of the data suggests that
janusian or janusian-like thinking processes were employed by the
teachers, although these processes infrequently led to observable
instructional products and had to be described in terms of their
<u>potential</u> usefulness. Moreover, there appeared to be levels of
janusian thinking. Most of the examples of the process appeared to
indicate that there were varying degrees of opposition, simultaneity,

uniqueness, utility and conscious awareness which always threw into question the interpretation of the examples.

Additionally, janusian-like processes were often accompanied by homospatial-like processes and they appeared to work in concert with one another. At times both processes appeared to be operating simultaneously; at others janusian processes appeared to occur first and were later modified by homospatial processes.

Finally, teachers tended to select activities from commercially prepared materials, journal articles, and tradebooks, which in some way embodied a juxtaposition of opposing elements.

Homospatial Thinking

The four criteria that were used for identifying examples of homospatial thinking were: (1) multiple images were evident; (2) images were superimposed or fused; (3) an original and useful product, solution, or idea was developed by the teacher; and (4) the teacher was consciously aware of the thought process. Findings for each of these criteria are described below.

Criterion number 1: Multiple images were evident. Visual imagery was the predominant sensory mode employed by the teachers in their planning. In fact one teacher expressed surprise at the thought that thinking was possible without the use of visual imagery. Frequently teachers described their thoughts about planning in terms of images in which they "pictured" themselves in their classrooms, interacting with students, almost as if they were rehearsing the

events that they planned to do with their students. The teachers
reported that the visual planning that they did often occurred out of
school: while they were driving home, playing cards with friends,
laying in bed, showering, doing household activities, etc. During
these activities they reported that images would "pop into their
heads." They would see a student or group of students, materials for
a lesson, or an activity to try with the students. Teachers expressed
surprise that these ideas came when they did, as they were not always
intending to do "curriculum planning" in these "off duty" hours.

One of the most frequently described subjects in the teachers'
images were the students' facial expressions and their body language.
For instance Debby often talked of the look on Marie's face
(especially her eyes) as an indicator of Marie's understanding and
mood. This was done not only in school but she would imagine Marie's
face and the faces of other students in after-school hours. Alice's
descriptions of her images of the boys as brick walls is another
example of this type of imagery. The teachers also indicated that
during their planning for instruction or during the implementation of
a lesson they would have visual images of other significant people in
their lives -- relatives, friends, parents, and instructors from their
college course work. Debby, for instance, reported that in trying to
think of an approach with one student, she had images of a course
instructor she had and remembered a strategy that that person had
recommended.

Other visual images which the teachers reported were images of lesson content, charts they would need, story books they should read to the class, and images of how the students might use these materials. Such images appeared to serve the teachers by letting them do a trial run of the activity in advance of the actual lesson, so that they would see if the materials would be suitable and capture the students' interest.

Auditory and tactile sensations were also in evidence, but to a lesser degree than the visual imagery described above. Each of the teachers reported that as they were planning activities, they imagined "hearing" children objecting to activities because they were too difficult or that the instructions were not clear enough. This auditory troubleshooting was frequently used in conjunction with the visual imagery described above as a means of minimizing or avoiding problems. Tactile sensations were also described as entering into the information teachers used to make decisions about instruction. For instance, Alice talked of being able to "feel" and "touch" the energy in the classroom. Also she spoke of the feeling she sensed of the boys becoming hard like rocks and she could express this with her own body.

Finally, the teachers described affects that they experienced in conjunction with their planning and implementation of instruction. Debby described feelings of what Marie had experienced in her Puerto Rican school, Alice described her feelings of needing to be both near and distant to her class, and many other similar examples could be described.

The data clearly indicated that the teachers used many forms of imagery in the planning and implementation of instruction. Visual imagery appeared to be the most important tool for the teachers' mental planning, but auditory and tactile sensations were also common. The teachers also reported that affects also entered into their planning decisions.

Criterion number 2: Images were superimposed or fused. Superimposition of images in homospatial thinking, like simultaneity in janusian thinking, was difficult to prove. This difficulty can be explained in part by using Alice's film metaphor again. If the images were perceived as frames on a reel of film, it appeared that the frames moved too fast in most cases for the teachers to know if their images were actually perceived as separate or superimposed frames. The questions that this raised for the researcher was, "If the images were only one frame off from being superimposed, then would this have disqualified it as an example of homospatial thinking? How about two, three or ten frames?" In considering this question, it was interesting to note that normally twenty-four individual frames are projected onto a movie screen in one second, yet these are not perceived as separate by the viewer. Moreover, in scenes which "fade" into one another, what the viewer sees as superimposed images is actually looking at individual frames of the two scenes interspersed with one another. What this suggested was that the perception of fusion or superimposition of images does not necessarily require that images _actually_ occupy the same space, but appear close enough

together in space and time that the distinctive qualities of separate entities are <u>perceived</u> to combine.

Although the teachers were never certain that they actually superimposed images, there was evidence to suggest the presence of the process. In several instances the teachers made direct statements that they may have fused images. Jessie indicated that she felt that she had been seeing geometric shapes in the clown she had drawn and that she was seeing both at the same time. Alice indicated that she was seeing both boys and brick walls as she was trying to get them to do the proper assignment. And in a separate instance she indicated that she may have fused the words of a child with words she had had with her husband in a discussion. In each of these three cases the teachers expressed some doubt about the fusion of the images and allowed that the images may have been perceived separately, but very close together.

Other evidence implied different kinds of fusion. Alice's comments and body language indicated that she may have fused the kinesthetic and vesual properties of being near and distant to an object with a need to be psychologically near and distant to her class (see specific example 6). In another episode a fusion was implied by Alice's description that the classroom energy could be touched, felt, seen, and heard as if it were a body of water with calm and crashing waves.

The appearance of empathic homopatial processes was also suggested in several instances where teachers appeared to fuse

themselves in the situation that their students were in. Debby appeared to place herself in Marie's position in a school in the Caribbean, to get a better understanding of her background. Similarly, Alice's statements implied that she had placed herself in the position of becoming hard like a brick wall in a way that better enabled her to determine what the boys were feeling during her interaction with them.

In summary, there was strong evidence to suggest that homospatial thinking did occur, but this could not be proved with absolute certainty. Teachers frequently only had a vague recollection of their images and were not certain whether images were actually fused or just brought close together in time and space. The teachers' uncertainty suggested that there may have been levels of superimposition. More is discussed about levels of superimposition under criterion 4, conscious awareness.

Criterion number 3: An original and useful product, solution, or idea was developed. No major creative products or effects were judged to have been developed by the teachers in the course of the study. However, some of the teachers' ideas and approaches were somewhat novel and potentially useful. In this regard, creativity on a modest level occurred. The products and effects which were observed were of three types: content, process, and affective.

There was only one clear example of lesson content resulting from a homospatial-like fusion and that was Jessie's idea of the clown and geometry lesson. The idea was new to her and she felt that it

would be potentially useful for integrating a lesson on shapes into the circus theme that the class was studying.

Most of the products developed by the teachers were ideas for how to interact with students. The product of Alice's idea that the boys were getting hard, was an approach of not pressing them, and of presenting a flexible posture to them. Additionally, Alice's perception that she was using the same approach with Ian as with her husband produced an effect of helping her recognize that an alternative approach was needed. She then tried other approaches. A final example of process-related products was Debby's placement of herself in Marie's situation that led Debby to suggest a reversal of roles.

The third type of product was an affective result. The clearest example of this came from Alice's description of the comfort she could feel in the classroom by recognizing the multiple perspectives which were possible through holding her classroom away from her and yet being attached to it.

Determining the originality and usefulness of the products and effects of homospatial thinking posed the same difficulties already discussed for janusian thinking. The products were judged to be partly new in that new situations were being addressed, students and their needs varied and changed, and some of the content was new, but much of the instruction was built upon lessons that the teachers had taught at some time in the past. Judging the usefulness of a specific teacher action was complicated because many variables were acting on

each situation and it was difficult to know if the teacher's strategy alone produced the desired effect.

Criterion number 4: Teacher was consciously aware of her thought process. As with this criterion for janusian thinking, it was deemed sufficient evidence that the teachers were consciously aware of their thought process if they were actively addressing some instructional concern. From this perspective all of the examples which have been presented satisfied this criterion. It must be added, however, that none of the teachers indicated with certainty that they consciously fused discrete entities as a means of making new combinations. Only in retrospectively discussing the examples did teachers indicate that superimpositions or fusions could have occurred. This observation pointed to two levels of conscious awareness. One of actively searching for an answer or solution to a problem, etc., and a concommitant awareness of the images which have been brought together. The second level of awareness is being conscious of the way in which the mind is manipulating the images, that is, if images are fused, superimposed, or otherwise brought together. The teachers in the study had only peripheral awareness of the way in which ideas were coming together, and this seemed to vary with each example, suggesting that there are levels of conscious awareness. Because the teachers were not entirely conscious of how they were manipulating the iamges, it could be inferred that far more superimposition of images occurred than the teachers were able to describe. Alternatively, there may have been less than was suspected.

Concluding remarks. Although there were only modest levels of creative behavior exhibited in the study, elements of homospatial thinking appeared to be present in numerous examples. Proof that images were fused or superimposed was difficult to obtain as teachers were not able to relate with much certainty how the images were actually perceived. The strongest evidence that the process had been employed was found in Alice's description of the "Boys and the brick walls" in Example 4.

Discussion of the Methodology

The central question considered in the assessment of the methodology is, "Did the methodology provide an adequate means for observing and documenting evidence of janusian and homospatial thinking?" The examples presented in the preceding sections of this chapter suggest that the methodology was at least partially successful. With regard to janusian thinking, the methodology provided adequate evidence of opposites, antitheses, and contradictory elements in the teachers' thinking. However, some difficulties were encountered in assessing three of the criteria. First, the interviews, observations, and written documentation provided insufficient evidence in most instances to determine if the teachers conceived of opposites simultaneously or sequentially. Secondly, few substantially new and useful products or effects emerged. In part this may have been a deficiency of the data collection procedures. Finally, determining conscious awareness was at the same time a

problem and not a problem. On the one hand, the criterion of conscious awareness was so defined that it was easy to confirm that teachers were conscious of their intentions. On the other hand, teachers varied in their level of awareness of the actual process of simultaneously or sequentially juxtaposing opposites.

Regarding homospatial thinking, the methodology was successful in eliciting teachers' descriptions of the imagery associated with their thinking. Despite this success, several methodological deficiencies were noted. The major difficulty was that the methodology produced insufficient detail about the teachers' thinking to draw firm conclusions about whether images were actually superimposed or fused, or whether the images were just close together in space and time. In addition, the same difficulties already noted for janusian thinking regarding the criteria of "new and useful products," and "conscious awareness" proved to be similar to those for assessing homospatial thinking.

On the following pages, aspects of the methodology which contributed to the successes and difficulties experienced in observing and documenting evidence of janusian and homospatial thinking are presented. The successful aspects are discussed first and the difficulties are presented second. The remainder of the chapter presents a general discussion of the effectiveness of the various stages of the data collection and the analysis process.

<u>Successes Eliciting Janusian</u>
<u>and Homospatial Thinking</u>

The methodology successfully elicited teachers' descriptions of opposing elements and multiple images. The success of the methodology in these regards was attributed to several factors which were designed to help the teachers feel comfortable about describing combined images, opposing elements, contradictions or any ideas which might be regarded as "wild" in nature.

First, the participants were comfortable in confiding some of their "wild" thoughts because they had known the researcher for several years, and had developed a friendly working relationship and had established a level of trust with the researcher. A second aspect of the study which contributed to the participants' comfort was that all of the lessons and interviews took place in the teachers' regular classrooms. They appeared to be very much "at home" and relaxed during the interview sessions. Third, it was important that the teachers could be guaranteed some level of anonymity. When teachers became uneasy about having shared some "offbeat" idea, reassurances about protecting the subject's identity appeared to lessen their anxiety.

The fourth, and perhaps most important element in encouraging teachers to comfortably share unconventinal thoughts, was the use of the think aloud strategy, in which teachers were encouraged to describe "wild ideas." It appeared that directly acknowledging that it

was legitimate to have wild ideas, helped to make it possible for teachers to share thoughts which others might regard as "crazy." In no instance was it possible to directly link the use of prompts in the think aloud approach to a teacher's description of a particular janusian or homospatial conceptualization. However several examples appeared shortly after the researcher prompted the teachers with the think aloud principle, "Say whatever is on your mind. Don't hold back hunches, guesses, wild ideas, images, intentions." For example, Alice's description of the "boys as brick walls" came about a minute after this type of prompt was given.

In reference to the criterion of conscious awareness, the methodology was successful in narrowly defined terms. In the study teachers were regarded as having been conscious of their thinking if they had been actively trying to solve a problem or produce some desired instructional effect at the time that opposites or images were brought together. In every case where opposites appeared to have been brought together simultaneously or images fused, the teachers had been actively pursuing some educational end. Therefore, for the purpose of the study the criterion of consciousness was satisfied. To cite an example, Jessie's idea of the giant and midgets emerged from her conscious efforts to develop a measurement/comparison activity related to the circus theme. The criterion did not require that she be consciously aware of any juxtapositions or superimpositions. Although

it was not requisite for identifying an example of janusian or homospatial thinking to have the teacher aware of the process, the lack of such awareness made confirmation of the criteria of superimposition and simultaneity difficult. This discussion is taken up again below.

Difficulties Documenting Janusian and Homospatial Thinking

Generally speaking, the methodology generated insufficient evidence to determine with much certainty whether opposites were conceived of simultaneously or sequentially in janusian thinking, or whether images were superimposed in the same space in homospatial thinking. Two major reasons were thought to underlie this difficulty. First, the medium for collecting the data was somewhat inappropriate. The linear syntax of language appeared to generate sequential accounts of thoughts and images which were not necessarily of a linear nature. Having the teachers represent their thoughts through other means such as drawings, diagrams, or models might have helped circumvent the sequencing bounds of the language and might have generated the additional information needed to draw firmer conclusions.

A second reason difficulty was encountered in determining if the teachers' thoughts were conceived of simultaneously was that, in most cases, they were only peripherally aware of the manner in which the images or sensations were perceived. It has already been indicated

that the teachers were actively addressing educational concerns in all
of the instances reported, but this awareness only vaguely extended to
the actual thought processes involved. This observation is not
surprising. The situation is somewhat akin to trying to confirm
positively whether a person was conscious of their heart beating a few
seconds before posing the question to them. In this study the
teachers were much more aware of the intentions and products of their
thinking rather than actual processes. Over the course of the study
the teachers were becoming more aware of their thought processes;
however, the study ended before any significant benefit of the
increased sensitivity could be realized. From this standpoint an
extended length of time in the field may have been warranted.

Although the methodology was successful in providing evidence of
the teachers' ideas and approaches for instructional activities, their
creativity was of a very modest level. Because of this, it might be
argued that teaching does not lend itself to creativity, and this is
true to some extent. Time constraints frequently require teachers to
make fast decisions and permit little time to elaborate on a creative
idea and make it workable. Therefore, many good ideas are abandoned
when teachers recognize that the time and energy required to implement
these ideas exceeds the time and energy that they have. Despite these
time limitations and other inhibiting factors discussed in Chapter II,
this researcher believes that teaching can still be a very creative

activity. For this study it was felt that the low level of teacher creativity could, in part, be attributed to problems associated with the research schedule and the presence of the researcher in the classroom.

First, the time of year in which the study was conducted was not well suited to observing teachers engaged in creative endeavors. The teachers indicated that they had very little energy left at the end of the school year for initiating new learning activities. At the time of the study the teachers were devoting much of their energy to conducting and preparing for parent conferences and attending placement meetings for the coming year.

Secondly, the research schedule did not capture teachers thinking about new units of instruction such as planning an eight-week course. In all cases, this kind of planning had already been performed. The researcher only observed short-range planning, which understandably would not encourage teachers to invest large amounts of time and energy in being creative.

Finally, it was perceived that the researcher's presence in the classrooms may have caused teachers to elect to do more conservative activities, ones that they were sure would work. Had the researcher spent longer periods of time in the classroom this effect may have been lessened, and the teachers may have started to take greater risks.

<u>General Discussion of the Data</u>
<u>Collection and Analysis</u>

<u>Research settings</u>. All of the interviews and observations were
held in the teachers' classrooms. On the whole it was important to
have the teachers feel as comfortable as possible so that they would
be willing to take greater risks in trying new ideas. Therefore their
regular classrooms seemed the best location to collect the data. An
additional advantage of holding the interviews in the teachers'
classrooms was that it permitted the researcher and teacher to point
to specific places in the room where certain events took place or
where a particular activity was going to take place. This helped to
stimulate the teachers' memory of events and helped them to visualize
plans for future efforts.

Negative aspects of holding the interviews in the classrooms
were that the interviews were regularly interrupted by telephone
calls, public address announcements, visits by other teachers, and by
students who stayed after class or returned for forgotten items. In
one classroom clanging heating pipes were a constant annoyance and
added to the difficulty of transcribing the taped interviews. On
another occasion repairs to the fire alarm system resulted in the
interview being disrupted every fifteen minutes by the sounding of the
alarm. Despite these negative aspects, classrooms were the most
desirable settings because of their convenience and familiarity to the
teachers.

Timing of the interviews. Holding the interviews directly after school was the most convenient time for the teachers. All of the post-instructional interviews occurred on the same day that teachers taught the lessons; this helped to keep forgetting to a minimum. The after-school interviews did have a couple drawbacks. For one thing, the teachers were tired at the end of the day and did not have a lot of energy to invest in the interviews. Secondly, all three of the teachers indicated that they did not normally do much of their planning right after school and that it seemed unnatural to them to be planning then. Efforts were made to identify a better time for the interviews, however no suitable alternative was found.

Time pressures. In addition to time pressure brought on by end-of-year activities, the research project placed additional demands on the teachers. These time demands were the source of some recurring problems. Although the time commitments of the study were explained verbally and in writing (Appendix B), and the teachers agreed to participate, they complained that the project was taking up too much time. The time spent in the interviews was actually well within the amount originally negotiated. Rather than confronting the teachers with this and risk antagonizing them further, their feelings were acknowledged and the researcher tried to show empathy, agreeing that the school did appear very busy, that the interview sessions required a lot of energy, and that the interview sessions were exhausting. The teachers reported that after the sessions they felt drained. This suggested to the researcher that the teachers were not so much

protesting the amount of time required as the amount of energy required.

Nature of the interviews. Interview guides were useful in focusing the questions during the interviews. The flexibility and free-flowing nature of the interview sessions provided a sense of informality which helped the teachers feel at ease during the interviews. Typically the interviews covered a wide range of items, many of which were not always focused on elements of janusian or homospatial thinking. This broad focus, although time consuming, helped to disguise the specific intent of the research effort. However, having a broad focus took away time that was needed to more fully and deeply discuss the elements which were of a janusian or homospatial nature.

The interviews did explore many of the teachers' thoughts in detail. In some instances this bothered the teachers. While the teachers felt that it was important to explore their thought processes, they indicated that the details of these processes were trivial. One teacher in particular tried to control the direction and pace of the interviews by calling for the next question before the first one had been fully addressed. And on another occasion a teacher dismissed a question as not important. Such maneuvers were seen as responses to the time pressures related to the end-of-year demands on the teachers.

The focus on change the teachers made in their plans which were later discussed in the interviews was perceived as useful in

identifying times when teachers were developing new ideas. The researcher's focus on these instances and use of prompts from the think aloud approach (i.e., What are you thinking now?) helped in many cases to get the teachers to elaborate upon their thought processes which were not often described in very much detail. The teachers generally found it very hard to focus on their thinking and tended to talk about their solutions to problems and give rationalizations for having made the decisions they made. The teachers expressed frustrations at being unable to describe their thoughts in the detail that was being asked of them. The difficulty of giving such descriptions was acknowledged by the researcher, and teachers were encouraged to describe as much as possible. Teachers' memory of events appeared to be stimulated by having them imagine the situation under discussion, recreating as many of the elements of the situation as could be remembered.

Occurrence of the examples. Evidence of janusian and homospatial thinking was found in each of the various interviewing stages. However, no individual teacher showed evidence of the thought processes in each stage. Figure 4.1 on the following page illustrates the stage and sequence in which the previously described examples were elicited. Because each of the examples varied significantly in the nature and degree of the evidence of the two thought processes, it was perceived inappropriate to enumerate and statistically compare various stages in regard to their power of eliciting evidence.

Figure 4.1. Occurrence of Examples.

Time	Pilot Interviews (post-instr.)	First Planning Interview	First Post-Instructional Interview	Second Planning Interview	Second Post-Instructional Interview	Final Interview
	April-May	May-June 1982	May-June 1982		June 1982	Dec./Jan.
Jessie	No evidence	Applecore activity......	Soap Suds Fantasy	Giants, midgets and clowns	No evidence	Seeing Ideal and Opposite
Debby	No evidence	No evidence	Marie in Puerto Rico	Interim Interview — No evidence	Teacher as student	Confirms some earlier examples
Alice	-Boys and Brick walls -Waves/Energy -Involved/not involved -Boxes	Coffee cup	No evidence	No evidence	Ian can't decide Ideal and opposites seen at same time	Confirms some examples

It as noted, however, that the bulk of the examples emerged during interviews which followed implementation of lessons (this includes both pilot and post-instructional interviews). That more examples were found during these interviews was not surprising because much more information was available to discuss. For example, in the post-instructional interviews the topics for discussion were drawn from the teachers' journal entries, observer's field notes, and the teachers' own observations of the classroom events. In the planning session interviews the data consisted only of the teachers' thoughts at the time. It should not be construed that because more examples occurred in the interviews following lessons that they were more important; in fact, part of the success of the post-instructional interviews was due to the foundation formed for the researcher in the planning sessions. Knowledge gained in the planning sessions enabled the researcher to formulate better-focused questions on aspects of the lesson which had changed.

From Figure 4.1 it can also be noted that occurrences of the examples did not follow any particular pattern over the course of the investigation. It was anticipated that as the teachers became more attuned to their thought processes that the quality and frequency of the examples would increase. However, this did not occur. The teachers' comments suggested that they did become more attuned to their thought processes over the course of the study, but these gains may have been offset by the pressures of end-of-year responsibilities which drew energy away from initiating new activities.

The frequency and quality of the teachers' new ideas and the associated thought processes was probably more a factor of the teachers' moods and energy levels at the times of the interviewing sessions than of the time of year. For instance, no evidence of the processes was observed for Alice during the first post-instructional interview and the second planning sessions (see Figure 4.1). This coincided with a period when she was ill and feeling that she had little time for the project. She summed up her feelings at the end of the second planning session by saying, "(the project) is really becoming a pain." Although it appeared she would drop from the study at this point, she did not and produced thoughtful and detailed accounts of her imagery leading up to the final lesson.

The data did not suggest that any one question or set of techniques was primarily responsible for eliciting the examples. All of the various forms of data collection were perceived to have been useful in eliciting evidence. As was pointed out earlier, most of the examples lack sufficient evidence to make clear determinations about the qualities of simultaneity and superimposition. This suggested that refinements in the methodology are needed. Specific comments about the effectiveness of the data collection stages are described below.

Effectiveness of the planning interviews. The initial planning interview sessions included a "warm-up" activity. These warm-up activities did seem to familiarize the teachers with the process of thinking about one's thinking. The researcher could comment about the

kinds of responses the teachers gave and help them identify when they were giving descriptions of their thought processes, descriptions of their ideas, or rationalizations for an idea. Generally, the teachers expressed that they had difficulty thinking, thinking about their thinking, and describing it at the same time. Such comments made it clear to the researcher that the teachers were aware of the distinctions between their ideas and the processes that produced the ideas. It was important that this differentiation be made early in the process, as it helped focus the remaining interviews.

An objective of the planning interviews was to identify an activity or goal for the class. It was hoped that the teachers would not consider what they were going to teach until the actual planning sessions; however, in most cases, there was evidence to suggest that the teachers had already given thought to the topics. This made it somewhat difficult to capture the early thoughts the teachers had had about the lesson as they were being freshly conceived. In that janusian thoughts are believed to occur very early on in the thinking process, it seems possible that numerous instances of this process were missed. An alternative that was considered in the planning of the research model was to assign topics to the teachers to help reduce the amount of prior thought they could give to the lesson. This approach was not used because it was thought that it would make the process too artificial. In retrospect, this approach may have been preferable.

The researcher introduced a technique not initially planned as part of the methodology after reflecting on the teachers' difficulty with thinking and thinking about their thinking at the same time. The researcher brought a second tape recorder to the interviews so that after the first twenty or thirty minutes the first tape could be rewound and segments played back to the teacher. The second tape recorder captured the teachers' thoughts about their thinking as they listened to the first tape. The use of this technique was employed for each of the second planning interviews, and was judged to have helped elicit numerous images which were missed the first time through.

One final note about these sessions was that one of the teachers had scrap paper beside her and would spontaneously doodle as she talked about her plans (see the giants, midgets and clowns example). This provided useful evidence of her thought processes, but was not a part of the methodology as it was initially planned. In retrospect, the methodology could have done more to faciliate this kind of activity.

Effectiveness of the teacher planning sessions. After the planning interview and prior to the actual implementation of the lessons, the teachers were requested to either tape-record their thoughts and/or to record their thoughts and thought processes in a journal. All of the teachers elected to use the journal keeping approach. The combination of the inconvenience of carrying a tape recorder around and the mechanical, artificial nature of recording

their thoughts were seen as the reasons for teachers' decision against using the recording machines. As one teacher stated "...a tape recorder is one more thing that I'd have to carry around. You know, I already carry bundles." She added, "I guess that I see it as too much of a machine; I'm tired of using machines; I don't want to deal with machines and I don't have to. I just can't see myself pressing a button and saying, 'Gary, I'm thinking about this now'." (laughing) "It just seems too artificial."

Using the journals to document the teachers' thinking during the time between the planning interview and teaching of the lesson proved difficult. Two of the teachers kept fairly complete notes although they tended to summarize many of their thoughts rather than focus on their thought processes. Nevertheless, the journal entries were very useful in helping the teachers to recall their thoughts, and they helped the researcher focus his questions. Just the expectation that the teachers were to record their thoughts appeared to sensitize them to their imagery and thought processes. This heightened awareness probably assisted them in recalling thoughts even though these were not always entered into the journals. This was particularly evident for the teacher who recorded very little in her journal. In one post-instructional interview she said "...today I didn't get a chance to write, but sort of intermittently I had images of..." and vividly described images of a student. In another instance she indicated "...this is what I would have written down if I had the energy to pick up a pencil. Last night at 9:15 I was cleaning off the table and..."

and described images of another student. The comments suggested that
the teacher was very much aware of her thoughts and attuned to the
ideas and images she was having. Although the teacher's recall of
these events seemed vivid, their accuracy was taken with a measure of
skepticism. The teacher may have been just trying to give the
impression of having had clear images of her thinking, providing
herself with means of justifying having not performed the
record-keeping activity.

One of the teachers also noted that the idea of keeping the
journal interfered with her thoughts about her teaching because some
of her thoughts came at a time inconvenient for recording them. So
instead of continuing the thought, she would curtail it, so as not to
feel guilty about not recording it. She said,

> But as I said here I really felt like I cheated part of
> the way, for instance, as I was riding to the movie...I
> started thinking about this and said (laughing) "No I
> don't want to think about this now." And I did it
> (again) last night too.

Feeling guilty about not writing the ideas may have also helped the
teacher to recall her thoughts in this case, because she appeared to
have a clear memory of the thoughts she had at that time and provided
a detailed description.

In general the teachers all felt that the journal keeping aspect
of the study consumed a lot of time and energy. The following
statement sums up one of the teacher's feelings:

> One of the things that was sort of like a weight was
> whenever you wanted us to jot down you know like a semi-
> diary whenever we thought about it. And I found myself

> thinking about it more than I cared to be thinking about
> it. And it was like writing it down or making a
> conscious note to be sure to tell you and that was like
> "enough of school already."

The same teacher put it another way.

> The journal was not anything that I was interested in...
> it wasn't feasible for me to stop what I was doing and
> immediately write it down. It wasn't practical. And it
> really annoyed me to think that I wasn't doing something
> that I should have been doing.

What became very clear during the interviews with the teachers about

this stage of their preparations for the lessons was that they had

many images about their teaching in the hours outside of school.

Having the teachers keep records of when these happened contributed to

having a more complete picture of how the teachers' thoughts evolved

and the images which significantly influenced some of their decisions.

Journal entries did provide a vehicle for entering into a discussion

with the teachers about their thought processes as they planned for

their lessons. Without these entries to focus on it would have been

more difficult to access these thoughts.

Effectiveness of the lesson implementation/observation state.

This stage of the methodology was designed to focus on changes in the

teachers' behavior during the actual implementation of the lesson. It

was intended that the changes observed during the lesson would be

discussed later in the post-instructional interviews. The researcher

took note of classroom events and recorded, in written form,

discussions and parts of discussions which were later reviewed with

the teachers to stimulate their recall of events. One observational

cue which seemed important as an indicator of change and perhaps creative behavior were pauses the teacher would make. These cues often indicated that the teacher was considering alternative approaches or trying to come up with an idea about solving some problem which was being encountered.

A characteristic in each of the classrooms which made observation of change difficult was that flexibility was frequently planned into the lesson. While it was the researcher's hope that observation of changes would lead to discussion about creative events, it was found that the teachers had frequently left parts of the lesson open to change so that they could let events move with the interests of the children. One teacher explained:

> When you want the children to be involved in the development of it and you want the children to be involved in the direction that it takes and part of the philosophy is that we discover together -- When we learn by discovery and we discover together then you are going to have fewer changes because the outcome is going to be less defined. Where you have a classroom where the lesson today is page 48 in the manual and this is where you have to get to, then the changes to get there may have to be more dramatic.

When planned changes did occur, they did not necessarily happen as the result of any teacher creativity, just the application of a standard approach. In these cases, discussions about changes became fruitless explorations.

Even though focusing on classroom changes was non-productive at times, on the whole observing teachers and focusing on perceived

changes in instructional approaches was a useful means of identifying potentially creative events.

Effectiveness of the post-instructional interviews. Generally each session began with a review of the teacher's journal and plan for the lesson; then the focus shifted to the changes which took place during the actual implementation of the lesson. The researcher found that having the teacher report back changes that she felt were most significant was the most effective way to start these discussions. The teachers were most aware of what had actually changed, and so the researcher didn't need to waste interview time making guesses about what the changes were. After discussing the teacher's perceptions, the researcher used the interview guide approach to address other changes noted during the observation.

These sessions were never lacking in subject matter for discussion. In fact, there was frequently too much to cover adequately. Therefore, the discussions were directed at the changes which were seen as being the most significant to both researcher and teacher. However, it was still not possible to explore many of the teachers' thought processes to the desired extent. This raised the question of whether or not insufficient time had been allotted to the interview or whether the desired level of introspection was possible.

Revision of the methodology stage. The revision of the methodology could not properly be called a specific stage as improvements in the approach were incorporated at various points during the study. As the researcher reflected about the interviews

and data, three modifications were incorporated. The first of these changes, discussed earlier, was the use of a second tape recorder during the interviews. This permitted replaying the teachers' descriptions of their thoughts about their thinking, and asking them to provide more specific descriptions of their imagery, hunches, etc. The use of this technique proved very valuable in the examples of the "Giants and midgets," and Marie in Puerto Rico." In both of these cases the teachers' descriptions of their imagery more than doubled in volume after they listened to their initial comments.

The second revision concerned the first principle of the think aloud strategy. In addition to having teachers describe their "hunches, guesses, wild ideas, images and intentions," the researcher added "intuitions, feelings, and voices" to the list. The inclusion of these were seen as a means of accessing other types of sensations the teachers might have perceived. The addition of "feelings" was made after the pilot interview with Alice. She frequently spoke in terms of feelings -- physical and emotional -- and this prompt appeared useful in interviews with her. The researcher also observed during the early interviews that the teachers rarely talked of "hearing" voices or sounds as they thought about their thinking. Following the inclusion of "voices" to the list of prompts, it was perceived that many more references to voices were given in their descriptions. The addition of the word "intuitions" appeared to have little effect on the teachers' responses. Either this term duplicated

the kinds of responses elicited by the word "hunches," or intuitions were too elusive for description.

The third modification of the methodology was the incorporation of external judges to assist in the verification of the data. The functions of the judges are described below in the discussion about analysis of the data.

Analysis of the data stage. The successes and difficulties of analyzing the data have already been addressed earlier in this chapter, and will not be readdressed here. Three points remain, however, which require further elaboration. First, is the transcription of the interviews; second, is the verification of the data by the teachers; and third, the verification of the data by the other judges.

The transcription of the taped interviews proved to be a demanding process. The task of transcribing the interviews extended well into the summer, with the researcher transcribing all but three of the interviews. Having the researcher transcribe so many of the tapes had both positive and negative effects. One positive aspect was that the researcher could enter additional descriptive notes onto the transcript which provided a fuller account of what took place in the interview. This included things like gestures the teachers made, and things which were pointed out around the room. However, the major benefit for the researcher was that the transcription process required listening very carefully to both the researcher's own comments and those of the teacher. The researcher found that some of his questions

were ineffective, too leading, too vague, etc., and began to make fine tuning in the questions being asked. This was viewed as particularly helpful during the pilot phase and early stages of the main investigation.

On the negative side, the process was very time consuming. Each interview lasted from one to two hours, and most of the transcripts averaged about 15 to 20 single-spaced typed pages. The longest was nearly 40 pages. The demands of transcribing on the researcher's time probably resulted in an unnecessary delay in the analysis of the data which was being collected. Having the interview tapes all or mostly transcribed by a professional typist, although costly, might have enabled the researcher to do additional follow-up interviews about questions which were raised but left unanswered in the discussions. However, by the time that all of the transcriptions were completed, the school year had ended and the teachers were on vacation and unavailable for further consultation.

Two means were employed in the verification of the data. The first was for the researcher to share his preliminary analysis of the examples with the teachers for their reaction and to see if they had alternative explanations for the data. This was done after the teachers had an opportunity to read the transcripts and after they had been given brief presentation about the theories of janusian and homospatial thinking. The teachers were asked to focus their attention on particular excerpts which the researcher had selected as having potential janusian and homospatial aspects. Each of the

teachers indicated that they read the excerpts and some corrections in wording were noted. In "final interviews" which lasted from one to two hours with each teacher, the researcher offered his interpretations and the teachers gave their reactions.

In these interviews many examples were dismissed because they were identified as being a routine application of an instructional strategy. Other deletions were made because a metaphor used by the teacher during a lesson was used in only a clichéd sense. One teacher, for example, who indicated that a child used a radio as a "security blanket," said that it was just a phrase which she used and hadn't really attached any imagery to it. In this case, the metaphor was "dead." In some of the other examples which were retained, it appeared that some metaphors which have become overused like the "brick wall" example, were actually very much "alive" for the teacher. The boys really did appear to be walls.

The teachers were specifically asked whether they perceived opposites, antitheses, contradictions or reversals and whether these were perceived simultaneously. Also, where multiple images, sounds, or feelings were expressed, the teachers were asked to comment about the possibility of superimposed or fused entities. In many of the cases the teachers confirmed the researcher's analysis, although in a number of cases the teachers had significantly different perceptions. These areas of agreement and disagreement were already noted in the presentation of the specific examples. There are several factors

which might explain the differences in opinion between the teachers' views and those of the researcher.

First, the brief introductions about the theory which were given to the teachers provided them with an insufficient understanding of the theory. Although the teachers were provided with definitions of the processes and an explanation of several examples, the teachers were frequently confused about how the processes were supposed to operate and continually got the two processes mixed up. Their confusion and lack of a thorough background about the theories appeared to contribute to their reluctance or inability to clearly agree or disagree with the researcher's interpretations.

Next, the researcher and the teachers did not always attach the same meaning to certain terms. The word "contradiction" for instance had a distinctly negative connotation for one of the teachers. When the researcher pointed out that the teacher had employed a strategy that involved a contradiction, she became noticably piqued and took on a defensive posture. The impact of the word appeared to interfere with her willingness to concede that there might have been a contradiction involved, even though it might have produced a desirable educational effect.

Third, examples which might be considered "wild ideas" or those which were of a more personal nature tended to be down-played by the teachers. On several occasions teachers unexplainably did not wish to explore certain examples which touched on their personal lives, or were of a bizarre nature. In such cases the teachers were quick to try and change the subject.

Finally, it is worthy of note that the teachers might have been inclined to argue that they exhibited the processes of janusian and homospatial thinking because they were aware that they were associated with creative behavior. This did not seem to be the case, however, in many of the cases the teachers expressed a healthy amount of doubt.

The other major effort that was undertaken to help verify the analysis of the data was to have external judges review interview transcripts for evidence of the two processes. The judges independently examined the examples shown in Appendix F, using the evaluation forms in Appendix E. They attended a three-hour training session on the identification of the processes, and then took two days during their spare time to examine the excerpts. They were told that not all of the examples had evidence of one process and not the other. The judges' perspectives have already been presented earlier in the chapter.

Although the judges used a rating scale to indicate their degree of certainty about the elements of the processes, no statistical treatment was given to the data. Instead the reviewers presented their interpretations which were later compared to those of the researcher. During the six-hour session in which the various perspectives were discussed, many of the perspectives converged and a consensus was reached about the interpretations of certain examples. However, consensus was not something which was specifically sought or possible in all cases. The generation of various alternatives was perceived as a means of enriching the study, and consensus where it was reached helped to verify certain interpretations.

CHAPTER V

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary of the Study

This study explores teacher creativity and two thought processes, janusian and homospatial thinking, which are thought to underlie creative production. The two major purposes of the study were: 1) to develop and describe a methodology for observing and documenting evidence of janusian and homospatial thinking; and 2) to observe and describe occurrences of janusian and homospatial thinking which may take place as teachers plan and implement novel or innovative learning activities.

A foundation for the study was provided by Rothenberg's (1979a) theories of janusian and homospatial thinking which were compared to ten other selected perspectives about the creative process. A review of literature in creative teaching and a review of research into teachers' thought processes also shaped the focus of the study.

The setting for the investigation was an elementary school in Amherst, Massachusetts, and involved three regular classroom teachers. All were females, each with nine or more years teaching experience. Qualitative research methodologies were employed to gather data for the study. These included the use of classroom observations, in-depth

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interviews, teacher journals, and researcher field notes. All of the interviews were transcribed. The transcripts and other sources of data were analyzed for evidence of janusian and homospatial thinking.

Four criteria were used to identify examples of the two processes. Examples of janusian thinking were expected to exhibit evidence of: 1) antithesis, opposition, paradox, contradiction, or reversal; 2) simultaneous juxtaposition of opposing elements; 3) an original and useful product or effect; and 4) conscious awareness of the thinker. Examples of homospatial thinking were expected to exhibit evidence of: 1) multiple sensory images; 2) superimposition or fusion of separate entities; 3) an original and useful product or effect; and 4) conscious awareness of the teacher about her thinking. Evidence of the two processes was excerpted from the transcripts, and the researcher shared his preliminary findings with the particpants after having informed them about the exact nature of the investigation. Revisions in the analysis were made on the basis of the discussions with the teachers. A separate review of the data was performed by two trained external judges. Their independent analyses of the data were compared with the analysis by the researcher. Consensus was reached on the analysis of some of the examples, while alternative interpretations were generated for others.

The results of the study are presented in an in-depth discussion of six selected examples. Other selected examples are described more briefly. General findings about the two thought processes are summarized in regard to the extent that the criteria for each process

were satisfied. This is followed by a discussion of the effectiveness of the methodology in eliciting evidence of the process. The methodology is discussed in terms of the identifying criteria for each thought process, and in terms of the various stages of data collection.

The remainder of this chapter presents four major conclusions which emanate from the study. The implications and recommendations related to each conclusion are given. The chapter closes with three speculations about the importance of using janusian and homospatial thinking in educational settings. A summarized list of all the recommendations concludes this chapter.

Conclusion 1 -- Effectiveness of the Methodology

The methodology employed in the study was partially successful in eliciting evidence of janusian and homospatial thinking processes.

The methodology yielded evidence to suggest that janusian and homospatial thinking had occurred, although in many cases the evidence was insufficiently clear to make positive determinations. In regard to janusian thinking, the chief difficulty was determining if opposites were actually perceived simultaneously or sequentially. In regard to homospatial thinking, there was difficulty determining if discrete entities were perceived as fused or just close together and separate.

Two major factors contributed to the difficulty of confirming the use of the two thought processes. First, language seemed to get

in the way. Perhaps it was inappropriate to use a linear medium, such as language, to collect information about a non-sequential process like janusian thinking or a process like homospatial thinking, where entities occupy the same space at the same time. The linear rules of language could interject a sequencing bias on subjects' descriptions of thought processes which are not necessarily linear. Consider, for example, if a person is asked to imagine "swimming," then an ordering and sequencing process starts as the person tries to find a starting point -- "First you need a swimming suit, then you go to the pool," etc. The point being that, in order to communicate clearly to others language needs to be syntactical, but this syntax may misrepresent perceptions which are of a non-sequential nature.

A second difficulty that was encountered in trying to obtain evidence of the two thought processes was that the teachers were only peripherally aware of their thought processes. The teachers were not in the habit of attending to _how_ their thoughts were perceived, they were more concerned with the products and goals of their thinking. Over the course of the study the teachers appeared to become more attuned to the processes. However, at the point where gains from this increased awareness were about to be realized, the study drew to a close.

Positive results obtained by the methodology were due to a combination of techniques. The observations focused on "change" usefully disguised the exact focus of the study, and also provided evidence of teachers' thoughts in making new decisions. Use of the

think aloud technique, and in particular the acknowledgement of "wild ideas," "images," "voices," and "feelings" helped stimulate teachers' descriptions of the information desired by the researcher. Having teachers keep journals was time consuming for them but provided very useful documentation of their ideas which occurred outside of the school setting. Finally, tape-recording teachers' thoughts during the session and replaying this to them later during the interviews, while recording their reactions with a second tape recorder, significantly increased the amount of descriptive detail they could provide.

Implications

The implications of the above discussion are that the techniques utilized in the methodology could usefully be applied in other investigations to gather evidence of teachers' thought processes. However, some modifications in the methodology appear warranted. Some alternative means are needed to more directly access teachers' thoughts and facilitate their verbal and written accounts of them; and, secondly, it is evident that teachers require time to become accustomed to focusing on their thought processes, and may, over time, become better able to access consciously how their thoughts are perceived. This implies that the investigations could have been extended over a longer period of time. However, it was noted in the study that interviewing was very demanding on the teachers' time and energy, and to simply extend the methodology described in this study would have been inappropriate. A different formulation which would

provide the researcher with greater access to the teachers' thinking and concomitantly reduce the teachers' burden is needed.

Recommendations

1. Supplement data gathered through interviews, observations, and written accounts with other forms of representation such as illustrations, models, and other two/three-dimensional representations.

2. At the outset of this type of investigation, help subjects to recognize the difference between linear explanations of their thought and the nature of the actual thought process.

3. When teachers are using language to describe images, encourage full descriptions -- to elaborate about visual and other sensory perceptions as much as they can.

4. Design research projects which are sufficiently long so that benefits may be realized from the subjects' increased awareness of and skill in describing their thought processes.

5. An individual researcher should work with one teacher on a regular basis, perhaps three hours every morning or afternoon, for a period of several months. The researcher should serve as a participant observer and utilize methods described in the study: journals, change-focused observations, the think aloud strategy (modified to include reference to "voices, feelings, and intuitions"), and use of a second tape recorder during the interviews so that the teacher's earlier thoughts may be

replayed on one while recording their thoughts about their thoughts on the other.

Conclusion 2 -- Janusian and Homospatial Elements

The teachers showed evidence of janusian and homospatial thinking although evidence was at times made indistinct by the presence of other thinking processes.

Illustration of this conclusion is provided by examining evidence in two of the cases. Starting with an instance of janusian thinking, Jessie in Example 1, brought together the opposing elements of large and small in the image of the giant and midgets and this offered strong evidence of janusian thinking. Opposites were juxtaposed simultaneously, her description of the midgets and giants together in the same image supported this interpretation. However, in another part of the interview, she said she thought of one extreme in size and then thought of its opposite. This comment suggested more of a sequential perception of the opposites, but may have only been description biased by the linear effect of putting the idea into words. The conclusion drawn was that Jessie had exhibited janusian thinking and that other thoughts of a sequential nature may have occurred at about the same time.

The researcher perceived that an example of homospatial thinking was provided by Alice's conception of the boys as brick walls. Her comments and animated portrayal of their becoming hard brick walls suggested strongly that she saw the boys and brick walls as one. In a

follow-up interview she was fairly certain that she had actually fused the two images, however she allowed that she may have perceived images of boys and the walls in rapid succession. The researcher concluded that both processes may have been operating. It was also noted that the teacher had revivified what for some might be a "dead" metaphor of coming up against a "brick wall." She seemed to revivify the metaphor and bring it "alive" for her, giving her new and useful insights about the behavior of the children she was working with.

The two examples described above illustrate that even the strongest examples of janusian and homospatial thought processes were made somewhat cloudy by the presence of other sequential processes which may have been operating concurrently or in conjunction with janusian and homospatial processes.

Implications

Evidence that the participants of the study used janusian and homospatial thinking implies that these processes may be common to many individuals, and not only to the highly creative artists and scientists described in Rothenberg's (1979) work. If the two processes are commonly used by many individuals who have not reached eminence, as well as those who have, then this would suggest that there are other variables which could account for the qualitative difference between the creative productivity of eminent scientists and artists, and that of others less distinguished. Several possibilities present themselves.

First, the difference might lie in such factors as the tenacity of eminent persons to stick with an idea derived through janusian and homospatial processes; or their ability and opportunity to bring energies, resources, and skills together and elaborate upon these ideas until they reach a point where they can be usefully applied. Also, they may not have other major responsibilities which deter them from their focus. A second possibility is that the highly creative individuals Rothenberg studied were more aware of creative opportunities inherent in the "wild ideas" characteristic of juxtapositions of opposites and fusions of discrete entities. They may have been more inclined to play around with these apparent inconsistencies and to bring them to a production point. A third possibility is that there are levels of janusian and homospatial thinking. In fact the data of this study strongly suggested this. This is addressed as a conclusion later in this chapter.

Recommendations

The principal recommendation that follows from the above observations is to investigate what factors promote and discourage teachers' use of ideas developed through janusian, homospatial, or other thought processes encouraging creative teaching. A second recommendation is to investigate the types of janusian and/or homospatial conceptualizations which are used by teachers that result in innovative and effective teaching, so that they might be shared and used by other teachers.

<u>Conclusion 3 -- Levels of Janusian and Homospatial Thinking</u>

There are levels or degrees of janusian and homospatial thinking.

In the data collected in the study there were varying degrees of janusian and homospatial elements. For janusian thinking there were varying degrees of opposition, juxtaposition, and simultaneity. For homospatial thinking there were varying degrees of fusion or superimposition. In addition, the teachers had varying degrees of conscious awareness of both processes.

It was pointed out earlier that the teachers were unclear in their minds about the janusian aspect of simultaneity. One teacher indicated that so many images came to her in such a short space of time that she could not be totally sure, but it was something close to being simultaneous. The amount of opposition in janusian thinking also varied. The concepts of large and small embodied in the giants and midgets was not <u>the</u> extreme case possible. The teacher could have imagined even bigger giants and miscroscopic midgets.

For homospatial thinking there were instances when degrees of fusion were suggested. Jessie for instance described seeing the clown and the geometric shapes that made it up. She indicated that she felt that she had been looking at the clowns and seeing them together at the same time. However, she talked later of the shapes as having been placed "on top" of the clowns. The fluctuations in the teacher's characterization of her images neither suggested that they were totally fused nor did they suggest that they were totally separate

either. The researcher was left with the impression that there was an "in between" possibility, where a partial fusion was perceived.

In both of the processes, the teachers perceived the aspects of simultaneity and superimposition with varying degrees of conscious awareness. On one level of awareness all instances of janusian and homospatial thinking which were reported in the study were conscious -- as the teachers were all trying to address a particular educational concern. On another level the teachers had varying degrees of awareness of their actual mental processes as opposites were juxtaposed, or entities fused. In those cases where teachers were consciously aware that they were fusing entities or juxtaposing opposites, their ideas were much more powerful and compelling to them. They also gave the impression that these ideas would be more interesting to their students and more useful as well.

Implications

One implication of the above is that levels of creative production might be influenced by the degrees of opposition, juxtaposition, or superimposition present in a thinker's conceptualizations. Furthermore, the thinker's conscious awareness of these processes seems to increase their power and usefulness. It would appear that the highest and most sophisticated manifestations of these thought processes would require full awareness of the processes of juxtaposing opposites and superimposing entities.

Another implication is that the theories of janusian and homospatial thinking need to be extended to account for the varying levels of these processes which are evident. Finally, it would seem that raising teachers' awareness of the janusian and homospatial elements in their thinking would enable these individuals to exceed their current levls of creative activity.

Recommendations

Research efforts should be undertaken to examine and define more closely the levels of these two processes. In addition, until more refined distinctions can be made about the levels or degrees of janusian and homospatial thinking, it would be useful to think of the processes which approximate the ideal in terms of being "janusian-like," or "homospatial-like." Alternatively, it would be useful to broaden the definitions of janusian and homospatial thinking to account for the variations which have been discussed.

A third recommendation is to implement educational programs which would heighten teachers' awareness of janusian and homospatial thinking processes which they may already be using. By raising their awareness of these processes, they may be better able to recognize them and employ them more powerfully in their classrooms.

Conclusion 4 -- Interplay of Janusian and Homospatial Processes

Janusian and homospatial thinking frequently work in conjunction with one another.

In several of the examples both janusian and homospatial elements were in evidence. In some cases they occurred independently, with one later influencing the other. However, in several instances both appeared to be functioning concurrently. There was insufficient evidence to conclude whether janusian thinking occurs before homospatial processes. But the example of the giants and midgets closely paralleled Rothenberg's observations that janusian elements frequently occur first and are later elaborated and modified by homospatial or other processes, such as dialetical thinking.

An implication of this conclusion is that while one process may operate separately from the other both may have important complementary functions in the development of ideas. Therefore any program aimed at encouraging creative production would want to incorporate the training of both processes and not just one or the other.

A recommendation that follows is that a creativity training model which would be developed around Rothenberg's work should include activities to increase awareness and understanding of both processes as they work in combination with each other.

Three Speculations

Janusian thinking and resolution of classroom conflicts. There are probably many different conflicts which teachers encounter in their teaching careers which might lend themselves to creative resolutions through janusian-like juxtapositions of opposing elements.

Discussions with Alice indicated that her comfort level in teaching had increased after recognizing that she could be attached to yet separated from her class. Another such concept was having greater flexibility if she had more structure. Other such juxtapositions of opposing elements can be observed in educational literature. Mitchell (1958) talks of a "permanently tentative" curriculum, Dewey (1902) talks about directing by indirection. Bussis et. al. (1970) indicate that both teachers and students in open education settings contribute to decisions about the curriculum. While none of these conceptualizations may have resulted from janusian thinking, nor were opposites perceived as being equally operative and true; yet each one of these sets of elements (some more opposing than others) may be revivified by an observer and construed in such a way that opposing elements are seen as true and operative simultaneously.

It would be useful to explore further the thought processes of our greatest or most effective educators--teachers, administrators, researchers, and philosophers, to determine how they resolve the conflicts which they perceive in their educational endeavors. Whatever the result of such an investigation, it would shed light upon ways of solving many of the problems our systems are encountering. Janusian thinking might well be one of the prominent processes identified in such a study.

Another useful area of exploration would be to study how teachers resolve conflicts over the course of their educational careers. Understanding the major conflicts which teachers encounter

during their careers and the means by which they address them would have important implications for the kinds of preparatory programs student teachers should have. If janusian processes are employed in these conflict resolutions as was suggested by this study, then helping individuals to consciously manipulate the antithetical or opposing elements within conflicting situations may provide educators with more effective and creative solutions to educational problems.

The empathic homospatial process as a means of understanding students' perspectives. Several times during the course of the study the teachers appeared to place themselves in the position of students as a means of imagining what they might be thinking and feeling at a particular moment. This was especially true in the descriptions Alice gave ("Brick walls," "Stuck in boxes") of the students in her class and the ways that she interacted with them. Her descriptions, and that of an instance in Debby's classroom (Marie in Puerto Rico), were suggestive of what Rothenberg (1984) terms an empathic homospatial process. In an educational setting this would constitute projecting an image of oneself into the spatial location of the student(s) and experiencing their body language, expressions, feelings, and behavior, while still remaining aware of being the teacher.

Recognizing that many of the interactions that teachers have during a day are with students and depend upon a knowledge of what the students think and feel, suggests that utilization of an empathic homospatial process would be valuable to teachers. This researcher would recommend that research be undertaken to determine to what

extent the empathic homospatial process is used by teachers and to what extent it is perceived as a useful tool for teachers to employ.

A speculation about teachers, learners and creativity. To digress one moment, this researcher recently recalled a party students had given him at the end of his first year of elementary school teaching. One activity which the students planned was a skit in which one student played the role of him, the teacher, giving a lesson. Loud bursts of laughter came from all as the student replicated with uncanny accuracy many of this teacher's mannerisms, reprimands, standard phrases, instructional approaches and the like. It was striking to realize just how much this student was able to reflect of the teaching as there had obviously been little time for advance preparation. In reflecting back now about this incident, it seems that learners may be bound up nearly as much in the teaching process as is the teacher. Students imagine themselves in the role of teacher, and this is accomplished through an empathic homospatial process of projecting an image of oneself into the spatial location of another. This is more than thinking what it would be like to be a teacher. They become teachers. Experience tells this researcher that other teachers have had similar experiences and observations.

This story is offered as a counterpoint to the earlier discussion about the teacher as learner. It seems that just as the teacher projects him or herself into the space of the learner to better understand the learner's perspective, the learners in reverse fashion project themselves into the spacial location of the teacher to

better understand the teacher's perspective. This is not necessarily a straightforward operation. For instance, the teacher reflecting on being in a student's space also would recognize the student reflecting on being in the teacher's place--a sort of reflecting on reflections of reflections. In other word, teachers and students probably spend a lot of time thinking about what the other believes the other is thinking about. It is not just thinking about the other person, but thinking about that person's knowledge, feelings and ability to understand the other individual or a given concept.

An illusive image this researcher is struggling to conceive, yet is certain exists, is one of the learner and teacher superimposed or occupying the same spatial location. The roles of each being simultaneously operative, teacher--learner, learner--teacher, neither role compromised, but both are aggrandized into some larger and more effective knowing unity. Koestler might call this a "bisociated holon"; for Rothenberg, a product of concomitantly operating janusian and homospatial processes.

It is important to recognize that the unity is not a static or comfortable one, but rather something which is fluctuating, growing and in a state of "dynamic equilibrium," to use Piagetian terminology. Allusion to this dynamic state is reflected in Jimenez's (1975) reference to the effective teacher's task being one of placing oneself in "... a state of tension between the familiar and the strange" (p. 34). This was also evident in Elbaz's (1981) description of Sarah, the teacher in her study whose cognitive style was perceived to be "...

one in which she deliberately constructed a view of teaching situations which challenged her, which could shake up her existing mode of operating and bring about change and growth. Thus, the tension was, at least in part, a creative tension" (p. 64).

These perspectives underscore the truth in the often heard statement that "The best way to learn something is to teach it." This researcher's observation is that teachers who are faced with the situation of having to learn a subject as they are teaching it find themselves much more sensitive to the learners perspectives -- teaching and learning can be at their best in such situations. In instances where an optimal balance between the teaching and learning aspects of instruction are found, and where time and resources permit, teaching will be as creative as it can be. It is hoped that this study is a step toward identification of how that optimal creative balance might be reached. Others are warmly encouraged to join this effort with their own expeditions.

Summary of the Recommendations

Recommendations for improving the methodology.

1. Supplement data gathered through interviews, observations and written accounts with other forms of representation such as illustrations, models, and other two/three-dimensional respresentations.

2. At the outset of this type of investigation, help subjects to recognize the difference between linear explanations of their thought and the nature of the actual thought process.

3. When teachers are using language to describe images, encourage full descriptions -- to elaborate about visual and other sensory perceptions as much as they can.

4. Design research projects which are sufficiently long so that benefits may be realized from the subjects' increased awareness of, and skill in describing their thought processes.

5. An individual researcher should work with one teacher on a regular basis, perhaps three hours every morning or afternoon for a period of several months. The researcher should serve as a participant observer and utilize methods described in the study: journals, change-focused observation, the think aloud strategy (modified to include reference to "voices, feelings, and intuitions"), and use of a second tape recorder during the interviews so that the teacher's earlier thoughts may be replayed on one while recording his/her thoughts about these thoughts on the other.

Recommendations for future research.

1. Investigate factors which encourage and discourage teachers' development of ideas formed through janusian, homospatial or other processes encouraging creative thinking.

2. Direct research toward identifying and describing levels or degrees of janusian and homospatial processes.

3. Examine the creative thought processes of effective teachers, administrators, and researchers for evidence of janusian and homospatial thinking.

4. Investigate how teachers resolve conflicts encountered at various points along their educational careers.

5. Explore further how teachers employ empathic homospatial processes as a means of understanding students' needs, understandings, and feelings.

6. Investigate specific janusian and homospatial conceptualizations employed by teachers that result in innovative and effective instruction, so that they might be shared and used by other teachers.

7. Examine the effects on teachers' creative behavior of raising their awareness of janusian and homospatial thinking.

Recommendations for using janusian
and homospatial thinking for
educational purposes.

1. In lieu of the formulation of refined distinctions being made about the levels or degrees of janusian and homospatial thinking, it seems useful to think of the processes as being "janusian-like" and "homospatial-like," to recognize the fact that various levels are possible.

2. Develop educational training models which would increase teachers' awareness and understanding of both janusian and homospatial thinking, as a means of promoting more effective and creative teaching.

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APPENDIX A

The Commonwealth of Massachusetts
University of Massachusetts
Amherst 01003

SCHOOL OF EDUCATION

Within the next week I would like to start a pilot study as part of
my research for my dissertation with teachers at _____ School.
The study will focus on teachers' thought processes as they interact
with children during the course of a lesson and make changes in their
teaching activities. I would like you to participate in the study
which will consist of a one (1) hour observation of you in your
classroom and a one (1) hour follow-up interview on the same day.
I would like to talk with you about the possibility of your participation
in this project during the next few days. I'm looking forward to
seeing you soon.

                                        Sincerely,

                                        Gary Soroka

APPENDIX B

The Commonwealth of Massachusetts
University of Massachusetts
Amherst 01003

SCHOOL OF EDUCATION

May 14, 1982

Thank you for letting me observe in your classroom and have the follow up interview with you. I have since had an opportunity to review the tape of our discussion and feel that you would make a valuable contribution to the study. I hope that we could meet sometime during the next week to discuss the possibility of your continued participation.

I wish to emphasize that you are under no obligation to participate and I realize that this is a very busy time of year for you. Your participation will require   some extra time. Below I have outlined what I expect your time commitment would look like.

Step 1 You and I plan for a lesson which you will teach in the coming week. Time required will be about 1 hour.

Step 2 Prior to your teaching of the lesson you will keep a record of your thoughts as you plan for the lesson. You will be asked to either keep a written record of these thoughts or to record them onto a taperecorder. Time required will vary -- I guess that this may take as much as an hour.

Step 3 You teach the lesson; I observe the lesson. This is regular classroom time so that this will require no extra time on your part.

Step 4 We have a follow-up discussion on the same day that you teach your lesson. Time required will be about 1 to 2 hours.

The above sequence will take about three to four hours of your time. However, about half of that time is time that you might ordinarily spend on your teaching preparation anyway. The above sequence of steps would be repeated for a second time so the total time commitment would be about six to eight hours. I would like to go over this in more detail with you and answer any questions which you might have about it as soon as possible so that you can make a decision about participating, and in the event that you do participate we can set up a schedule for the sessions which will suit both of our schedules. I'm looking forward to seeing you soon. I will call or visit you at school by next Wednesday.

Sincerely,

Gary Soroka

APPENDIX C

<u>Written</u> <u>Consent</u> <u>Form</u>

Teachers' Thoughts about Their Thinking as They
Plan, Revise and Implement Learning activities

I, Gary Soroka, am a doctoral candidate in education at the University
of Massachusetts at Amherst. I will soon be conducting the second phase
of my research for my dissertation about teachers' thought processes as they
plan, revise and implement novel learning activities.

You are being asked to participate in this phase of the investigation.
Building upon the information which was collected in the pilot study, I will
be collecting information by interviewing you, reviewing written notes which
you make during planning, and observing the planned learning activities. The
information which is gathered will be anaylzed by the researcher to gain a
better understanding of how teachers think as they plan instructional activities

In the initial part of the study you will be asked to think aloud as you
plan a learning activity which is new to you in some way. I will ask you ask
you to describe your thoughts and will audiotape the planning session. The
tape will be transcribed and analyzed at a later time. This interview will take
from one to two hours.

After the initial interview you will be asked to keep a record of your
thoughts as you continue to plan for the learning activity. You will also
be asked to save any other written notes, plans, doodles, etc. which you
may make in preparing for the learning activity.

In the next phase of the data collection, you will teach the planned activity, and I will be present as an observer. I will keep a written record of the activities and use them in our discussion later to stimulate our memories about the events that took place.

On the same day that the learning activity takes place we will review the plans which you made about the activity since the initial planning session. We will also discuss the events which took place during the implementation of the learning activity. This interview will take from one to two hours, and will be audiotaped and transcribed for later analysis.

The complete sequence of <u>planning interview</u> -- <u>planning</u> -- <u>teach/observation</u> -- <u>post-interview</u>, will be repeated at least one time.

As the population for the study will be small (three to five teachers), complete anonymity for the participants can not be guaranteed. However, in all written materials and oral presentations in which I may use the information collected in the study, I will use neither your name, nor the names of pupils in your class which may be mentioned during the interviews. Please note that the name of the school will be mentioned in both the proposal for the dissertation and the dissertation.

While consenting at this time to participate in this study, you may at any time withdraw from the process.

In signing this form you are agreeing to the use of the collected materials in my dissertation and any journal articles which may be written about the results of the study.

Finally, in signing this form you are stating that no medical treatment will be required by you from the University of Massachusetts should any physical injury result from participation in these interviews and observations.

I, _____ have read the above statement and agree to participate under the conditions stated above.

                                        _____
                                        Signature of the participant

My address during the period in which this research project will take place is:

Gary Soroka
_____
Amherst, Massachusetts 01002
Ph: (413) ___ ____.

APPENDIX D

Directions for recording your thoughts about your thinking as you plan
for your learning activity.

1. It is important to get as complete a picture of your thinking as is possible
    as you engage in your planning. Even thoughts which you have about the
    learining activity when you are not actively planning for it are important
    to record. Please make a note of the time and date when thoughts occur.

2. If you use the tape recodder to record your thoughts, then read through the
    guidelines on the following page and keep them in mind as you describe
    your thinking.

3. If you are not using the tape recorder to make a record of a thought, then
    write it on to a paper. Please save any doodles or any other written
    records which are related to your planning for the learning activity.

4. Your written notes about your plan should include both your actual plan
    and thoughts about your thinking as you make your plans. You should use
    the planning paper which has been provided when it is possible.

5. If you have any further questions please contact me at home or at the
    office.

            Home: _____
            Office: _____

                              Thank you!

Guidelines for tape-recording your thoughts about your thinking:

1. Say whatever is on your mind. Don't hold back hunches, intuitions,
    guesses, wild ideas, images, intentions.

2. Speak as continuously as possible. Say something at least once every
    five seconds, even if only: "I'm drawing a blank."

3. Speak audibly.

4. Speak as telegraphically as you please. Don't worry about complete
    sentences and eloquence.

5. Don't overexplain or justify. Analyze no more than you would normally.

6. Don't elaborate past events. Get into the pattern of saying what you're
    thinking now, not of thinking for a while and then describing your thoughts.

Plans for Learning Activity

Thoughts about Your Thinking:
Say whatever is on your mind.
Don't hold back any hunches,
intuitions, guesses, wild ideas,
images, intentions.

Time when
thoughts
occur

APPENDIX E

JANUSIAN THINKING   REVIEWER:_____

EXAMPLE:_____

If no evidence of janusian thinking was found, check ✓ the box. ☐

If evidence of janusian thinking was found, circle the appropriate code
number to indicate your analysis, and give a brief description in the space
provided. The code numbers have the following meanings:

      0 = No evidence
      1 = Little evidence
      2 = Evident, but not clear
      3 = Clearly evident

A) Antitheses, opposites, contradictions, paradoxes, or   0   1   2   3
    reversals were evident?

    What were the opposing elements?_____

    _____

    _____

B) Opposing elements were simultaneously juxtaposed?   0   1   2   3

    What suggested simultaneity?_____

    _____

    _____

C) Teacher was consciously aware of thought process?   0   1   2   3

    Describe evidence:_____

    _____

    _____

D) An original and useful product, solution, or idea was
    developed by the teacher?   0   1   2   3

    Identify Product:_____

    _____

E) Other comments:

REVIEWER:_____

HOMOSPATIAL THINKING

EXAMPLE: _____

If no evidence of homospatial thinking was found, check ✓ the box. ☐

If evidence of homospatial thinking was found, circle the appropriate code number to indicate your analysis, and give a brief description in the space provided. The code numbers have the following meanings:

    0 = No evidence
    1 = Little evidence
    2 = Evident, but not clear
    3 = Clearly evident

A) Multiple images were evident?   0   1   2   3

    What were the images?_____

    _____

    _____

B) Images were superimposed or fused?   0   1   2   3

    What was fused or superimposed?_____

    _____

    _____

C) Teacher was consciously aware of thought process?   0   1   2   3

    Describe evidence:_____

    _____

    _____

D) An original and useful product, solution, or idea   0   1   2   3
    was developed by the teacher?

    Identify Product:_____

    _____

E) Other comments:

APPENDIX F

EXAMPLE 1.   GIANTS, MIDGETS AND CLOWNS (Jessie)

In this interview the teacher is talking about doing a math activity with the students. She wants to plan an activity that will have graphing and measurement and integrate this with a teaching unit about the circus which is in progress.

T: ...so how am I going to tie those two things together. Now what immediately comes to mind, one way that we could do it, they do a lot of somersaults and jumping and things like that, that's been all free play. We could ask the kids to do the jumping that they have been doing, marking the place where they land and measuring how far they have gone and then as a follow up we could graph how many went two feet, and how many went four feet. That would be one thing that we could do.

Teacher and researcher agree to continue to explore this direction for more ideas.

T: ... It will be math, it will be measuring, and they will measure jumps (teacher writes this down into journal). What else could we measure? Um, (pauses for @ five seconds) we could do tightrope walking. It's the one thing that they have been doing on their own. We'd just structure it a little bit more. See how many footsteps it takes them to go across and then see if they can make the comparison of the people with the bigger feet -- take fewer steps, so we could chart the steps that the kids take and chart them as they go, put up a chart, and see if they make the connection that they are going the same distance but they are taking a different number of steps. Try to get some conversation about that and see if they can figure out why. Um, another thing, could we, could we, (spoken softly)(pause @ five seconds then the teacher starts writing -- does so for about five seconds).

R: What are you thinking right now?

T: Um, I was thinking about measuring, for decorations for the room we could make giants, men on stilts, and midgets and that kind of thing. But I don't think that I want to get into that kind of thing because too few people can work on that at one time to be doing it with the whole group. So I don't think that I will do that.

R: You were having images of you working with the children at that point, doing those sorts of things?

T: Yeah, I was thinking about a giant that we did once where his legs went right up over the door. And the kids would walk between his legs when going in and out of the classroom and they really liked that, and that might be something that I will do, but not as part of this. That's too complicated for the number of kids that would be working on it. I'm trying not to have a lot of kids just standing around watching other kids do things even though when they are doing the jumping and measuring, um,

EXAMPLE 1. (Jessie)

T: (cont'd) you see I can have them sitting on the benches then and that sort of confines them....

The teacher elaborates on the jumping and measuring ideas and talks about the difficulties involved in working with the whole class now that the intern has left. After about ten minutes of planning the researcher replayed an audio recording of the beginning of the planning session and asked the teacher to comment on how she decided on the graphing and measurement idea.

T: That's really hard because I don't know what triggers those things. I guess that I was surveying the things that I try to get to all the time. There were things that I hadn't gotten to in math. We haven't been doing any kind of experimental math, we have been doing the kind of math where, we've been doing paper and pencil , and counting numbers, sequencing and that sort of thing; but the other kind we haven't done, so that I guess came to my mind. How that happened to come instead of something else I don't know. Mmu, the first thing that I mentioned about the classroom management kind of thing, that's what I've been working with for the last two days so that's right there. So you could have said "What are you having for supper tonight?" and I would have said "Classroom management " (laughs). So that, I mean I know where that one came from. It is uppermost in my mind right now. The other one was well you know, here we've got this blank, what are we going to put out there? I don't know if, I don't know what kind of sorting and sifting I did, I can not remember the ideas that I rejected.

R: You know that you rejected some and you sifted through some at the same time.

T: Yeah, but I can't tell you what were the ones -- how I settled on that one. I know that I was thinking about large and small, comparison kinds of things with the giant and the midgets and I think that probably that's more arts and craftsy kind of things that there wouldn't be enough comparisons to make and it didn't seem worthwhile to plan a whole lesson around that....

R: You thought about midgets and giants. So that was one image that came to your mind?

T: Yeah, well large and small. I thought about the giant and then I thought about what would be the opposite of that -- what would be the comparison. Cause that's measurement, and I suppose that we could do sequence (laughs). Now I am no longer thinking about how I was thinking -- other things were coming to my mind -- a sequence making, that might even be a better activity to have the kids go into groups or pairs and make a giant or clown two inches tall and make one six inches tall, make one eight inches and so that when we got finished we would have a clown going all the way up. Now that would be a fun activity (teacher seems intrigued by the idea). We may as well go with the one that we have (going back to the jumping and measuring idea).

R: Well there is nothing holding us to it. What I would also be interested in seeing is how ideas move from one place to another. And you are not at all held to teaching what we discuss today. If you come in tomorrow with something that's totally different that's fine too but I will want to

EXAMPLE 1. (Jessie)

R: (cont'd) find out what changes occurred.

T: So when I, I guess it's , another thing, when I start talking about what
    was I thinking about when I was thinking about the first one I came up with
    another one, just by talking about the things that I reject.

R: Tell me a little more about what you were thinking about just now as that
    idea came in.

T: I was thinking that the giant, or the man on stilts would be more circus-
    like, and the midget would be of just two sizes and that would not be
    enough of a comparison, it would be a fun activity but it really isn't
    getting at what I started out saying the kids needed -- those measurement
    kind of things. It's a different skill, but we have done that a lot --
    big and small, but if there were a range of sizes in between then you could
    get clowns and so it went on to what I said, and that's how it came to that.

R: Tell me about -

T: You saw me solving a problem in one, it created an idea for another.

R: I'm clear on that. I'm wondering what came into your mind at the time
    when that new (thought) came. Were you seeing clowns?

T. I think that I must have been, because it changed from giants to clowns
    without me making that as a conscious decision. Well giants aren't really
    circus. Clowns are circus, and you're now thinking about a giant just
    because you need a giant to be really big, then it could be clowns and they
    could be of any size. So I think I really saw you know this kind of a
    billowy, that kind of a clown suit (makes a rough sketch).

R   And pants?

T: And pants.

R: As you are drawing

T: Right, those the kids could do cause it's
    triangles and circles, and you could give them
    paper for them to measure how much they want.
    So they could be working measurement and also,
    but I think that this is much more to the point, the first one is much more
    to the point of what we originally said the goal for the lesson was going to
    be. This is another good lesson but I said that this was a need and this was
    a need more than this stuff (the clown activity).

R: Ok, it is again -- if you feel that one is more the way that you would like
    to go, that's entirely up to you. I don't want you to feel held to the
    first one because that's where the objective started off. It's not my
    goal to make certain that you stick to your original goal

EXAMPLE 1 (Jessie)

T: On the other hand a certain amount of the planning that happens, that's
    a part of it, because we have district restrictions, not restrictions,
    but obligations. And so a good leal of the planning is saying this is
    what the need is. This would be a lot more fun but you wouldn't need
    to do this one... so when I'm doing planning that's always part of the history
    of it.

R: This will be one last question on the clown idea(which) you brought
    up earlier and that was how did you, at that point, figure that you would
    relate that to your class. Did you -- how did you see bringing that to the
    class?

T: I hadn't gotten to that yet.

R: It was just an idea out there?

T: Yeah, this came the finished product, this that came to me, and I would
    have had to work backwards to how I was going to do it. This one (jumping
    and measuring), what I wanted came first.

R: The math and jumping and measurement?

T: Right, and I build up what, I arrived at a finished product by a process
    of what would come next. This one (clown activity) the product came first
    and I would have had to work backwards.

R: Do you mean that you saw the finished product of the clown idea as that's
    the culminating activity -- that's where your activity would end up?

T: Right.

R: Did you see that as an activity that children had already worked on, that
    children had made these clowns?

T: At that point, probably not. At that point I saw clowns of various sizes
    and then certainly the kids with the measuring, the kids could do the
    measuring, you could assign each group of children to make one. But I really
    saw the finished product and I worked back to if the kids do it, how do they
    do it? Where would the measurement come in? I hadn't gotten to how you
    would present that. This other one (jumping and measuring) came the other
    way around.

On the following morning the lesson was scheduled to be taught however the teacher
decided at the last minute that the class was not ready and she was not ready
for the lesson so she switched to different lesson.

EXAMPLE 2-A. "APPLE CORE ACTIVITY" (Jessie)

INTRODUCTION

In this lesson the teacher is planning an activity designed to help the children in the class become more respectful of each other and the classroom environment. She is reminded of a lesson called the "Apple Core Project" from a magazine. In the interview show below "T" stands for teacher and "R" stands for researcher.

T: I guess that I feel like it's not going to be an easy one to put together. I have this vision of the room filling up with wastepaper and doing one of those days where no one is allowed to pick anything up. I mean you read about them in Learning Magazine and things. Alright you do not need to put things away -- do not put things away.

Later in the interview:

T: (T)here's one activity that I've got tucked away somewhere that we talked about a little bit earlier, you spend a certain length of time where you are not allowed to pick anything up or put anything away, there is no clean up after any activity."

R: Is this one that you thought of and worked with the children before?

T: I have never done it before, but I have read about it, and it's called the Apple Core Project or something like that. I've got it filled away in my science file, and I've never done it because I imagine it's going to be a mess, and the kids are kind of messy to start with, so you can imagine what it will turn out to be. But I think that I will do that one and hope that they will notice (laughing) that it's worse than usual.

R: What was happening when you were thinking about those solutions?

T: When I was thinking of the AppleCore one I was almost seeing kids walking around the room with waste paper up to their calves or their knees or something like that. I was thinking that some of them wouldn't notice that it was there.

R: You saw a specific student that would not notice it or -- ?

T: I saw specific students, I don't know whether they would or would not notice it, but they are the ones that were in my mind most of the day so -- the ones that were most active today needed most of my attention so I think that that's why they're coming specifically to mind now, not because they are any better or worse than the rest....

Later:

T: But , so probably the activity that we'll do on Wednesday will be something to do with that.

R: The Apple Core Activity?

EXAMPLE 2-A. (Jessie)

T: Either that one or one that I thought of before was to talk about our
    responsibility to keeping the community clean for other people and for
    ourselves, and if the weather's nice do a litter bug compaign around the
    school. I'm not really sure that I'm up to doing the Apple core one (laughs).
    That's why I'm still saying that it would be good, but on the other hand
    whether these kids are really old enough to get the irony of it or the
    meaning of it. So probably the one on Wednesday will be an outdoor walk
    with bags to pick up litter around school.

Later in the interview the teacher came back to the idea of the Apple Core activity.

T: Well just that Apple Core thing that I come across every once in a while
    when I'm cleaning out the files. And I keep looking at it and thinking
    that it would be a great thing to do but I keep putting it away and I'm
    not sure why I keep putting it away, except that I think that it's just
    -- for one thing I don't know if my kids are old enough really to appreciate
    it and for the other one , it really takes cooperation. I would have to
    check it out with (the principal) and then make sure that the janitors
    didn't come in to clean and then there would be the cleaning up at the end
    of it. This is the morning kind of thing to think about not an afternoon
    kind of thing; seems like it would take up too much energy but the idea
    keeps coming back and I haven't tried it yet.

R: ...I notice that you were smiling when talk about that, and I was wondering
    what it is about that?

T: Um, just cause it's such a graphic way of showing them what happens if they
    don't do it. The idea of it is that you start out in the morning saying
    "Ok there will be no cleaning up, no waste baskets ." They have a commercial
    now where they throw the bones out, when they eat in the living room and they
    say "You wouldn't do it in your house so why do you do it outside?" kind of
    of thing.   Um, I'm not sure that this particular class has the control not to
    get so carried away with it that it would be unbearable.

R: What does that unbearable part look like, do you have a vision of this?

T: Their level of excitement -- this may not be the class to do it with, that
    they may get too hyper about it and loose the essence of it just by being
    unable to manage themselves and so I'm questioning whether to put them into
    a position where they will not be able to manage themselves. It's not really
    fair to them, and I can see that this kind of thing could get to be too exciting
    and that's not really fair to put them in that position, then expect them to
    maintain a level of behavior that I know before I start they may not be able
    to -- and so that will take a lot of thought on my part to decide whether or
    not I can structure in in such a way to do it without them losing control
    and have it be positive for them as well as for me. I'm not making that
    decision today.

End of discussion on this topic for the day.

EXAMPLE 2-3. SOAP SUDS FANTASY (Jessie)

INTRODUCTION
On the day that the teacher was to present her lesson on being respectful
to others in the class and the environment the teacher indicated in her
journal that she had a fantasy. The teacher's journal entry is shown below
followed by the discussion she had with the researcher later in the day.

Learning Activity   Thought about Thinking

Wed morning in bed -- Talk about one way of
be good citizen - Keep environment
neat -- make two lists -- things dropped   Mind wandered into fantasy of
inside -- outside -- two teams --   of people dropping soda and stuff
(aide) and I -- take walk   and rain coming down and filling
                                                world with foam.

R: I was interested in the one point where you were talking about the part
    about being a good citizen. I think that this was the section that you
    were talking about while you were in bed on Wednesday morning. That was
    the first thing that you thought of?

T: Ah that was before I got up. Um, it may not have been the first thing, but
    it was in the process of waking up in the morning and saying that I can't get
    up today. And then, "What is it today?" "Gary is coming in this is what
    I'm doing." And I had kind of purposely put off really writing the list
    out, partly because my natural way to do it would be to plan the week kind
    of grossly and then I usually get in around seven thirty, sit down and write
    it out then, and so in the morning before I get up I usually go over what
    meetings I have and if there are any things that are left over to do
    like the morning meeting and that lesson, I sort of go over it then, then
    it's gone again until I get into school and sit down and block it out.
    So that was, (pause) and then I don't know whether I went back to sleep
    and dreamt this, I'm pretty sure I didn't but (spoken haltingly)--

R: That's what part?

T: About people dropping, then I sort of, sort of, went off into this fantasy
    of people dropping, what? What kind of things do people drop on the ground
    and then all of a sudden I had them dropping all this soap and stuff on the
    ground and the rains came down and the whole thing foamed up and then I
    thought I'm going to have to write this down (laughing) but I really didn't
    wish to do it. Yeah I went off on a tangent and it didn't really have
    anything to do with the lesson at all, but it was kind of fun to think about.

EXAMPLE 2-3. SOAP SUDS FANTASY (Jessie)

INTRODUCTION
On the day that the teacher was to present her lesson on being respectful
to others in the class and the environment the teacher indicated in her
journal that she had a fantasy. The teacher's journal entry is shown below
followed by the discussion she had with the researcher later in the day.

Learning Activity	Thought about Thinking
Wed morning in bed -- Talk about one way of be good citizen - Keep environment neat -- make two lists -- things dropped inside -- outside -- two teams -- (aide) and I -- take walk	Mind wandered into fantasy of of people dropping soda and stuff and rain coming down and filling world with foam.

R: I was interested in the one point where you were talking about the part
about being a good citizen. I think that this was the section that you
were talking about while you were in bed on Wednesday morning. That was
the first thing that you thought of?

T: Ah that was before I got up. Um, it may not have been the first thing, but
it was in the process of waking up in the morning and saying that I can't get
up today. And then, "What is it today?" "Gary is coming in this is what
I'm doing." And I had kind of puroosely put off really writing the list
out, partly because my natural way to do it would be to plan the week kind
of grossly and then I usually get in around seven thirty, sit down and write
it out then, and so in the morning before I get up I usually go over what
meetings I have and if there are any things that are left over to do
like the morning meeting and that lesson, I sort of go over it then, then
it's gone again until I get into school and sit down and block it out.
So that was, (pause) and then I don't know whether I went back to sleep
and dreamot this, I'm pretty sure I didn't but (spoken haltingly)--

R: That's what part?

T: About people dropping, then I sort of, sort of, went off into this fantasy
of people dropping, what? What kind of things do people drop on the ground
and then all of a sudden I had them dropoing all this soap and stuff on the
ground and the rains came down and the whole thing foamed up and then I
thought I'm going to have to write this down (laughing) but I really didn't
wish to do it. Yeah I went off on a tangent and it didn't really have
anything to do with the lesson at all, but it was kind of fun to think about.

EXAMPLE 2-B.   (Jessie)

R: Do you think that it had anything to do with the fact that you were
     going to do part of the lesson outside?

T: Well I was thinking about those kinds of things, yeah it came from that
     thinking about the kinds of things that people drop outside and what if
     they dropped this and what if they dropped that and I just sort of went on.

R: If you can elaborate a little bit more about that, that would be --

T: That was really all there was to it. One thing led to another, instead of
     disciplining my thinking into what I was going to do for the day I let
     it wander off into --

R: Who were the people that were dropping things, were they people that you
     knew, or were -- ?

T: No, they were just ah, ah, the only vision that I have left from it was the
     rain coming down and these great mounds of suds coming up, sort of
     enveloping everything.

R: Were you there in the picture at all or were you there as an observer?

T: I think that I was probably there, I was there surrounded by soap suds;
     but as I say, you know it was the morning kind of, I was still in bed
     kind of thing. So that was that. I should be keeping a diary.

For the lesson which followed later that morning the teacher grouped the
children into two groups (one inside, one outside) and had the children go on
a litter hunt with one goal being to make a comparison of the kinds of litter
found in the two different places.

Example 3. Marie in Puerto Rico (Debby)

<u>INTRODUCTION</u>

In this example there are two interview excerpts. In the first excerpt the teacher is meeting with a student and her mother to plan a presentation about the Puerto Rican culture. The teacher is trying to get the student to tell her some things that other students in the class would want to know about Puerto Rico.

In the second excerpt the researcher is asking the teacher to descirbe what she was thinking as she was working with the child when they were meeting. A tapereording was used to stimulate the teacher's memory of the discussion.

T = Teacher, M = Marie, R =researcher

<u>INTERVIEW EXCERPTS</u>

T: So what do you think? What can we plan?

    (Seven second pause)

M: I don't know.

T: Well think of it this way, **think** of it being, ah you're in Puerto Rico, and
    you're in your classroom, we got two kids who just came from Massachusetts.
    What are some of the questions that you would ask them? What would you want
    to know about? In one of those poems that you talked about what was the first
    thing that was so amazing . You tell me.

M: Snow.

T: Yeah, the weather. The weather is very different.

M: Very, very, very.

<u>NOTE</u>

Later that afternoon in an interview with the researcher the teacher listened to
a tapereording of the excerpt shown above. The interview is excerpted below:

T: And at this point I was thinking of a school I had seen, it must have been
    St. Thomas, and the feeling that I had when I saw the school: "Oh these poor
    kids." You know the windows were boarded up because of the heat. It was
    just like a warehouse. And I was picturing myself at that time, I had the
    feeling of (pause) you know I thought that I might want to teach there. So
    when she said, er, when I said to her picture yourself in your classroom, I
    was really picturing Marie in this building that I knew was a school.

R: In Puerto Rico?

T: I don't think that it was Puerto Rico, I think it was St. Thomas, I'm pretty
    sure that it was St. Thomas that I was looking at.

R: Mmm hu, so you had that vision --

Example 3 (Debby)

T: And then the whole feeling was, ah Marie, she won't be able to come up;
I immediately made a value judgement as to what her schooling was like and
that she wouldn't be able to even address the questions of "what if another --?"
Because I had pictured her class having very many kids wno weren't native
Puerto Ricans. So I sort of made a value judgement, in a way dismissed
almost a little bit what she was going to say next in my head.

R: When were you aware of that? Were you aware of that after it --?

T: When I asked, as I was asking the question, and then I stopped and I was
listening to her at that point. (sigh)

R: What was the point that was being made here? That...you were asking her to
imagine _?

T: I was trying to put her in the situation of you're the kid who came into
the new school. Picture yourself at the comfort level of being in the old
school. You weren't the odd one, you weren't the strange one. Picture two of our
kids walking into your classroom and you've never been to America -- what
would you like to ask them? I was trying to get her to think of the question
that she would ask, that these kids would ask. They would be the same questions.

R: Ok, so you wanted her to take the place of someone coming from outside, in to
a place and explain from --

T: I wanted her to take, no, I wanted her to take the place of being the one who
was there and experiencing new people coming to her.

R: And what they would like to know?

T: What she would want to know about them.

R: Okay, how did this idea come to you? Was this related back to that school in
St. Thomas?

T: No it was just the whole thing about concrete vs abstract and always trying to
get the kid -- by myself recognizing the fact that I've gone -- I've skipped
a level to bring it back to the concrete. You know, and I thought if I
could put her in a situation of "What would you want to know from somebody
else, it would be more concrete and more easy for her to answer it.

R: Okay, so you were trying deliberately, were you thinking I've got to make this
more concrete?

T: Mm hu.

R: ... I'm wondering how you picked this particular example...?

T: It was just parallel to this situation, I'm asking her what these kids are going
to want to know. She doesn't know, so I'm saying put yourself in their shoes
and what would you want to know if you were the kids. It would be the same
thing.

Example 3   (Debby)

R: Did you see her in the reversed role when you were asking that question?

T: Yeah.

R: Did you see that before or after?

T: When she stopped, I guess as I was asking the question I stopped, I saw her and then she was talking to me, I saw her in the classroom.

NOTE: A little later the teacher describes what she remembered about the poem which was mentioned in the first excerpt.

T: [I remember] Marie writing about it and the interaction between her and myself at that time and I pictured her getting off the plane in Boston and seeing the snow and looking at the amazement on her face.

R: You knew that because you talked to her before.

T: Mm hu, it came up in a poem we did.

END OF INTERVIEW EXCERPT

EXAMPLE 4. BRICK WALLS   (Alice)

INTRODUCTION

The teacher describes in this interview excerpt how she worked through a
problem with two students who had misinterpreted the assignment. They
were supposed to have created an advertisement for an original product that
they had "invented." Names have been changed for reasons of confidentiality

T = Teacher, R = Researcher

INTERVIEW EXCERPT

T: There was a difficult time with Don and Simon. Simon was the kid who
wanted, who did a Trans Am. He didn't want to do it - was not interested
in doing his commercial and so they decided that they would do Don's.
But Don apparently...had designed Coca Cola knowing not taking responsibility
for inventing it -- just designing the packaging and the advertisement for
it. The way that I understood the assignment was that they were to invent
a product and Don hadn't. And I felt really in a bind because he said
"Well the [art teacher] has seen it many times during the week and she
has never said anything about "It needs to be an original product "

Since she wasn't here and couldn't be reached because she doesn't work here
on Wednesday I didn't know what she said to him. I don't know what went
on between them. I don't know if she decided, you know, he's alright doing
what he is, but yet (I) didn't want him doing a commercial for Coca Cola.
And so I felt really in a bind and decided to convince Don that either he
was going to invent a new product. Well that was my first -- well that
wasn't the assignment so let's think of a new product that you were going
to -- and he wasn't interested in that at all, and I felt sympathetic to
it because he had obviously put a lot of work in. Today is Wednesday and
and they had been working on it since last Tuesday. So somewhere along
the line the message of what the assignment was and he didn't connect, and
I felt badly about it, because obviously it was someone else's responsibility
and now to say to him by tomorrow you need a new product, a new advertisement
and a commercial for it. So what I finally did was suggest that he can
use the Coca Cola product but needed to have a new twist on it so they had
to have a little bit of Don and me in the Coca Cola product. He wasn't
particularly thrilled with that because he remembered the art teacher
saying that he couldn't use something new and change it which gave me
reason to think that he knew that he couldn't use something original--
that was original and change it. So I asked him to give it some thought
and as I walked away I was really puzzled because the two of them are
extremely stubborn, and I didn't quite know how I was going to approach it
I wasn't sure whether I was going to stand firm and say "well that's the
breaks that's not the assignment and you're going to have to do something
else and I will help you with that" or whether I was going to bend and
say well since you had worked on it and nobody had talked to you about
changing it you'll need to make an original commercial for Coca Cola "

So that's what was going on in my mind when I walked away   I told them that

EXAMPLE 4. (Alice)   Page 2

T: (cont'd) I would be back and checking in with them in five minutes
or so, and they ought to think that through. I probably did that as
much to give them some time to save themselves as much as to give me
some time to think what my next steps would be. Particularly with
those kids who are so stubborn, I need to be sure not to push them up
against a wall with "Well what are you going to do?" I really wanted to
give them time to come back and say we changed our minds so that they
could feel that the decision was their's. So as I walked away, oh,
when I came back they said forget the Coca Cola--we have a brand new
idea. We are inventing robots and the robots are going to do this
and this and this. And one of the robots is going to drink the can
of Coca Cola that Don invented because he worked so hard. So clearly
it was important that they used that. They said that the commercial
was going to be a silly commercial because it was going to be an
advertisement for a bad product. They were going to do the commercial
so that none of the things that they said the product was going to do
were going to work. I felt that was their way, knowing these two guys,--
I know that you don't want me to give you a history. Should I stop?

R: Go on.

T: That was their way of saying we are going to play by the rules but
not totally. That's where these two are, and I can respect them for
it. As long as it is in the widest range, it's not a traditional
commercial. Commercials work when they are on TV. But I can accept
that because that's the statement that they very often make to me.
"Alright, we'll meet you half way, but we're not selling out." So
that's what that came to. That's the way they operate.

R: When you were thinking that through, I'd like you to think about
any processing that was going on in your mind about your thinking
process itself. What was happening in your mind, not specifically the
ideas for the things that you were thinking about, but the way that
you were thinking about them. Any feelings that you were having during
that time and what those feelings may have felt like.

T: The feelings is easier for me to answer, although I know what you are
asking and I would really need to think about it. I know what you're
looking for I think. The prime feeling that I was going through with
those two guys was I don't want to put either of us up against the wall
I have seen many adults interacting with those two children in that way,
and I don't want anybody to lose.

R: When you say that you didn't want to put anybody up against a wall
what did that, ah, how did that come to your mind? As a series of
thoughts, or were their any images that you were thinking about?

T: I think that if I could play that one out it would have looked like
um, I think that they were images, and I think it was of --this is
not going to come out very clearly on the tape recorder (She starts
motioning with her hands--then folds them in front of her)--of Simon
sitting with his arms folded, his body pulling back in his chair,
saying "I'm not doing it." And Don putting his head down with his

EXAMPLE 4. (Alice)

T: (con'd) hat down saying "Un Unh." "I'm not." They don't budge--
that's it, and I don't like to put them there. They don't like
to be there, and we all feel helpless there. I'm not going to make
them do it. You know that I'm not going to punish them for not
doing it. They get stuck, and I see it. It's very clear to me,
and I talk to them about it. It's very visual for me I think.

I talk to them about them putting themselves in a box, and they
can't get out. I talk to them about how both of them separately
often talk to them about how both of them stand like a brick wall
and sometimes things charge up against them because they stand so
strong that things bounce off. But sometimes things come up against
them that are very strong and will break them. That's the way that
I see those guys interacting, and I see tremendous growth in them as
I describe it to them. They are starting to bend a little bit, and
they are choosing the time to bend. I talk to them about bending in
the wind and bending when the time seems right. I talk to them about
how that flexibility is going to let them take advantage of so many
more things and not be that brick wall that locks out and block.
I talk with them alot about that.

I talk with the kids alot in pictures that way, because that's the
way that I do think. When there is alot of energy in the room that's
very negative verbally, and I just see it, and I could touch it. I
talk with interns about it. You've got to be able to start feeling
it before it's too late, before someone's really in trouble. I could
walk into a room and see it in terms of the room design. I could see
what papers are on the floor. I could see (pause) watching the kids'
movements how large they are, how small they are, the tone of the voices
and could sense that there are kids that are in trouble that are losing it.
It's the job of an adult to get some control of what's happening. I
talk to them about it sounding like waves crashing and how one wave
crashes into another, and it gets larger and the sound gets larger,
and soon, and they see it--they see it. We talk about it, and we
talk about the difference walking into a place we're feeling calm
waves that are still moving but very calm. They don't smack into
each other, but when a wave smacks into a rock the effect that it has--
So, we talk alot about that in terms of pictures.

R: Um,Hm.

T: I think about those things. I see those things very clearly that way
I could see a kid drowning. I could feel it, and it's not really in
terms of thoughts. Initially it's in terms of the child walking into
quicksand.

R: How does that actually play itself out in your mind?

T: Well when I share it, very often I share it that way. I talk to them
about someone---they're just pushing, pushing, pushing--I show it to
them with a pencil. I show them the pencil breaking when it's too much
for Brenda to take, because she just can't take it anymore. They've
pushed too hard. I also realize that some of them, and I can watch
it in their faces, some of them know exactly what I'm talking about

EXAMPLE 4. (Alice)

T: (cont'd) and some of them have no idea at all. They just don't
    organize information that way. It's like "un unh, she's pushing
    that pencil" but they can't relate to it at all.

EXAMPLE 5. IAN CAN'T DECIDE WHAT TO WRITE (Alice)

INTRODUCTION

This section of the interview focuses on the way that the teacher interacted
with a student who was crying during the writing activity that was assigned.
Names have been changed for reasons of confidentiality.

R = Researcher, T = Teacher

INTERVIEW EXCERPT

R: ...There was one incident that happened in the room that I would like to
    have more information about, and that was the boy in the blue shirt who was
    crying after the lesson had started--he went through it for about two or
    three minutes, and I noticed that you went over and you were talking with
    him and at that point I noticed that he was crying. I didn't notice when he
    had started crying. I'm wondering if you can--give a little of the background
    about that situation and any of the images, wild ideas, intentions that you
    may have had, will guesses, voices you were hearing, as you worked through
    whatever that situation was.

T: Ian likes to write on his own terms; he's extremely creative, extremely
    bright, wonderful imagination, but he doesn't like imposed writing assignemnts.
    And Andy has the same reaction; he sits there, showing me that he's trying,
    hoping that he--he told me this (laugh)--hoping that I'll just leave him
    alone and forget about it. And he cries. I think he cries a little bit
    out of frustration, but more so because he doesn't want to do it. He cries
    because he knows that he still has to do it. My initial upset was, "oh, no".
    In this kind of setting, Andy is really hooked into her story with him
    (clears throat)--Ian. Okay. Things are really coming fast." Okay. So
    I moved Andy over there, and that's not really important. Moved Andy--
    okay, just switch it around. Two things are coming-- the two clearest
    things for Ian: he said,"I just don't know; I just don't know what comes next.
    I just don't know." I heard myself saying to (my husband), "I know you don't
    know. That's what you decide!"(laugh) "Decide. It's not--there is no
    right answer! Decide." And I could hear--(my husband) and I have had that
    conversation. We've had--

R: (your husband)?

T: My husband. About jobs that he wanted to take or didn't want to take,
    situations. He said, "I just don't know." And I'd say, "Yeah, I know.
    But 'don't know' means that there's an answer--not really a right answer.
    You just have to decide to decide." And I know that it was (my husband)
    that I was seeing-- he and I. I heard us, and it was (my husband)-- but
    I was talking to Ian. So that was very, very clear. Very, very clear.
    It was the same answer that (my husband) would have: "But I don't know."
    (laugh) The other thing that I know I heard-- I saw Ian's mouth move, and
    I heard--I would start it again; I read the story to him again. And I said
    "You come downstairs and what was it that you saw? Just close your eyes
    and tell me, what did you see when you came downstairs? Was it something for
    you? Was it something for the family?" And I know when I heard and I saw

EXAMPLE 5. (Alice)

T: (cont'd) him give me an answer--his mouth decided. He didn't. But
that was what I was--I was so anticipating it--I don't think I heard a
specific word, but he said something and I said"There you go! Now.
Okay, you--." And he didn't . Until the end when he said, "It was a
ticket to Disneyland" or "Disney World," or whatever. But by then, it was--
I had heard him say and answer a lot of times. There were probably three
times I heard him-- I said, "Of what?" "No, no, no"-- "And"-- and I
heard him say, "It was a bike." But I didn't hear him say that. I don't
think that I heard him say anything specific. But he said something, and
I felt relieved. That's what happened. But, it didn't haopen for quite a
while.

R: At that point you were still having feelings that you were talking to (your
husband)?

T: No. And I particularly dropped that line of discussion because I said,
"Well, what do you think?" and he said, "I don't know." And I said,
"It's okay not to know. Decide. It's not the last time--"--I said, "It's not
the only story you will ever write. And it's not-- you can redecide
something else tomorrow or decide something else later." But that was a
conversation from (my husband) and that's when I decided to drop those
entire words. Because this was getting us nowhere--Ian couldn't do what
(my husband) used to it, and I'm (laugh) still saying, "just decide! I...
what!" I said, "you do whatever you want. It's up to you. You don't
even have to be happy with it. That's your--decide." And you could say,
"That wasn't a good thing." As I said to him. But it wasn't helping--
(my husband). And so, that's when I sort of gave him some oossibilities
to choose from.

End of interview excerpt.

EXAMPLE 6. COFFEE CUP CLASSROOM (Alice)

INTRODUCTION

During this interview segment the teacher talks about some general images
and metaphors that she uses in planning and interacting with students.

The teacher has said that she has found ways to remain calm and reasonable
in setting that could have been upsetting. This excerpt begins with the
researcher commenting that the teacher has had experience dealing with
difficult situations.

R = Researcher, T = Teacher

INTERVIEW EXCERPT

R: You--you'd been there before and you knew how to handle that?

T: Yup. And been--and they've been there before. So--but I'm really--I work
in those kinds of situations not to put them up against a wall and not to
put me up against a wall. And that's a very clear image for me of a child
who just--a teacher--'cause I see it so often, the interns, who literally
are up against the wall and have used all their tricks! It's extremely
visual to me, of--you know, you just sort of keep pulling things out
of your sleeve. "Well, we'll try this; well, we'll try that." And the
teacher who has three tricks uses them in five minutes and then is empty.
And so, what makes me feel calm and confident about it is that I feel I
have lots of tricks, endless possibilities, and so do they.

R: How do you make that an endless set of possibilities? What--

T: Some of it comes from experience and so I've done some of those things
before. But I think a lot of it comes from attitude in that I feel pretty
open, I think pretty openly. So if they say, "I got a great idea; what
if we do it with blocks!", because they love blocks, it's like, "yeah,
that's fine." So I don't feel limited in, "well, I really had it in mind
you doing it with straws and clay because that's what I pulled out, so
you better get into it." And so those tricks are like--three-quarters of
them I haven't thought of yet. But I know they're viable choices. And
that's what makes it, you know-- And that's what really has, I found,
a change in teaching over the years. As a beginning teacher, I didn't
have those and I was too threatened to say, "Yeah, you know, that makes
sense" and picture, well, I really wanted them to do something with
perspective; I wanted them to do something with scale. "Yeah, that does
it. That sounds cool." So the more broad my perspective could be, the
more room I can give them and challenge them to broaden their perspective.
Don't only think of it the way you did it last year; there's a million
other possibilities. And that gives me and them a lot of freedom because
we're not going to lose.

R: When your--you were describing a while ago the feeling about being up
against a wall. Would you talk a little bit about when you may have

EXAMPLE 6. (Alice)   Page 2

R: (cont.) experienced that? Have you experienced that recently? And what--
     what does that feel like, being up against a wall? Or what--or how does
     it look to be up against a wall, when you--you were describing that, "against
     the wall"? Do you see somebody actually--you said it's very clear. I'm
     wondering. Do you actually see a wall, like in a classroom, someone up
     against the wall?

T: It's more like--um, the image is more of--the way I described it to a
     child who I had seen dealing with things that way--we were sitting out in
     the hall. And he was up against the wall. When somebody does something to
     him, he doesn't have choices in the way to react. He has to (slapping
     sound) because he doesn't know what else to do. And that's what I was
     reflecting back to him. You're stuck. And I said -- you're out in the
     hall--wall which is all grey boxes like this.

R: Mm-hmm. Okay.

T: And I said, what happens is, this is all of us, all of these things. These
     are all the possibilities that you have. What happens to you is--what
     looks like happens to you is you get stuck in this box. And when something
     happens you've only one way to react because this is the only choice you
     have. You can't--you don't look at this situation and say, "well, I
     could talk to this child; I could hit this child; I could scream at this
     child; I could go tell the teacher; I could walk away." You're seeing
     yourself stuck; you're on empty. This is your--the only room you have to
     move. So I guess I see it more, I feel it more, like a boxed in. Instead
     of seeing sort of endless--I could do this, I could do that, I could do
     all of these things. It's "I don't have any choices, and when I don't have
     any choices, I can't move. I got stuck."

R: --in that box, and you're--

T: --stuck! You just can't--you can't find your way out. You don't even
     know you need to find your way out. When this happens, you go to this
     box. When this happens, you go to this box. When this happens, you go
     to this box. Instead of just like looking at it all, saying "I can do
     any number of things". And I talked to the kid--and I think about-- I
     was trying to explain to [the principal, he]and I were talking about how I
     feel about teaching this year, and this and that. And I was sitting at
     his desk and I was talking about my coffee cup. And I said, "I used to
     look at teaching sort of like this." And I held the cup very close to
     me so I could (say), "Yeah, things are fine; well, there's this problem--"
     but it's very, very close to me. And so everything was very--I was feeling
     very sensitive about things and couldn't get enough perspective, that
     wasn't ...   coming up in my mind all the time. Instead of feeling like
     now, I could put it here and move it away from me. Still, it's part of
     me, but move it away from me and look at it from all different angles.

R: What is the coffee cup?

T: The coffee cup is everything that is going on--the kids, situations,
     pressures--and I used to keep them very, very close and deal with them

EXAMPLE 6. (Alice)

T: (cont.) very, very close. So there was very little room for me. But as
    I could look at it, I could look at it from this perspective; I could
    look at it from the top perspective, the bottom perspective, turn it
    around and decide I don't want to deal with it at all. But I feel like I
    have lots of choices and I want to give the kids that. And that's what
    the whole thing about freedom is to me is having lots of things I could
    do. And so, I feel very relaxed about teaching now because if this
    doesn't work, something else will. And so I see--and I feel that for
    the kids, too, that there are a lot of different ways they could reach the
    same goals, lots of different ways they could interact. And what we'll
    do sometimes when we have a problem out on the playground--we'll bring it
    in. We'll ask them to role-play it. Play it out again; we're all going
    to be producers and directors. You play it out, and when I say "stop the
    camera", you stop. And so they start and I say "stop". Okay. What's
    did so-and-so do right now? Who's got an idea about what line he should
    say now? And they start brainstorming it. Okay, let's try it. And be-
    cause that child has changed what he said, automatically the other child
    changes what he does! And watch--the kids watch and I watch the power
    they have, and the choices they have. And they start using that kind of
    language so that they're always laughing and joking about--"And then
    here comes [the teacher]well, on the other hand!"

R: (laugh)

T: Because that's the way it is. There's always another side and another
    hand and another possibility. And that's what makes the fun--and that's,
    you know, that's what makes it all worthwhile, because I don't feel
    threatened.

R: When you interact with the children in those situations, does this image
    of the boxes come to you at that time?

T: Yes.

R: (laugh) It does.

T: Yes. And then there's all sorts of images that come. Some I find work
    very clearly for them.

R: Would you tell me about some of those?

T: Um--I tell them about--and then the ones that were clear, of course, I
    use again and again. There's one--there's one that I'll tell them--we'll
    be talking about--about giving clear messages to people about things that
    are going on. And so, I--talking to them, and I step on the child's foot
    that's sitting next to me and I step on it harder and harder, and some of
    them react in all different ways. Some of them won't say anything; some
    will say, "excuse me". Some will, like, [teacher] , will you get off my
    foot!?!" And I'll tell them the story, make up the story about sitting
    at a restaurant and stepping on somebody's foot thinking it was the base
    of the table. And if they don't tell me that I'm stepping on their foot,
    I don't know--I don't even know I'm doing anything wrong. And sometimes
    it's just that innocent. You don't know you hit somebody; you don't know
    you insulted somebody. Unless somebody says, "excuse me, you're on my

EXAMPLE 6. (Alice)   Page 4

T: (cont.) foot, and then that's the end of it. But if they sort of wait and
      don't say anything, just keep getting angrier and angrier, and then turn
      around and scream at me or slug me, it comes out of nowhere. It's not a
      clear message. It's not--and so we gave them this whole thing about the
      power to change things and you wait until it gets out of hand, or do you
      do it right then and there? And then we role-play, you know, what happens
      when you wait? What does that do to me? What is my reaction going to be
      as opposed to just saying "excuse me, you're on my foot" and I go "ooh,
      I'm sorry" and that's the end of it? So we do lots--lots of those things.
      And particularly with an age group that's so broad, because I work with
      six-to-eleven year olds. There are some images that I know are crystal
      clear to some. I can watch them as they shake their heads. I can watch
      them and their eyes are like, "yup, I know what you're talking about".
      And some just can't--can't, either conceptualize it or the image that I've
      got in my mind is not one that's there for them. But they talk about it.
      They talk about, you know, "oh, yeah", and they use lots of metaphors to
      describe how they feel when certain things happen. And again, they work
      for some and some shake their heads and some have no idea what they're
      talking about. But I think it's real important to do those kinds of
      things and to try different ways of approaching it. So if the box doesn't
      work for some, something else will work for another. You know, and I
      think I told you last time about the pencil breaking.

R: Right.

T: You know, for many of the kids that was very, very clear because they
      had felt that. Another one we talk about is--'cause this is--and I have
      to work from what's very clear to me. And I use that until I get a message
      from them that it's not clear to them. And then sometimes they will give
      me ideas that are clearer. But we talk about, you know, there are days and
      situations that create a lot of tension in the room. I'll bring them all
      together and we --we talked about it a long time ago. Now all we have to
      do is refer to it--about an energy in the room being like water. And when
      the water is calm, how it feels. And they can close their eyes and they
      can feel it, how it just sort of flows along and all the waters, all the
      different energies the waters can flow together. And there are things that
      come along; there are branches that fall into it. But the water keeps
      flowing. And then we talk about situations and days that the energy--the
      waters are crashing waves, how they crash into each other and then the next
      wave crashes in and how that starts a chain-reaction. And so we can refer
      to our waves and how the water is going. And we can talk about--I mean,
      there are times, like, see them, what the day is like, when they're picking
      at each other and complaining. And then we all get together to talk
      about it, I can see it in their hands with their fists clenched and their
      backs-- And I try to help them become aware of that. Open their hands.
      Open, feel the difference, and talk about how different that feels, and
      how quickly bad energy spreads. You know, we can do it around the room,
      you know, I knock into you but you don't want to knock into me because you
      know I'm going to beat you up at recess and you go smash somebody else
      and that person steals somebody else's pencil and then all of a sudden,
      everybody's all sort of bent out of shape. So. We talk about that stuff,
      yeah.

      END OF EXCERPT