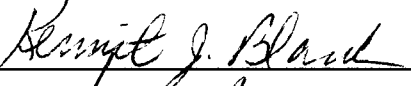
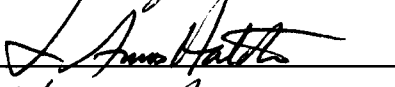


To the Graduate Council:

I am submitting herewith a dissertation written by James K. Horn entitled "The Emergence of Meaning in an Interdisciplinary Learning Environment: A Qualitative Study of the James R. Stokely Institute for Liberal Arts Education." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.


Karl Jost, Major Advisor

We have read this dissertation
and recommend its acceptance:


Accepted for the Council:


Associate Vice Chancellor and
Dean of the Graduate School

THE EMERGENCE OF MEANING
IN AN INTERDISCIPLINARY LEARNING ENVIRONMENT:
A QUALITATIVE STUDY OF THE JAMES R. STOKELY
INSTITUTE FOR LIBERAL ARTS EDUCATION

A Dissertaton
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

James K. Horn
December, 1995

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DEDICATION

To our continuing co-ontogeny

ACKNOWLEDGEMENTS

In 1988 I was fortunate to be chosen as a Stokely Fellow. I wish to thank Lynn Champion for that choice and for eventually entrusting me with the responsibility for studying the Stokely experience.

Further, I wish to express my indebtedness to my Doctoral Committee: Karl Jost, Kermit Blank, Amos Hatch, and Howard Pollio. Without their inordinate patience and appreciation for adventure, this project would not have reached its present state.

I wish to thank my mentor and friend, Bob Howard, whose intellectual enthusiasms have inspired me. My appreciation is extended, too, to Ron Taylor and Peggy Lingle.

Lastly, I wish to thank the twenty former Fellows whose participation in this study I have attempted to acknowledge by preserving the uniqueness of their contributions.

ABSTRACT

The present research project was initiated to explore and understand the experiences of teachers who participated in the residential, interdisciplinary learning communities of the Stokely Institutes for Liberal Arts Education. What began for many Stokely Fellows as an intimidating prospect became for some a transformative learning experience that brought participants closer to themselves and their own potential, to others in their diverse groups, and to the larger world. How those initial feelings of anxiety and intimidation were transformed into challenge, accomplishment, and confidence is the subject of this study.

Some who came to the Stokely Institute came with a sense of adventure; others came with a sense of uncertainty that often became one of intimidation. No one was unimpressed by the breadth of seminar topics or the volume of readings. Whatever the initial degree of uncertainty, that uncertainty was transformed to personal challenge and commitment through collegiality, collaborative interactions, and supportive conditions. Meeting the rigorous intellectual and emotional challenges required a commitment to a degree of open, collaborative exchange. Openness required a sense of well-being, minimal distractions, and the capacity to interact within an integrative framework. Those who experienced the transformation to openness attained levels of interactions necessary for further transitions to occur. What is clear, too, is that the degree of openness was related to the extent that participants viewed themselves as being treated as valued professionals within a safe,

diversion-free environment in which they were provided the latitude to explore personal meanings related to novel concepts and ideas.

The intensity of the workload sharpened the challenge and encouraged collaboration among participants. The resulting interactions formed the basis for the learning communities that emerged. The diverse perspectives that were voiced within this community of learners that included both participants and faculty provided potential sources for new insight, understanding, and meaning. To balance the rigorous demands of the readings, seminars often took exploratory turns in directions unforeseen, and loosely-specified response papers provided a path to reflection through which personal meaning coalesced. Confidence grew with acknowledged accomplishment that fed forward into renewed immersion within the collegial atmosphere of integrative diversity. The degree of empathy and love that defined group closeness was enhanced by continuing interactions that were both intellectual and social, thus encouraging more personal, shared reflection. For some, parting became difficult. Enlargement of self was attained through a previously-unrecognized connectedness with others within the world, and the meanings that emerged for participants were garnered by their own interpretative acts that elaborated the intention of being Stokely Fellows.

This dissertation, from its theoretical perspective to the development of its methodology, is grounded in constructivist thought that bridges numerous disciplines. It has its roots in the interdisciplinary human studies of Vico and extends to the natural philosophy that emerges from a study of the new sciences of complexity. Although these elements are separated by hundreds of years and thousands of discoveries and innovations, they are linked by a shared concern for understanding

the self-organized transformations of living beings in the process of bringing forth worlds. This study, then, does not deviate from that attempt, rather, it focuses those efforts upon the changes within members of a self-organizing community of learners known as the Stokely Institute.

TABLE OF CONTENTS

Chapter 1.....	1
Problem Statement	1
PURPOSE.....	3
PREVIOUS RESEARCH.....	3
SIGNIFICANCE	5
ASSUMPTIONS	6
METHODS AND PROCEDURES.....	6
Chapter 2.....	9
Theoretical Base and Review of Related Literature	9
INTRODUCTION.....	9
INTERDISCIPLINARITY	10
SELF-ORGANIZATION AND CHANGE	14
Complexity.....	14
In-formation	17
Learning	18
Autopoiesis.....	22
Interactive Learning at the "Edge of Chaos"	26
Insight as Catalyst for Self-Change	30
Manifestations of Exploratory Learning By Teachers	33
Chapter 3.....	37
Methods	37
INTRODUCTION.....	37
THEORETICAL BACKGROUND FOR RESEARCH PRACTICE	40
Constructing Interpretations	40
Science and Experience.....	41
Between the Poles There is Much Latitude	43
From Simplicity to Complexity.....	49
APPLICATION OF THEORY IN RESEARCH	53
Data Collection.....	53
Participants	55
Interview Contexts.....	55
Research Questions.....	56
Immersion.....	57
Insight.....	58
Coherent Patterns	61
Hyperqual	63
Interpretative Judgment.....	64
Ethical Interpretation.....	66
CONCLUSION.....	68

Chapter 4.....	71
The “Stokely Experience”	71
INTRODUCTION.....	71
SUPPORTING	75
The Program Component.....	76
Setting the Stage.....	76
Safety, Comfort, and Focus.....	78
The Faculty Component	80
The Participants Component.....	87
CHALLENGING	91
The Program Component.....	92
The Faculty Component	96
The Participant Component	98
OPENING.....	102
The Program Component.....	103
The Faculty Component	105
The Participants Component.....	107
INTEGRATING	111
The Program Component.....	112
The Faculty Component	115
The Participants Component.....	117
EMERGENT MEANINGS	122
Instrumental Meanings Related to Profession	123
Empathy.....	125
New Strategies	127
Synoptic Meanings Related to Personal Understanding.....	130
Learning	131
Broadened Perspectives	134
Renewal and “Growth for Old People”	136
Accomplishment and Confidence.....	141
CONCLUSION.....	144
Chapter 5.....	147
Discussion and Implications.....	147
INTRODUCTION.....	147
LEARNING REVISITED	148
BETWEEN THE POLES MUCH LATITUDE REMAINS	150
COMPLEXITY REVISITED.....	154
AUTOPOIESIS REVISITED.....	158
CONCLUDING.....	161
References.....	163
Vita.....	174

LIST OF TABLES

TABLE	PAGE
1. Scientific Orientations of Simplicity and Complexity.....	50

LIST OF FIGURES

FIGURE	PAGE
1. Schema for the self-organized interaction system of the Stokely Institute.....	74

Chapter 1

Problem Statement

INTRODUCTION

Change occurs in a self-structure when fluctuations of energy disrupt the existing psychological structure so that its elements contact each other in new ways and make new connections. Andrea Nelson

Growth, renewal, and change remain basic processes that often are neglected by professional development programs for teachers. In fact, developmental programs designed to enhance self-directed learning, renewal, and growth among experienced teachers are rare (Shea, 1992). Even more rare are investigations of these programs, a fact noted in the research-based literature on self-directed learning by adults (Taylor, 1986; Baskett & Hill, 1990).

While a shortage of renewal and growth opportunities for teachers persists, interest in adult learning and growth continues to increase. As Kolb (1984) has pointed out, this “drastic preoccupation” with adult development is most likely a natural outgrowth of an aging baby-boom generation. Whatever the impetus, the fact remains that the continuing developmental needs of teachers exceeds the limitations of professional development in-service programs aimed at reducing stress/burnout or increasing instructional skills. In fact, Maxine Green (1982) claims that the preoccupation with how-to psychology and the technologies of instruction has led teachers away from an on-going examination of their own values and philosophies and toward more precise application of technique.

Given the limited research opportunities to understand developmental learning among professional teachers, it is important to identify and investigate situations in which teachers, principals and academics have formed communities of learners from which to explore ideas and values in ways that reflect their own capacities for growth and change. One such opportunity was provided by the James R. Stokely Institute for Liberal Arts Education, a residential program available during the summer to experienced public school teachers and administrators of Tennessee. The Institute has provided educators a five-week interdisciplinary immersion into classical and modern arts, humanities and sciences. The Stokely Institute's demanding schedule of events is set within a collegial environment intended to bring about a close community of learners. This community involves itself in an examination of intellectual, ethical and professional assumptions that affect life and learning.

Begun in 1983 with funding from the Andrew Mellon Foundation, the first Stokely Institute offered twenty fellowships to secondary school teachers from the Appalachian Region. The original Stokely Program was intended to blend the liberal arts perspective with the distinctive features of the indigenous cultures of Appalachia. From its inception, the Institute offered an interdisciplinary curriculum that initially combined three courses of study: 1) Seminar in the Humanities and Social Sciences, 2) Seminar in the Natural Sciences, and 3) Teaching in Appalachia.

In 1986 the Institute came under the sponsorship of the Lyndhurst Foundation, a non-profit private agency whose interests include the support of innovative programs in teacher education. As a result, the

goals of the Institute became more focused on providing liberal arts enrichment to teachers and principals whose postsecondary preparations were primarily shaped by traditional training through teacher education curricula. The original interdisciplinary approach was preserved with the arts and sciences emphasis that began in 1986, with seminars in the humanities, the natural sciences, and the social sciences.

PURPOSE

The purpose of this research has been to ascertain how and what changes occurred in the professional and personal lives of Stokely Fellows. Specifically, the research proceeded from these essential questions: 1) what changes were derived by participants of the Stokely experience, 2) was there anything about the Stokely experience that facilitated the emergence of such change, and 3) what personal and professional effects did the Stokely experience have in the lives of the participants.

PREVIOUS RESEARCH

Much of the research in human development, whether cognitive (Piaget, 1952), psychosocial (Perry, 1970), or moral (Kohlberg, 1973) has focused on children, adolescents, or young adults. In turn, these studies have spawned an outpouring of investigations, both empirical and speculative, in many collateral areas. These studies often borrow, extend or modify one or more developmental stage theories to suit the purposes of the particular inquiry. While some of these studies have direct implications for adult learners and have been used to formulate adult

learning programs (Chickering, 1976; Widick, 1977; Kniefelkamp & Slepitz, 1978; Baseches, 1984), a growing number of research efforts have been aimed more directly at adult learners or learning in general. Most of the findings fall into one of three categories: 1) findings based primarily on case studies (Douglass & Moustakas, 1985; Taylor, 1986; Frick, 1990); 2) findings based on both experiential data and philosophical investigation (Gould, 1978; Kolb, 1984; Mezirow, 1991); 3) findings based on philosophical investigation and related scientific findings (Bateson, 1972, 1979; Maturana & Varela, 1987; Thelen, 1989; van Geert, 1993).

The initial literature review turned up only a handful of studies concerned with examining renewal, change, or self-directed learning among teachers. As Shea (1992) remarked, "one does not have to read many documents entitled 'Teacher Renewal' before concluding that these statements rarely offer much guidance Historical investigations into programs of teacher renewal, too, are either fragmentary or nonexistent" (p. 2). While this shortage of precedence may appear to hinder efforts to establish links to current practice and theory, a scarcity of similar studies may benefit the present investigation. As Glaser & Strauss (1967) indicate, qualitative studies are much less dependent upon a pre-selected body of literature than upon an openness to the participants that suggests direction for the research strategy.

A notable exception to the scarcity of teacher renewal programs operates under the name of the North Carolina Center for the Advancement of Teaching (NCCAT). NCCAT is located near Cullowhee, North Carolina on the campus of Western Carolina University. This program, which held its first residential seminars in

1985, was aimed at the “renewal, reward, and retention” (Rud, 1992, p. 34) of good teachers. NCCAT has been the subject of several essays and research articles (Rud, 1988; Shea & McPherson, 1990; Cooley & Bickel, 1992) that will be discussed in the next chapter.

SIGNIFICANCE

This study adds a new dimension of understanding to the literature concerned with the development and transformation of teachers as adult learners. It is based upon an understanding of self-transformation of individuals that occurs within interactive communities of inquiry. The capacity for teachers to transform themselves, to become enlarged by their own learning within an interactive community of learners, becomes a critical factor for understanding and validating the intellectual, social, and ethical development of their own students.

This study also hopes to further the investigation of any relationship of interdisciplinary, interactive learning environments to the professional and integrative development of teachers. Specifically, this research examines the relationship of interdisciplinary programs to the emergence of phase transitions (Taylor, 1986) that result from integrative insights and the discernment of the “the pattern that connects” (Bateson, 1979).

ASSUMPTIONS

The essential assumption underlying this study is that some participants of the Stokely Institute experienced varying degrees of transformations as a result of their experiences related to the Institute. These transitions may be short-lived or long term. They may be negative and/or positive in nature. The goal of this study has been to understand the degree, the quality and the persistence of such phase shifts as they are described by the research participants.

This study will be situated within the emerging sciences of complexity, which view social organizations and organic systems as adaptive, self-organizing (autopoietic) and dynamic (Maturana & Varela, 1987; Varela, Thompson, & Rosch, 1991; Kauffman, 1993). From the human development perspective, this approach is known as dynamic systems theory (Thelen, 1989; Smith & Thelen, 1993) or constructivist interactionism (Oyama, 1989). Cognitive science uses the terms emergence or enaction (Varela, 1991) to describe the constructive capacity of self-organizing systems.

METHODS AND PROCEDURES

Scientific research and philosophic analysis may be two different enterprises, yet in the best of all worlds the two will mutually inform each other, will converge in a single multidimensional view of the natural world, and may together provide a new set of metaphors with creative force. Gail Fleischaker

Personal documents can provide a glimpse into the development of an individual's constructed narrative. Prior to and during the Institute, several pieces of writing were requested from each participant. The first

was an essay that figured prominently in the application process. Essentially, applicants were asked to reflect, in a five-hundred word essay, on their reasons for applying to the Institute. These essays have been used in this research to establish background data and to understand presuppositions brought to the Institute by research participants. It should be noted that essays were used only on a voluntary basis, and all sections of personal documents used in the final study follow from the consent of the originator of the material.

A major component of the research has been in-depth interviews conducted with twenty former Fellows randomly selected from all those who volunteered to participate in the study. Participants in this study comprise a sample of twenty Fellows from 1986 through 1992, a time frame that includes those Institutes conducted under the same format. Most of the interviews were conducted in the participants' homes. The interviews were open-ended and did not follow a rigid format. All interviews were audiotaped and transcribed.

Data analysis was influenced by the constant comparative method first developed by Glaser & Strauss (1967), and later conceptualized (Lincoln & Guba, 1985) into a four-step process of unitizing, categorizing, filling in patterns, and member checks. Through the influence of modern hermeneutics (Lonergan, 1958; Gadamer, 1976) and complexity theory (Waldrop, 1992), the researcher has re-conceptualized the process of data analysis into these four steps: 1) immersion, 2) insight, 3) coherent patterns, 4) interpretive judgment. In addition to these four steps, peer debriefing was used as an ongoing tool to aid the analytical and interpretive process. Peer debriefing allowed for dialogue with the researcher's professional peers who were not directly involved in the

research process, but who could provide insights that may otherwise go unnoticed (Lincoln & Guba, 1985). This analytical tool is consistent with methodology developed by Victor Turner in anthropological studies of the ritual process (Turner, 1970).

In order that the data remain open to freely-generated insights, the analyses of transcriptions were not bound by any methodological prerequisites. The analysis has depended, rather, on a hybridization of analytical methods, all of which fall clearly within a qualitative paradigm. This approach is consistent with heuristic inquiry (Moustakas, 1990), a research approach that emphasizes the immersion of the researcher in the research process. Immersion is an attempt to understand and maintain the integrity of lived experiences by participants, and is an initial step leading to a rich interpretive description rather than to a capturing of phenomenological essences achieved through a bracketing of the researcher's insights.

Within the preceding paragraph are two implicit assumptions basic to qualitative research. The first is that the underlying force driving the research process is insight, a type of insight derived from an examination of experiential data—data of sense and data of consciousness (Lonergan, 1958, pp. 72-74). The second assumption is that, in an attempt to understand and interpret a participant's perspective on her experience, all interpretations are not equal; and in arriving at an understanding that can be understood and shared by others, a solid ground has been established from which interpretation may emerge.

Chapter 2

Theoretical Base and Review of Related Literature

INTRODUCTION

Every Stokely Fellow who participated in this study experienced some kind of change, i. e., all of them learned something. Now it is immediately discernible from looking at the data that these changes (henceforth learning) were both quantitatively and qualitatively different for each participant. We must conclude, then, that learning is a term that encompasses such quantitative and qualitative differences.

As Bateson (1972) has pointed out, learning involves change of some kind; yet "to say *what kind* of change is a delicate matter" (p. 283). That it has been and continues to be a delicate matter is attributable in part to a habit of ascribing to learning a single set of features that fails to capture the multiplicity of changes deriving from various learning contexts and intentions. Thus we enjoy a history of pitched battles between competing academic camps for what truly constitutes a phenomenon that is singular only in the sense that we use a single word to point toward it—learning. While these kinds of debates help to polish and thus clarify individual facets, the gem is rarely exhibited in its multifaceted elegance.

The learning that the Stokely participants most often talked about was an interactive self-directed exploration from within an interdisciplinary, collegial community. This type of exploratory learning

eventually helped to generate both personal and intellectual insights that became a primary focus of the descriptions and interpretations of their experiences at the Institute.

With these considerations in mind, the following discussion will interweave the figural aspects that constitute the theoretical perspective derived to elucidate the descriptions provided by the research participants. These aspects are: 1) philosophic and scientific findings related to the significant factors of interdisciplinarity, learning, interactions, and insight; 2) closely-related research that bears directly on the present study.

INTERDISCIPLINARITY

Education as an area of study is ultimately concerned with learning at various levels. Despite this, the determination of what constitutes learning and how learning occurs are most often relegated to those less often associated with the teaching of learners. This task has been taken up to a great degree by cognitive science, which provides a large umbrella for various disciplines and sub-disciplines. Thereby separated from the scientific principles and theoretical considerations that constitute its foundations, education most often focuses its energies upon the organization and content of learning (curriculum) and the technology associated with delivering that content (instruction). Thus, we have on the one hand a practice whose goal (learning) is less understood than the process of reaching it, and, on the other, a science that is detached from the primary testing grounds for its theories regarding learning.

Neither the cognitive scientist nor the educational scholar/practitioner is entirely responsible for the breach between theory

and practice. This is a complex issue that involves many interrelated factors, not least of which is the traditional role of public schooling. This demarcation, however, has been exacerbated by the fragmentation of the information pool (Laszlo, 1987) into specialties and sub-specialties that are divided further into the instrumental concerns of the practitioner and the synoptic concerns of the theoretician. While this proliferation of disciplinary categories has yielded extraordinary benefits through research applications, there has yet to emerge a proportionate wisdom that would somehow provide an integrative approach to solving the problems that are the by-products of many of these applications. These problems, both ecological and ontological in nature, can be seen as predictable consequences to an analytic reductionism that views the human enterprise of science, whether physical, organismic, or social, as an elaborated atomism whose own criteria for objectivity puts the scientist in a position of proclaiming for himself a view from nowhere. As Varela (1991) has remarked, "the Cartesian commitment to reduction that was meant to justify the replacement of the collective by the individual as the locus of actions annihilates the individual on its march toward the quark" (p. xvi).

If the twentieth century can be characterized as bringing to fruition the analytic programme of science, there is evidence that the next century may launch a complementary programme aimed toward synthesis (Laszlo, 1987; Redner, 1994), or what Goodwin (1994) describes as a "science of qualities." This emerging integrative worldview does not indicate the end of disciplinary distinctions. To suggest as much would be to be to risk another form of reductionism based upon the imposition of a single interpretive framework, a situation that interdisciplinarity strives

to redress. It is essential that we remain mindful that each level of analysis maintains its own logics based upon its own concerns and choice of symbolic representations. Thus far, we have not developed an interdisciplinary language that provides full access across disciplinary boundaries. This apparent language barrier may be less a problem than an opportunity for communication and new information to evolve (DePryck, 1993) so that the hurdle that seems insurmountable becomes traversed through conceptual and perceptual processes that continue to transform our levels of understanding.

An emphasis on interdisciplinary learning is common to contemporary educational thinking and to many school reform efforts (Darling-Hammond, 1993). There is a common-sense understanding that interdisciplinarity may lead to richer and more rewarding learning experiences. Despite this widespread view, much of the literature calling for interdisciplinary or multi-disciplinary learning often neglects to tell us what it is about interdisciplinary strategies that make them worthwhile. A research-based theoretical underpinning is missing in most of these discussions.

Klein (1991) points out that the impetus toward interdisciplinarity has come from two directions, one arising from pragmatic or instrumental concerns and the other developing from a synoptic rationale that has understanding rather than application as its primary goal. The separation of these two approaches, which seems ironical when considering the imbricated nature of interdisciplinarity, is usually maintained by those who dismiss the theoretical by concentrating on engaging the task at hand, as well as by their counterparts who focus on the theoretical, thereby avoiding the messiness involved in substantiating

their theories.¹ Both instrumental and synoptic concerns are at least implicit in the elaboration of interdisciplinary educational goals that may be summarized as follows: 1) an ability to identify problems within varying contexts, 2) an ability to address the problem both creatively and rigorously, and 3) a commitment to collaborative resolutions that emerge from a multiplicity of perspectives engaged in continuing dialogue. These are all worthwhile goals that, if taken seriously, could contribute significantly to the data-centered designs to which most schools subscribe. Yet we are left with the question: what is it about interdisciplinarity that leads large numbers of professionals to assume that an integrated, interactive school program might lead students to such learning outcomes. This, in turn, suggests a larger question: if interdisciplinarity does generate learning patterns and connections that leads to new understandings and solutions to practical problems, what is it about the organizational underpinnings of schools that maintain them in regimes that are so resistant to change. A full accounting for these questions is beyond the purview of this study, but it is hoped that a response can be formulated to suggest some possibilities that may be pursued more fully in further studies. In coming to understand the potential role of interdisciplinarity in learning and the scarcity of its application, let us turn first to our own discipline of education.

¹ In colleges of education, this distinction is maintained by awarding terminal degrees that are aimed at either practitioners or theoreticians.

SELF-ORGANIZATION AND CHANGE

Invariance that characterizes a system can only be studied under perturbations that reveal it, and thus against a background of change. Conversely, change in a system is only in reference to that in it which stays unchanged: its identity as a system. Francisco Varela

Complexity

Understanding what constitutes learning and how learning occurs presents particular challenges to social scientists and educators who recognize the need to develop methodologies more attuned to human experience than those based on assumptions borrowed from the physical sciences. Yet our own discipline of education continues to apply physical laws such as the second law of thermodynamics² and other aspects of classical mechanics into the study of how learning ecologies operate and are maintained. The assumption that is derived from such applications is that, without external controls, social systems (schools) and the components of those systems (teachers and students) will naturally tend toward a breakdown in order and learning. The organization of schools reflects this historical assumption in the continued implementation of programs and accountability plans that attempt to maximize order, restrain disorder, predict outcomes, and compel motivation. These efforts ignore or reject the possibility that, given the proper parameters for self-sustaining growth, biological and social systems exhibit the inherent capacity to self-organize, adapt, and undergo transitions that lead to

² Murray Gell-Mann (*The Quark and the Jaguar*, W. H. Freeman, 1994) recalls the old physics joke that says the first law of thermodynamics tells us that we can't win and that the second law insists that we cannot even break even. While the inevitability of entropic gains over time will not be argued here, we wish to acknowledge the negentropic boost derived while living systems engage in the activities that characterize the status of the living—energy exchanges through interactions that lead to new information production.

higher levels of complexity indicative of new levels of learning (von Foerster, 1984; Luhmann, 1990; Goodwin, 1994).

Thus, we are the inheritors of a system of schooling that seeks legitimacy through the application of principles that are more applicable to closed physical systems than to biological and social systems—or open systems. Even though “assuming a closed system allows one to determine an equilibrium point and predict probable macroscopic behavior with a great deal of precision and accuracy” (Brooks & Wiley, 1988, p. 55), such an assumption leads to learning parameters that constrain the openness and interactivity that are essential for transformative learning to occur. Self-organizing and adaptive systems, whether biological or social, depend upon continuing interactions for the exchanges of energy and information required for maintenance and transformation.

While social theorists, researchers, educationists, and philosophers have failed to move our ontological assumptions beyond those based on Newtonian science, it is now the questions and findings of science itself that may change the way we view the constitution of reality and, therefore, knowledge. These are the possibilities explored by a recent branching of a cross-disciplinary scientific inquiry known as complexity theory. Since the search for principles underlying pattern formation may be appropriate for disciplines ranging from chemistry to immunology to economics, complexity theory may appear variously labeled. Complexity theory sustains an interdisciplinary effort that links the mathematical and physical elements of chaos theory (Prigogine & Stengers, 1984; Gleick, 1987) with the biological, social, and epistemological elements of studies concerning origins (Koppers, 1990; Varela & Dupuy, 1992), self-organization (autopoiesis) (Maturana & Varela, 1980, 1987; Jantsch,

1980), and evolutionary theory (Kauffman, 1993; Goodwin, 1994). The goal of these new sciences is to comprehend and explain general laws of pattern formation (Waldrop, 1992) within open systems that result in changes indicating higher levels of complexity. Open systems exhibit self-organized, adaptive behavior and maintain exchanges of matter and/or energy with the surrounding environment. The study of complexity focuses on emergent behaviors that result from interactions within and among self-organizing and adaptive systems (Kaufmann, 1993). Complexity acknowledges that evolution and learning are processual and contingent upon the number and variability of interactions between organisms-in-environments, thus recognizing the evolutionary nature of learning and the learned nature of evolution.

Because complexity is concerned with pattern *formation*, the focus is on the transformations or phase transitions that provide the markers for growth, change, or learning. As scientists or educators, the study of learning communities as self-organizing systems offers an opportunity to study the conditions that are in place when phase transitions occur. This, of course, does not allow us to predict the exact timing or the consequences of particular transformations, but it does give us good clues about the appropriate parameters for the likelihood for subsequent phase transitions. Kelso (1990) points out that “the reason why phase transitions are crucial is because qualitative change allows a clear distinction of one behavioral pattern from another, thereby enabling one to identify the order parameters or collective variables for different patterns” (p. 249).

In-formation

If we accept the notion that energy exchanges are necessary for the continued survival and growth of self-organizing, open systems, and if we understand that in-formation is the form in which energy is manifested in systems that are comprised of self-organizing and adaptive learners, we move closer to an understanding of the link between the study of complexity and that of learning . In the case of learning, in-formation is designated as the measure of interactions among learners with the data available to them. So that we do not confuse data with in-formation, let us make clear that data are the basic units upon which the process of in-formation depends. Minimally, these basic units must constitute a difference (Bateson, 1972). We can understand, then, the basic in-formational act as the discernment of differences—and the basic cognitive act the creation of distinctions (Maturana & Varela, 1980) by the learner.

In-formation is defined here in the “original etymological sense of *in-formare* , to form within” (Varela, 1979, p.266). It is an active process that is enabled by the learners' interactions with the data that encode potential differences to be derived by each learner's own in-formational acts. As Maturana and Varela (1987) point out, in-formation is not derived by a passive reception of inputs from the environment:

. . . . the nervous system does not ‘pick up information’ from the environment, as we often hear. On the contrary it brings forth a world by specifying what patterns of the environment are perturbations and what changes trigger them in the organism. The popular metaphor of calling the

brain an 'information processing device' is not only ambiguous but patently wrong (p. 169).

In-formation derives from the choice and configuration of data by learners. Data remains only potential in-formation until it is taken up within the context of the learner that gives it meaning; and meaning only accrues from the value that learners attribute to facts and other data. We may even say that one person's in-formation is another person's data, or vice versa. For the most intriguing insights recorded in the most elegant phrasing remain in-formational to the originator alone until they attain the shared medium that provides the opportunity for in-formational coupling with another learner. The extent to which data becomes in-formation is a measure of the level of learning, and thus a measure of the interaction level attained between the learner and others or between the learner and self. Gregory Bateson (1972) described these levels in detail, and Morris Berman (1981) later used them to focus upon the levels of learning that lead to transformational change within learners' world views.

Learning

Bateson (1972) acknowledged five levels of learning. The first level Bateson called "zero learning," which is characterized "by specificity of response, which—right or wrong—is not subject to correction" (p. 293). An example of zero learning would be the passive receiving of data from an external source. At the other end of the learning spectrum, we have Learning IV, which Bateson describes as learning at the ontogenetic, as well as at the phylogenetic level.

Learning I provides a single set of alternative reactions to the learner. Over time, however, Learning I allows for "correction of error of choice within a set of alternatives" (p. 293). This type of learning involves stimulus, response, and reinforcement. Learning I "contains those items which are most commonly called 'learning' in the psychological laboratory" (p. 288).

Learning II is essentially learning about Learning I in that the learner may make changes in the sets of alternatives for the solution to a problem. Learning II requires a degree of pattern recognition within data sets that is derived from a correct anticipation or recognition of problem solutions developed from a previous context. Data sets and informational parameters are largely pre-determined, but informational interactions and individual strategies are controlled by the learner. The learner selects from a repertoire of problem-solving strategies by recognizing patterns within the data that match pre-defined problems. Contexts for Learning II may range from literary analyses to laboratory experiments. This type of learning intentionally leads to an understanding and linking of concepts from within a pre-established framework for doing so.

Learning III begins when learners explore the questions and anomalies that become focal through the interactions of their own experiential patterns with the repertoire provided by Learning II. This occurs as life experiences and the meanings of those experiences that accrue from our interpretations of them come into conflict with one or more of the templates supplied by Learning II so that new exploration triggers insights that, in turn, lead to new coherent patterns. Thus, Learning III is learning about Learning II in that the interactions that

accrue among various perspectives form a complex web that engenders the emergence of new meanings and resolute strategies that go beyond the paradigmatic constraints acquired within Learning II. These interactions, in fact, shape the learner while shaping those who share the learning community within which the learner is engaged.

Similar distinctions of learning levels have been made by Säljö (1979), whose research into student perspectives on learning uncovered five distinct categories that extend from the surface approach (Categories 1-3) to the deep approach (Categories 4 and 5). Levels 1-3 range from the accretion of data to memorizing to acquiring skills and formulae. These categories are consistent with Bateson's Zero Learning- Learning II. Säljö's Levels 4 and 5 indicate a deep approach to learning in that these levels include the creation of meaning and the transformation of realities so that the world is seen differently (Bateson's Learning III).

The mutual shaping of perspectives within communities of self-directed learners is among the findings of Taylor (1986), who examined self-directed learning from the perspectives of graduate students enrolled in a course designed to promote the facilitation of self-directed learning among adults. Taylor focused upon those phase transitions that occur as students move from learning that is directed by others to learning that is self-directed. She identified four phases and four phase transition points that characterize this movement: 1) disconfirmation (phase transition), 2) disorientation, 3) naming the problem (phase transition), 4) exploration, 5) reflection (phase transition), 6) reorientation, 7) sharing the discovery (phase transition), 8) equilibrium. This helical cycle, which resembles the hermeneutic process, is initiated by a "collapse of the learner's frame of reference" (p. 59). Such a discrepancy between

expectations or past experience and the present reality is, indeed, the beginning of Bateson's Learning III, which becomes fully engaged in exploration, reflection, and reorientation. These points indicate the presence of transformative insights and the emergence of new meanings that re-interpret "the intention of being" (Lonergan, 1958, p. 358). It is at this juncture that learning moves from discovery to enaction, i. e., learning is no longer choosing between alternatives or sets of alternatives but, rather, in generating sets of alternatives that did not exist before.

As Bateson suggests, such transformational learning may challenge the established concept of self whose security is often maintained through habit, or what Lonergan (1958) identifies as "common-sense eclecticism." Having experienced in-formational stirrings that do not match any previously-acquired template for understanding, the learner may experience a transformation of world views that could include a transformation in how the learner views his own learning. As Perry's (1970, 1981) research showed, this kind of deep learning may indicate a move from a naive and passive epistemological position to a broader commitment to an active learning process open to further transformation.

The attainment of Learning III is not a simple matter. Among the changes that Bateson (1972) identifies as providing evidence for Learning III, he indicates that the learner may, in fact, "learn to close for himself the 'loopholes' which would allow him to avoid Learning III" (p.303). In such a case, we may expect the learner to construct defensive strategies against any further disorientation or confusion associated with the possibility for subsequent transformations. One may even ask why we should continue to engage the emergence of new meanings if the

transitional experiences are consistently fraught with emotional upheavals.

In Frick's (1983, 1987, 1990) phenomenological studies in which he examines life-changing transition points, he concludes that "symbolic growth experiences" involve the "conscious perception of the symbolic-metaphorical dimension of immediate experience leading to heightened awareness, the creation of meaning, and personal growth" (1987, p. 407). Frick's work focuses on the development of personality, but he identifies two dynamics that are at work in transformational learning. One involves the maintenance of "integration, order and stability" that is brought about by "self-consistent organization" (1990, p.71). The other dynamic involves "differentiation, change and growth" that characterize the structure of humans seeking "to discover and actualize new facets of being" (p. 71). Frick argues that it is the symbolic growth experience that bridges these seemingly-conflicting dynamics by assuming a function that may be self-correcting or self-enhancing (pp. 72-76).

Autopoiesis

Self-maintenance and self-generation constitute the underlying principle developed by Maturana & Varela (1980, 1987) known as *autopoiesis*. Their investigations of the neurophysiology of amphibians initiated an understanding of cognition based upon the active construction of in-formation by self-organizing and adaptive organisms. Maturana's research indicated that, in the perceptual process, the visual field is configured as a result of a two-way flow of data to and from the brain. This concept of a two-way transmission that leads to the brain's construction of in-formation regarding the outside world has resulted in

reconsideration of correspondence theories to account for what frogs, as well as humans, see.

Autopoiesis means "self-produced," and, as indicated in the previous discussion regarding in-formation, the process is often referred to as "bringing forth a world" (Maturana & Varela, 1987). We may contrast this notion of self-organization to assumptions underlying behavioral input-output models still used extensively in educational research that focus upon reaction by organisms to environmental stimuli.

Autopoiesis

. . . capitalizes on the idea of homeostasis, and extends it in two significant directions: first, by making every reference for homeostasis internal to the system itself through mutual interconnection of processes; and secondly, by positing this interdependence as the very source of the system's identity as a concrete unity which we can distinguish. These are systems that, in a loose sense, produce their own identity; they distinguish themselves from their background (Varela, pp. 12-13).

This line of thinking, which extends beyond biology (Kaufmann, 1993) to developmental psychology (van Geert, 1993) and to interaction systems of communication (Luhmann, 1990; Krippendorf, 1994), does not deny the importance of the immediate environment: the autonomous system must still operate within the parameters of the environment within which it participates. But as Goodwin (1994) points out, "the capacity of these processes for self-completion, and their

specificity, come from within the organism itself. The causal powers acting within the organism have a property of closure that defines a specific entity, a dynamic form with identity and agency that can be expressed within a range of environments” (p. 176).

The closure to which Goodwin refers is the critical element in coming to understand autopoiesis. At first it sounds paradoxical to talk of open systems such as organisms, societies, and interaction systems as being characterized by operational closure. After all, these systems depend upon exchanges of matter, energy, and communicative data for their continued survival. Operational closure refers to the interlocked features of any self-referential unity, whether biological or social, whose organization and structural components engage in a process that produces itself. Organization may be understood as “those relations that must exist among the components of a system for it to be a member of a specific class” (Maturana & Varela, 1987, p. 47). Organization may be thought of as boundary conditions within which the unity operates. The other co-originating feature of an autopoietic unity is its structure, which “denotes the components and relations that actually constitute a particular unity and make its organization real” (p. 47). Structure would include the members of a particular unity and the dynamics involved among those members that constitute the network of interactions involved in continued *autopoiesis*. Organization and structure, then, constitute a “unitary phenomenon” that occur simultaneously as an “autopoietic system pulls itself by its own bootstraps and becomes distinct from its environment through its own dynamics” (p. 47).

Within a metabolizing cell, it is easy enough to think of the membrane as the organizational boundary and the cell metabolism as its

structure. The cell's continued organization is maintained through the dynamics of the chemical transformations of its metabolism, and the dynamics of its metabolism are enabled by the cell's continued organization. Organizational maintenance and structural interactions are the reciprocating aspects of the single phenomenon that are co-originating. If maintenance were overemphasized, then the necessary generative interactions of the structural components would be restrained. On the other hand, if the structural interactions do not sustain the boundaries that distinguish it from its background, then the identity as a unity comes into question.

The co-origination of organization and structure is operative, too, in interaction systems such as autonomous learning communities that depend upon communication. If we think of languaged communication as the organizational aspect of the interaction system, and the emergent meanings of its members as providing the structural aspect of the system, then it is possible to appreciate the interlocked phenomenon of self-maintenance and self-generation that characterizes autopoietic systems. As Luhmann (1990) concludes:

The autopoiesis of communication by communication requires *closure*. Meaning, on the other hand, is a completely open structure, excluding nothing, not even the negation of meaning. As systems of meaning-based communication[,] societies are closed and open systems. They gain their openness by closure (p. 147).

The picture that begins to emerge is one of a learning ecology that is shaped by individual in-formational acts that are, themselves, shaped by the organizational relations that provide the boundary conditions for that learning ecology. To understand that the maintenance of organization and the growth of structure are shaped while they are actively shaping is to recognize the essential interconnectedness that characterizes the transformative learning that occurs when self-organizing learning communities coalesce. This ecological orientation on the macro scale is summarized by Livesey (1972) quoting Dobzansky: “. . . by changing what he knows about the world man changes the world he knows; and by changing the world in which he lives, man changes himself (p. 151).”

Interactive Learning at the “Edge of Chaos”

Studies of self-organizing systems have shown that levels of interactions among components of the system are crucial for the movement of the system toward increased complexity or new learning. Chris Langton, a researcher at the Santa Fe Institute, experimented with initial conditions for local interactions of components within self-organizing systems of the simulated life forms of cellular automata. He discovered what he later called the “lambda parameter.” He found the lambda parameter to be a level of interaction just beyond the mid-point between no interactions and numerous interactions. When interactions were absent, the cellular automata exhibited zero growth. When interactions were sparse, some self-organization was apparent, but soon the dots on the computer grid coalesced into static blobs at fixed points. When the interactions between components were extremely numerous,

the computer grid became chaotic, with cycles of accelerated growth followed by mass extinctions. When the parameter for interactions was established just past the mid-point, however, the automata exhibited “coherent structures that propagated, grew, split apart, and recombined in wonderfully complex ways” (Waldrop, 1992, p. 226). This was the lambda parameter, the rule for interaction levels that produced continued growth, transformation and, in computer science terms, maximum computation. What became most interesting to Langton was the repeated tendency for these systems to experience growth, transformations or phase transitions, followed by reorganization at the point where small changes or perturbations could trigger large-scale changes throughout the artificial ecology. Langton calls this point “the edge of chaos” (Waldrop, 1992).

As Goodwin (1994) discusses these findings, he points out that Langton’s cellular automata do not move to the edge of chaos spontaneously. Goodwin suggests that the organizational relations must be established for a “maximum dynamic interaction” (p. 184) in order for individual transitions to cascade back and forth through the system, thus producing community as well as individual effects. By doing so, the individual partakes of a community continually enriched by her own individual interactive capacities.

The significance of these and other findings (Holland, 1975; Wolfram, 1986; Langton, 1994) becomes evident if we consider schools as autopoietic organizations—and learning as an enactive property that is self-generated rather than rule governed. To recognize this, we do not have to abandon all thoughts of rule-governed learning. There are, and will continue to be, collections of cultural data manifested in traditions

that we pass on to successive generations. The tendency for the educational process to reify predetermined learning outcomes (Learning I and II), however, leads to the inculcation of data without the commensurate opportunity to engage the in-formational acts that accrue from interactive, self-generated thought and reflection (Learning III). For instance, geography students may specify locales on a map or a globe while remaining clueless about defining their own connections with the world represented by that map or globe. Similarly, a science teacher who is a Stokely Fellow could, indeed, commit to memory Descartes's Meditations without any requisite understanding as to how her own teaching of science is informed by these ideas.

We also know that the variability of perspectives that comprise the in-formational character of each component is of further importance in determining the potential for the system to evolve or transform. Just as heredity and genetics are "enriched by effects that combine the structural alternatives of a group of living beings" (Maturana & Varela, 1987, p. 82) at the phylogenetic level, the variability of multiple disciplinary perspectives provides increased in-formational alternatives at the ontogenetic level—the level from which learning among social organisms occurs. When the increased variability of disciplinary perspectives is added to learning environments, the potential for new information and meaning increases. Koppers (1990) notes that "the optimum of production of information may be presumed to lie at the point where there is as much novelty as possible and no more confirmation than is necessary" (p. 56).

Now if this process of self-generated meanings that form "patterns through time" (Bateson, 1972) constitutes transformative learning, we

begin to see the potential for learning associated with the dynamics of interactive disciplinary perspectives. Interdisciplinarity brings with it simultaneous interactions of multiple perspectives. Given any phenomenon that is the focus for understanding, we may see the probability for transformative insights increasing as multiple disciplinary perspectives converge upon the phenomenon under study. If, indeed, transformations or phase transitions occur when the number and variability of interactions among components of a system are “sufficiently rich” (Depryck, 1993, p. 100), it is clearer how interactive learning environments may provide the transformational boost that occurs when contexts overlap as information is reconfigured, thus “producing a multiplicity of meaning around any given phenomenon” (Bloom, 1992, p. 182).

The learning dialogue that takes place within interdisciplinary and interactive learning environments is shaped by the continuing emergence of new meanings by those who constitute the dialogue—the learners who bring to the discussion their own histories of transformations (ontogenies) that provide the distinctions underlying each set of experiences. It is the on-going interaction of these ideas and values that “leads to the gradual erosion of boundaries” (Pilet quoted in Klein, 1990, p. 43) or to the enlargement of personal boundaries that may include elements of various disciplinary perspectives. It is through this rich, complex intermingling of ideas and values that new questions, insights, and meanings find expression that are both pragmatic and conceptual in nature. Thus, the instrumental and synoptic interests are both given priority in the realization that doing and knowing are not separate

operations but, rather, two complementary components that recursively define each other in the evolution of in-formation and meaning.

Insight as Catalyst for Self-Change

The moment of passage from disturbance into harmony is that of intensest life. John Dewey

The desire to understand what Lonergan (1958) terms the “known unknown” is deliberate. As Gadamer (1976) has said, “we cannot understand without wanting to understand, without wanting to let something to be said” (p. 101). Thus, the desire to overcome the initial disconfirmation and disorientation that signals the onset of Learning III may lead to naming the problem and subsequent or concomitant exploration. In the study on self-directed learning mentioned earlier, Taylor (1986) identified five characteristics of the exploratory phase:

- (1) an intuitively-guided exploration;
- (2) a predominantly present-oriented time sense;
- (3) collaborative relationships with others;
- (4) a series of ‘insight episodes;’
- (5) a gathering of confidence and satisfaction (p. 62).

We will now turn to a discussion of “insight episodes” as primary punctuation markers of the exploratory phase of learning.

Languaged data speaks or becomes in-formation through insight, and as Gadamer (1976) suggests, insight is derived from an act that begins with a conscious grasping that forgets itself in the conversation with others, and that concludes as “linguistic circles come into contact with

each other, merging more and more" (p. 17). This merging within what is sometimes referred to as the "consensual domain" (Maturana, 1978) occurs within time frames, as in face-to-face conversations, and between time frames, as in the case of the researcher immersed in transcribed interview data. Insight, for Gadamer, is that point within an event in which co-determinative horizons are fused "within the inner infinity of the dialogue" (Gadamer, 1976, p. 17), whether between past and present or between the co-presences of social beings.

Gadamer's gradualist view of insight reasserts tradition as the historically-contingent, yet inexhaustible, source of being from which understanding is derived through the imaginative questioning of the subject matter that is the focus of inquiry (Gadamer, 1976, p. xxii). Tradition in this sense contains not only our history of transformations but also the ongoing emergence of new understanding in the successive formation through experience of "new preunderstandings" (p. 38). Gadamer further argues that overcoming "misunderstanding and strangeness" do not provide the initial conditions from which hermeneutic inquiry originates; rather, it is from the foundation of preunderstanding that inquiry proceeds: "Only the support of familiar and common understanding makes possible the venture into the alien, the lifting up of something out of the alien, and thus the broadening and enrichment of our own experience of the world" (p. 15).

Given the importance that Gadamer attaches to imaginative questioning, one may ask how such questioning could originate from an equilibrated state characterized by a preponderance of preunderstandings. The answer lies in the interactions that occur, for it is within those interactions that preunderstandings rise above their concealment in

language by blocking the emergence of understanding: "One of the fundamental structures of all speaking is that we are guided by preconceptions and anticipations in our talking in such a way that these continually remain hidden and that it takes a disruption in oneself of the intended meaning of what one is saying to become conscious of these prejudices as such" (Gadamer, 1976, p. 92). Thus, hermeneutic inquiry differs from normal science in that the researcher is at once examining data as well as the actions that provide data its informational content or its meaning. It is by engaging this reflexive capacity that we may avoid the methodological constraints imposed by a scientism that would provide artificial boundaries for insights that would otherwise enable and encourage the exploration of a broader terrain.

The Gadamerian programme, then, elicits understanding through the gradual accumulation of insights that are themselves attained gradually through a recognition of either the merging or the standing apart of hermeneutic circles. This appropriation of insight stands in stark contrast to the characterization provided by Heidegger, who saw insight as a quasi-mystical visitation that appeared with the force and rapidity of a flash of lightning (Dostal, 1994, pp. 55-57) and which functions not to advance us into the "known unknown" (Lonergan, 1958) but as the relief from an anxiety associated with alienation from being or understanding. Moreover, flashes of insight do not necessarily proceed from an immersion into the subject of inquiry that signals the engagement of understanding; but, rather, insights are veridical in the sense that their transformative powers are unquestioned. Now if Heidegger sometimes appears to be hurling himself beyond a language that he seemingly was hoping to encounter along the way to it, it may be attributable to

Heidegger's double frustration that came as a result of his attempt to grasp, or be grasped by, that (Being) which eludes the logic of the dialectic at the same time that it (Being) cannot be communicated to others simply through intuition. Dostal (pp. 66-67) argues that Gadamer recognized Heidegger's predicament and its implications for the restructuring of a hermeneutic science that would deny neither the spontaneity of intuition nor the deliberation of logical reasoning. In doing so, Gadamer came to develop an interpretive vehicle that moved back and forth between imagination and rigor, between the novel that is constituted in emergent behaviors and meaning arising from interactions, and the confirmatory that is maintained by organizational closure that embodies our histories of transformations. We can assuredly see that Gadamer did locate a grounding for Heidegger's abstruseness that is characterized by human facticity within an historical dimension. The historical dimension provides an evolving "background of action" (Varela, Thompson, & Rosch, 1991, p. 145) whose changes are proportionate to the continued occurrences of human insights that emerge from within boundaries that our interactions sustain.

Manifestations of Exploratory Learning By Teachers

My self-esteem as a teacher was boosted tremendously. I had begun to have doubts as to how much difference I can make. My seminar made me feel professional and inspired me. What I do is certainly important to the future of the world. Teacher and former NCAAT participant

Whether we describe the phenomena of personal change as insight episodes, symbolic growth experiences, phase shifts, or phase transitions, we are describing learning events that take on special significance for persons who experience them. In short, we are talking about an

emergence of meaning that occurs through a "peak learning experience" (Bloom, 1981). Documentation is rare for these insight-based experiences "that can affect the course of one's life and education" (Rud, 1988, p.6). A notable exception comes from a collection of essays and research articles (Rud & Oldendorf, 1992) that examines the rationale, the operations, and the effects of the North Carolina Center for the Advancement of Teaching (NCAAT).

In some ways NCAAT resembles an abbreviated Stokely Institute. Instead of a five-week residential program, most seminars are for one week. NCAAT is inquiry-based in the liberal arts, and it attempts to maintain a collegial, supportive community of twenty teachers and varying numbers of university faculty members. NCAAT held its first residential seminars in 1985. The goal of the teachers that participate is renewal and exploration through an examination of chosen topics; the goal of the organizers is to have teachers once more become "learners and inquirers" through "cognitive and artistic adventures" (Rud, 1992, p.45).

NCAAT was conceived as a response to a challenge presented by Jean Powell, a North Carolina English teacher who spoke of a desire by teachers to "study the real stuff":

What about going to a summer school for 1 or 2 weeks, or even 4 to 6 weeks, to study some of the great books: Plato, Homer, Virgil, Shakespeare, and others? Include an opportunity to visit an art gallery, see live performances of Shakespeare's plays along with videotapes and films, with outside reading and even writing critical commentaries. If that kind of learning experience doesn't turn on teachers of

the humanities, I don't know what will. That excitement will be communicated to students. Furthermore, being a student will give a teacher a renewed perspective of the student's role (Rud, 1992, quoting from Powell, p. 29).

The effects of NCAAT on its participants has been reported by Cooley & Bickel, 1992), whose evaluation study for NCAAT examined how the experience generally affected teachers' lives. In a survey of the 740 teachers who attended the seminars between the summer of 1985 and December 1987, the researchers were able to construct a "composite portrait" (p. 123) from which participants cited "rejuvenation and intellectual stimulation" (p. 123) as the primary reason for attending. The composite reveals that "the most rewarding aspect was that the Center staff made [the participants] feel really appreciated" (p. 123). The evaluators report that "the teachers felt that they were treated as intelligent, deserving, highly-valued citizens, and teachers are not used to that type of treatment" (p. 124). Other benefits that the participants cited were "the opportunity to form close ties with other teachers from North Carolina; and the fact that the Center renewed their love of learning" (p. 124).

The NCAAT experience foreshadows a significant section of the findings of the present research regarding effects of the Stokely Institutes. However, just as NCAAT was an abbreviated version of Stokely, the intensity of the participant experiences of Stokely provide an amplification of the NCAAT accounts. The expanded opportunity for transformative learning experiences that characterized the Stokely Institutes will be taken up in Chapter 4, which proceeds from the

following discussion of a methodology designed to study emergent meanings within a self-organized learning community.

Chapter 3

Methods

Our theories are not descriptions of reality as it is but, rather, ever-changing forms of insight, which can point to or indicate a reality that is implicit and not describable in its totality. David Bohm

The real, in the only sense in which it can be used with theoretical precision, is what we can know by critical reflection and judgment when the fulfilling conditions include experiential data--data of sense and data of consciousness. Bernard Lonergan

INTRODUCTION

It may be said that understanding is the minimal goal of a social research that is engaged in exploring the various meanings of human experiences. Yet what does it mean to understand? Understanding is the continually-emerging cognitive act that provides a link between discovery and invention, between the world of other and the world of self. In this sense, understanding does not mirror the meaning of others, for the perspectival and linguistic limitations imposed by the status of the researcher delimit hopes for exact representation if the researcher is to contribute anything more than a verbatim account of what is said by her participants. Thus the goal of the social researcher is distinct from that of reporter, who is charged with presenting data unencumbered by an attempt to understand or explicate them. The reporting of data does not fulfill the demands of a social science that has as its goal the "higher truth" involved in the translation of linguistically-mediated social phenomena (Gadamer, 1976). And even if the reporting is not verbatim,

but what is judged to be significant, this is still not enough for the social researcher, “for significance is not in the data but accrues to them from the occurrence of insight.” (Lonergan, 1958, p. 415) Thus, the data are not the end of social research but the beginning, from which the researcher engages “by explicating it within one’s own horizons with one’s own concepts and thus giving it new validity” (Gadamer, 1976, p. 94). In so doing, data are transformed to in-formation “in the etymological sense of *in-formare*, to form within” so that “in-formation is always interpretation” (Varela, 1979, p. 266).

Yet the researcher cannot presume to neglect what is told him by his research participants, since it is the meanings that participants attribute to their experiences that he set out to understand in the first place. Thus, we reach the crux of the hermeneutic problem as it relates to social research: how does the interpretive researcher faithfully report the experiential renditions of others while fully engaging his own capacity to understand and to communicate that understanding?

In answering this question, we must recognize three types of understanding involved in social research: 1) the understandings of research participants, 2) the understanding of the researcher, and 3) the understanding that is elicited as a result of the active merging of boundaries, or the “fusion of the horizons” (Hekman, 1986, p. 145) of researcher and participants. It is this third type of understanding to which the researcher strives through a reflexive immersion in the data that remains from the experiences under study. As such, the task of the researcher is consistent with the Gadamerian sense of the hermeneutic problem, that is, the conjoining of the past with a present that moves before us—before us in the sense of preceding us, and before us in the sense

of opening up ahead. In this sense, understanding engages the data that precedes it at the same time that it engages new territory that the process of understanding must explore to complete itself.

The completion is, of course, incomplete, for it does not represent a concretized interpretation that can withstand the further engagement of the process that created it. It is the continuing historical contingencies that guarantee a never-ending emergence of new understandings, thus assuring the incompleteness of any single historically-contingent interpretation. Krippendorf (1994) points out that “understanding is *never finished*, even in the absence of objections from an environment. The process *directs itself*” (p. 85). What can obtain from such a ongoing process is an illuminative fit that reflects an understanding by the researcher and his participants that was co-determined. In recognizing this reciprocal selectivity³ of meaning, we may avoid the ontological labyrinth that leads either to the nihilistic denial of self or to the solipsistic affirmation that self is all there is.

Once such a view of understanding is achieved, there remains the question of how that understanding comes about in relation to the analysis of the data provided by participants. For it is our own understanding of how we come to understand that will affect equally any attempts to arrive at new understandings. What we begin with, then, is a methodology whose theoretical boundary (organization) shapes and is shaped by the specific network of interactions (structural components) that constitute a particular research study. Indeed, the epistemological dictum arrived at by Maturana & Varela (1987), “knowing is doing, doing

³ This term is used by Susan Oyama in *The Ontogeny of Information* (1985) to convey the interactivity that gives rise to conditions for the emergence of biological information.

is knowing” applies equally to a research strategy based on interpretive invention, or what may be termed hermeneutic constructivism. Thus, theory and practice are co-originating aspects of a single research phenomenon that resembles a spiral more than a hermeneutic circle⁴; for the spiral provides an multi-dimensional image whose recursive helical form represents the movement from non-understanding to understanding, from one level of understanding to another.

THEORETICAL BACKGROUND FOR RESEARCH PRACTICE

Constructing Interpretations

“The only things that can be known are those compatible with the existence of knowers” (Greenstein, 1988, p. 47). This statement signifies an assertion of the importance of observers by elevating “humanity's existence to the status of a principle of understanding” (p. 47). This principle is accepted by hermeneutic constructivism as an ontological condition rather than as a limitation affecting certain research strategies. Hermeneutic constructivism does not attempt to turn the researcher's perspective into a view from nowhere; rather, it demands a high degree of reflexivity by the researcher. Goffman (1974) succinctly points out that “a reflexive element must necessarily be present in any participant's clear-headed view of events; a correct view of a scene must include the viewing of it as part of it” (p. 85).

⁴ This distinction is necessary if we are to appreciate fully the enfolded nature of successive steps taken toward understanding the phenomena that are the subjects of inquiry. The spiral is indicative of the evolutionary nature of understanding that, once transformed, never returns to the same point from which it was transformed. This fact has as much to do with the irreversibility of time as it does with the historicity of those involved in understanding. This is not to suggest a resurrection of teleology based on a naive conception of progress; for if we follow our evolutionary metaphor far enough, we may see as many or more extinctions as we do survivors who have flourished through adaptive transformations.

As defined and used in this study, hermeneutic constructivism seeks to understand the experiences of Stokely Fellows and the transformations and transitions that punctuate those experiences. As a mode of social inquiry, hermeneutic constructivism acknowledges connections to a rich tradition of theory and research (Piaget, 1954; Glaser & Strauss, 1967; Blumer, 1969; Lincoln & Guba, 1985; Polkinghorne, 1988) directed toward understanding and interpreting social cognition and emergent meanings. As with other qualitative methodologies, hermeneutic constructivism accepts the notion that observation and dialogue are the primary tools of researchers interested in understanding the multiple realities of the social domain. Hermeneutic constructivism may be viewed, in fact, as a branching of the main body of research theory and practice that has grown from an understanding that some commonly-accepted principles of science are less applicable to the study of relations among humans than to relations among things (Lonergan, 1958; Polkinghorne, 1988).

Science and Experience

In charting new territory for social research, some qualitative theorists imply or proclaim that the goals and methods of science are incommensurable with understanding human experience. Doubtless this would be true if we were to restrict our understanding of the scientific enterprise to the reductionistic assumptions now considered outmoded by many scientists. In fact, new findings in the study of cognition, evolution, and non-linear dynamics (Varela, Thompson, & Rosch, 1991; Kauffman, 1993; Smith and Thelen, 1993) continue to break new ground that have ontological implications for how we think of learning,

information, order, and change. The unfortunate assumption has grown up among some qualitative methodologies that, since the methods of the natural sciences do not map onto social phenomena, then rigor and rationality are somehow suspect. Thus we inherit polarized research programs that are either scientific or experiential to the extent that each excludes the other. As Varela (1992) points out, however, coming to understand ourselves may require both science and experience:

To deny the truth of our own experience in the scientific study of ourselves is not only unsatisfactory, it is to render the scientific study of ourselves without a subject matter. But to suppose that science cannot contribute to an understanding of our experience may be to abandon, within the modern context, the task of self-understanding. Experience and self-understanding are like two legs without which we cannot walk (pp. 13-14).

The move away from natural science by qualitative research has been accompanied by a move toward the linguistic domain of the humanities. There seems to be the assumption that adopting the methodologies of literary criticism and history (Polkinghorne, 1988) may provide an alternative to reductionism.⁵ Clearly this is to resign oneself to a failure to look beyond the generally-accepted premises that historically have directed science (or at least the talking about science). By separating languaging from acting, there develops the risk of losing the

⁵ To quote Polkinghorne: "The human disciplines will need to look to those disciplines [literary criticism and history], rather than to the physical sciences, for a scientific model for inquiry of the region of consciousness." Since both literary criticism and history have largely ignored the compulsion to become "scientific," one may wonder how they are to provide scientific models for qualitative research.

material connection that links the linguistic domain to that which it describes. For even though explicit behaviors are no longer understood to be the sole human research source that behaviorists once claimed, human actions do, indeed, represent the other half of knowing. Without the reciprocal co-originators of knowing *and* doing, we are left without the reciprocating influences necessarily present for interpreting experiences that arise from participant actions and participant descriptions of those actions.

Between the Poles There is Much Latitude

The need for researchers to incorporate in their analyses both the languaging and acting of the researcher and research participants can be illustrated by Victor Turner's (1970) anthropological studies. Turner's example, too, provides an analogy to two polar theoretical positions within qualitative research: 1) the inductive phenomenological approach whose goal is pure description of participant experiences, and 2) the deductive ideological approach whose goal is to examine human experiences from a "grand" theoretical position. Occupying a middle ground, Turner's work further represents a research agenda based upon an "unrestricted desire to know" (Lonergan, 1958), rather than on more contemporary agendas predicated on an unrestricted desire to promote a chosen methodology or ideology.

Turner analyzed the structure and properties of ritual symbols of the Southern African Ndembu tribe. Taking the advice of anthropologist Monica Wilson, Turner added to the native interpretations those of Ndembu specialists and laymen. From these, he inferred three classes of data: 1) "external form and observable

characteristics, 2) interpretations offered by specialists and laymen, and 3) significant contexts largely worked out by the anthropologist" (p. 151).

It soon became obvious to Turner that "considerable discrepancy exists between the interpretations . . . offered by informants and the behavior exhibited by Ndembu" (p. 157). Instead of negating one or the other of the discrepant classes of data by ignoring it, Turner set about to understand how such contradictory phenomena could co-exist. In doing so, Turner was not only able to make sense of his immediate problem, but he also was able to shed light on the two opposing methodological principles, either of which taken alone short-changes the analysis process.

One position may be regarded as a purely-ethnographic position, attributable in anthropological methodology to Nadel, that ascribes no significance to a symbol if uncomprehended by the research participant. Turner argues that this delimiting approach can be attributable to the ethnographer's failure to distinguish *symbol* from mere *sign*. For a distinction between the two, Turner quotes Jung: "a sign is an analogous or abbreviated expression of a known thing. But a symbol is always the best possible expression of a relatively unknown fact, a fact, however, which is none the less recognised or postulated as existing" (p. 158). Signs are distinguished by their facticity, much the same way that Gordon (1961) describes the "decorative" metaphor as "after-the-fact (in that it does not discover but describes the already-discovered)." The symbol, however, is more akin to the productive metaphor that is "generative, inductive, before-the-fact—the initial leap in the process of discovery" (p. 104).

The second methodological position is exemplified by the psychoanalyst who ignores, or disregards as neurotic rationalization, the

patient's interpretation in favor of a highly-arcanic set of postulates based upon an understanding of unconscious drives or forces. Turner argues that this extreme on the methodological pole of meaning is no less limiting than that of the social anthropologist; for it is a position that ignores the social fact of the participant's interpretation in favor of an explanative regime far removed from the social setting.

Turner's solution to both methodological extremes urges that each position adopt more of the other. As for the conflicting character of participant descriptions and participant behavior, that solution Turner developed as part of a theory regarding the integration of the "sensory and ideological" poles of meaning of the ritual symbol. A symbolic ritual that thrives is one that satisfies both of these elements, and it is not uncommon for research participants (and researchers, too) to describe the ritual (experience) in ideological terms that conflict with the sensory element of the ritual practice. Both appear contradictory, yet essentially true:

Ritual . . . is precisely a mechanism which periodically converts the obligatory into the desirable. The basic unit of ritual, the dominant symbol, encapsulates the major properties of the total ritual process which brings about this transmutation. Within its framework of meanings, the dominant symbol brings the ethical and jural norms of society into close contact with strong emotional stimuli. In the action situation of ritual, with its social excitement and directly physiological stimuli, such as music, singing, dancing, alcohol, incense, and bizarre modes of dress, the

ritual symbol, we may perhaps say, effects an interchange of qualities between its poles of meaning. Norms and values, on the one hand, becomes saturated with emotion, while the gross and basic emotions become ennobled through contact with social values. The irksomeness of moral constraint is transformed into the 'love of virtue' (p. 162).

Hermeneutic constructivism, too, does not seek to inhibit the researcher's "unrestricted desire to know" by a set of prescribed conventions intended to take precedent over the context within which the researcher operates. Rather, hermeneutic constructivism attempts to provide the methodological relations from which insight, understanding, and judgment may emerge. In this regard, it resembles literature or scientific invention more than literary criticism or scientific method. Hermeneutic constructivism is less dependent upon lists of rules than upon the accumulation of insights for the construction or enactment of understanding and sound judgment. As Meynell (1978) points out, "insights are themselves the origins of rules" (p. 9).

Hermeneutic constructivism draws from modern hermeneutics (Lonergan, 1958; Gadamer, 1976), the natural philosophy inherent within the principles of *autopoiesis* (Varela, 1980; Maturana & Varela, 1987, Goodwin, 1994), and the new complexity sciences that focus on the study of dynamical systems (Haken, 1988; Thelen, 1989; Waldrop, 1992; Smith and Thelen, 1993). By looking to hermeneutic philosophy, biology, cognitive science, and non-linear dynamics, hermeneutic constructivism hopes to make explicit the scientific underpinnings reflected in an interpretive philosophy and the philosophic

underpinnings reflected in an emerging science. The fact that these strands of science and philosophy focus on understanding self-organizing and adaptive transformations within organisms and social groups provides the rationale for its selection and tailoring in researching the transformational experiences of individuals within learning environments. And both the science and the philosophy share the larger goal of qualitative research to better understand and interpret human affairs.

Origins of Self-Organization

"Hermeneutics, like freedom itself, may not be compatible with ontological security." Gerald Bruns

The idea of self-organization within biological and social systems is not new. It is at least implicit in the Western tradition since Giambattista Vico, the Italian philosopher who provided a much-neglected alternative to the scientific rationalism of Descartes (von Glasersfeld, 1984, pp. 27-31). Vico was born shortly after the death of Descartes, whose influence by that time was evident in the stampede of scientific thinking away from philosophy and experience and toward mathematics. This mathematizing of science eventually secured for physics, the most mathematical of the sciences with a foot still in the door of real objects, the authoritative voice that was eclipsed only by that of religious dogma.

Vico's writings focus on the relationship of social realities to theoretical ideas, and his concerns regarding the rise of scientism were reflected in works on education, law, and the conduct of the scientific enterprise. The contrast between Vico and Descartes is an important one

to note because, in many respects, it mirrors current theoretical distinctions that can be made between the positivist/reductionist approach to science and the emergent sciences concerned with complexity. Essentially, Vico did not argue against the analytical methods developed and synthesized by Descartes, nor did he argue against the derivability of truth. If Descartes and Vico were alive today, we might see one concerned with statistical significances and the other with the measure of meaning.

Whereas Descartes sought truth through innate ideas and logical reduction, Vico defined truth through its invention. Vico asserted the *verum-factum* principle, which claims that “people know only what they make” (Vico, 1988, p. 6). “According to Vico, we have true knowledge when the thinking and doing are performed by the same person. Man, who is the maker of his own history, can ‘cognize’ it; knowledge is tantamount to operation (Vico, 1990, p. xlii).” If such claims did not clearly distinguish Vico's impertinence in the eyes of Cartesians, he went on to point out that we have mathematical knowledge, in fact, because we construct it.

Vico's ideas emphasizing the social and historical nature of reality were, not surprisingly, swept away in the rising tide of scientific rationalism that came to occupy the same position as the religious dogmas they were to replace. That Vico's ideas survived and are being revived is evidence of his contribution to the continuing interest in the possibilities for science to contribute to our own understanding of the social and historical realities that we configure and that we are configured by.

From Simplicity to Complexity

For it is the science that studies it that specifies the nature of the object.
Harry Redner

Only recently has there emerged approaches within the natural sciences that provide an alternative to the reductionism that has dominated science since the Enlightenment. This new approach, which is being mapped within numerous scientific disciplines, studies systems that exhibit behavior that is dynamical, adaptive, and autopoietic. Table 1 presents Redner's (1994) summary of thirteen points made by Morin (1982) in distinguishing the "paradigm of complexity" (PC) from "the paradigm of simplicity" (PS) (Redner, p. 375).

Even with the recent developments of complexity theory that merge the study self-organizing, adaptive systems with the study of unpredictability within deterministic systems (chaos), the classical model of simplicity remains dominant in the sciences. As the social sciences have developed using methodologies aimed at prediction and control, it now becomes ever clearer that the effect has been a preponderance of an abstract empiricism (Mills, 1959) that portrays complex social systems as static rather than ever-changing. Prediction, in fact, became possible by ignoring the unpredictability emanating from the world of change.

The discovery that prediction is possible only in linear, closed systems has led to new problems and possibilities for the study of non-linear, open systems that occur in the biological and social domains. Chaos theory has demonstrated that sensitivity to initial conditions precludes long-range prediction (Gleick, 1987) in dynamical systems such as weather systems, economies, and ecosystems. Even though these systems are deterministic on a large scale (it is not going to two hundred

Table 1. Scientific Orientations of Simplicity and Complexity.

Paradigm of Simplicity:	Paradigm of Complexity:
adheres to the principle of universality and treats all individual and local phenomena as residual and contingent	without denying universality, also adopts the complementary principle that the individual and the local are intelligible in themselves
rejects temporal irreversibility and, in general, the historical	seeks to bring irreversibility into physics, biology and systems theory so as to give events in these fields a temporal direction
seeks to reduce wholes to their simple constituents	integrates elements into their ensembles or complexes
seeks for principles of order within organised complexes	looks for self-organization
employs linear causality	searches for principles of causal interrelations
assumes total determinism and thus excludes chance	allows for chance in its 'dialogic' of the process order-disorder-interaction-organization
isolates the object from its environment or context	places the object back into interaction with its environment or context
separates subject from object, observer from observed	puts the observer back into the experimental situation and relocates human subjects into their normal environments
ultimately eliminates the subject from objective scientific knowledge	provides for a scientific theory of the subject
eliminates being and existence through formalization	pursues a view of self-organization and self-production which enables being and existence to be acknowledged scientifically
does not recognize autonomy	considers autonomy in terms of self-organization and self-production
treats contradiction as error and logic as absolute	sees logic as limited, and regards contradictions and paradoxes . . . as indices of a deeper reality
thinks mono-logically	thinks dialogically and so relates contrary concepts in a complementary manner

degrees in Los Angeles), an unpredictability emanates that is based on the dynamical nature of local interactions. This reality of unpredictability has begun to affect the focus of research in many areas. The move is from the prediction and control of populations, ecosystems, or economies to an understanding and explanation based upon close attention to the patterns of interacting components of these systems. As for educational research, Cziko (1989) suggest that research may be aimed at attempts

. . . to describe, appreciate, interpret, and explain the social and individual behaviors as well as the cognitive processes relevant to understanding educational phenomena. . . and that . . . at the macro level, such research could involve the descriptive and interpretive study of educational contexts . . . (p. 23).

From the reciprocating influences derived from areas of study concerned with dynamical systems, a new dialogue has begun to examine what constitutes life, cognition, learning, and evolution. It is an interdisciplinary dialogue that focuses on the self-organization of complex adaptive systems, from the cellular to the social level. Often combined under the umbrella of complexity studies, this new scientific approach engages a dialogue and research program that challenges the Cartesian dualism that sets apart mind and body, subject and object, individual and community, organism and environment. Complexity predicts unpredictability in the world of organisms-in-environments. Complexity has as its goals observation, insight, understanding, and interpretation, all of which take place within a recursive loop as

organisms-in-environments experience ontogenetic development (development within a lifetime). Complexity looks for general laws of pattern formation (Waldrop, 1992, p. 298) from the molecular to the social to the cosmic level.

Where this new approach to studying the origins of organization will leave the two methodologically-isolated camps of the social sciences, we can only speculate. It may be that a new methodology will emerge, one that combines the interests and rigor of science with the essential reality of experience—a social science that recalls its history not as social engineering but as an active search recursively driven by a practice and theory intended to comprehend and explain the complexity of social life. It may yield a design that views its own existence as self-organizing and adaptive—and, thus, more likely to comprehend paths to the evolvment of a dynamical society and more able to understand the changes that continue to characterize that society as a living system. Finally, it may be a social science whose evaluation and assessment models can be used to study and design organizations whose relations provide the latitude for the full engagement of autopoietic possibilities of its members.

Hermeneutic constructivism may be seen as an attempt to locate, understand, and explain those pattern formations that enable self-organized enaction of new learning within exploratory learning communities. In drawing heavily from the insights of both the sciences of complexity and hermeneutic philosophy, we must remain aware of the dangers associated with loose analogizing. After all, such analogizing by the early social sciences has been construed as “physics envy” (Bygrave quoted in Wheatley, 1992, p.141) for good reason. Such scientific grafting onto accounts of lived experience may appear dangerously

speculative if we were unable to provide concrete examples of learning situations that clearly demonstrate the principles of self-organization of complex adaptive systems. The findings of this dissertation are constituted by such examples.

From this re-focusing of the social research process toward the probabilities for emergence and enaction of meaning, we may hope that the methodologies involved will also take on the characteristics of enaction—that they will become integrated within the recursive evolvment of the social phenomena that are the subjects of study. By doing so, social science may minimize the overwhelming tendency toward reification of its own boundaries, which, in essence, ignores the structural contexts to which it must remain sensitive in order to sustain viability.

APPLICATION OF THEORY IN RESEARCH

Data Collection

The primary data collection method for the research was in-depth interviews conducted with twenty former Stokely Fellows randomly selected from those who volunteered to participate in the study. Interviews were intended to obtain a detailed first-person descriptions of the participants' experiences during the Institute. Because the role of the interviewer is seen as a "non-directive listener," (Thompson, et al, 1989) questions did not proceed from a rigid format, even though some areas for exploration were pre-established. The interviewer only formulated follow-up questions based on verbal and non-verbal cues. The interviewer attempted to gain the confidence of the participants by providing latitude for open discussion of topics important to them. By relinquishing his own

ontological priority, a sense of personal equality was established between the researcher and the participants that encouraged a free and open exchange.

The unstructured interview technique lends itself well to research aimed at understanding emergent meaning. Thompson, et al (1989) summarizes Kvale in pointing out that

. . . the interview is perhaps the most powerful means for attaining an in-depth understanding of another person's experience The dialogue tends to be circular rather than linear; the descriptive questions employed by the interviewer flow from the course of the dialogue and not from a predetermined path. The interview is intended to yield a conversation, not a question and answer session (p. 138).

Interviews were recorded on audio tape and later transcribed verbatim by the researcher.

Personal documents of the participants from the Stokely Institute also were used for understanding participant perspectives prior to, during, and after the Institute. Prior to and during the Institute, several pieces of writing were requested from each participant. The first was an essay in which the applicant was asked to reflect, in a five-hundred word essay, on his reasons for applying to the Institute. These essays provide information on initial perspectives that the Fellows brought to the Institute. Essays were submitted voluntarily, and written permission was granted for the use of any selections from these essays in the final study. The other documents

used were interim and final evaluations of the Institute, and these were provided by the Director of the Stokely Institutes. Permission to use these documents was also granted by participants.

Participants

All participants were classroom teachers whose years of teaching experience ranged from four to twenty years. Participants comprise a sample of twenty Fellows from 1986 through 1992, a time frame that includes all of those Institutes conducted under the same curricular format. Five participants were males, fifteen were females. Fourteen of the participants were high school teachers, one a middle school teacher, and five were elementary school teachers.

Interview Contexts

Interviews were conducted at a number of sites over a period of five months. All interviews were arranged for the convenience and comfort of participants, and most were conducted at participants' homes. All participants were contacted by telephone to arrange the interviews, and each was asked to allow approximately ninety minutes for the interview.

The fact that the interviewer was a former Fellow appeared to reduce anxiety. A sense of camaraderie based upon shared experience was evident, and participants seemed to welcome an opportunity to reflect upon their experiences. The participants indicated a willingness to share their experiences, and some participants became emotional to the point of tears during the interviews. The interviewer was welcomed in all cases.

Research Questions

Many of the qualitative research questions within the social sciences address what Lonergan (1958) identified as the “known unknown,” a defined area of investigation to which the need for new understanding is directed. Identification of the “known unknown” signals a breakdown in the researcher preunderstandings which, in turn, necessitates further insight.

The purpose of this research was to ascertain how and what changes occurred in the professional and personal lives of Stokely Fellows. Specifically, this research proceeded from these essential questions: 1) what changes did participants experience, 2) was there anything about the Institutes that facilitated the emergence of change, and 3) what personal and professional effects did the Stokely Institutes have in the lives of the participants.

The goal of the study has been to convey a coherent expression of those significant experiences generated through the Institute that led to transformations and transitions among the participants. A major focus of this research has been to understand how these transitions occurred and how they continue to configure the lives of the participants.

Data Analysis

The dawning organization of something new throws into confusion something that had been simple before. Eleanor Duckworth

Data analysis ensues when the researcher begins to interact with the data. The probability for the researcher to engage illuminative insights, clear understandings, and interpretative judgments will be influenced by the level of continuing interactions between the researcher and the data.

The transformation of passive data to active information proceeds from the overlapping of insights, understandings, and judgments that are iterated throughout the process from the initial immersion to the final draft of the report. The analysis of the Stokely data began prior to the interviews with the reading of Stokely application essays and assessments of the Institute. Analysis continued through the interview and transcription process, becoming most concentrated during the repeated readings of transcripts and identification of data chunks that indicated the formation of patterns that spanned participant descriptions.

Immersion

Immersion signals a level of interactions between the researcher and the data that is sensitive to the beginning conditions for interactions, and to quantity and variability of those interactions. This approach is consistent with heuristic inquiry (Moustakas, 1990) that emphasizes the immersion of the researcher in the research process. Immersion indicates a sensitivity to context, thus allowing for the emergence of insight, understanding, and interpretation while maintaining the integrity of the lived experiences of the participants. Immersion signals that the research process, from initial encounters to the writing of the report, is co-determined by interactions of researcher and research participants. From initial interviews to the repeated contact with languaged accounts of the participant experiences, the researcher “opens himself to the text by listening to it and allowing it to assert its viewpoint” (Gadamer, 1976, p. xxi).

As a former Stokely Fellow, the researcher brought a level of empathy and understanding that made immersion into and analysis of the data a natural outgrowth of the initial experience. The researcher's own experience provided a constant source for comparison during all stages of the process. This constant comparison, in fact, was helpful in maintaining an immersed level of interaction—rather than a submersed level. Whereas immersion signals levels of rich interactions that enable the researcher to discern patterns and construct connections far beyond early preunderstandings, submersion indicates a chaotic level of interactions. At a chaotic level of interactions, insights and understanding, which occur as a result of making distinctions within a background of action, become blocked by the inability to distinguish sameness from difference. And as Bohm (1980) has pointed out “to be confused about what is different and what is not is to be confused about everything” (p. 16).

Insight

... true insights may have been turned into something false and misleading by the procedure of learning mechanically through conformity to existent teachings, rather than through a creative and original grasp of the insights implicit in such teachings. David Bohm

Insights initiate analogies and metaphors that move the research enterprise forward. Glaser & Strauss (1967) point out that “the root sources of all theorizing is [sic] the sensitive insights of the observer himself.” (Glaser & Strauss, p. 251) They further indicate that, while the researcher generates insights during the research process, insights may occur prior to or outside the research and may be derived from another's experience or from existing theory (pp. 252-253).

Insights signal the beginning of new understanding and require the proper symbols to make that understanding explicit. These symbols, or generative metaphors, are descriptors of the implicit that seeks expression. They explore an emergent property whose artifactual trace is in the words, images, or actions that vivify the known unknown, whose boundary moves outward as our mapping proceeds toward it. This realization is at the heart of all discovery and invention, whether scientific or poetic.

The blocking of insights or the standing apart of horizons is proportional to the imposition of pre-formed hypotheses. This is not to suggest a total dependence upon induction. Hermeneutic constructivism engages both inductive and deductive reasoning in experiential studies. By doing so, it avoids the methodological aridity that provides the basis for arguments arising from the stubborn adoption of either the confirmatory or explanatory modes that are both engaged in coming to understand. To begin with preunderstandings that shape our hypotheses is evidence that we are alive within a tradition, but to allow those hypotheses to intrude upon the capacity to expand understanding through interpretation is to deny the reality that constitutes the consensual domain to which we contribute. On the other hand, an appeal to data alone ignores the situatedness of the researcher's experience within an "observer community" (Varela, 1979) thus separating data from our perceiving and conceiving of it that is necessary to obtain new boundaries for understanding the subject of inquiry.

Insights are complex phenomena that may be arrived at from different directions: 1) insights may result as a stable state moves in a centrifugal direction, entering a level of interaction with persons or data

that bring into question conceptions or preunderstandings that no longer provide a workable base for understanding the current context, and 2) insights may occur from a chaotic state moving in a centripetal direction from a perceptual overload to a level of interaction from which distinctions once again become possible. Blumer (1969) viewed these centrifugal (deductive) and centripetal (inductive) movements toward insight as resulting from the co-determination of perception and conception:

When, in a situation, perception is insufficient, one can conceive the situation in a certain way and act on the basis of the conception. In such a case, conceiving serves the same biological function as perceiving; it permits new orientation, a new organization for effort, a new release of action. Further, if conceiving originates in the breakdown or insufficiency of perceiving, it, in turn, flows back into perceiving, that is, the conception one forms will shape or influence the perception one gets. Conception is not merely a stop-gap to perception, but a fashioner of perception.
(p.155)

It is, after all, the continuing recursive dance between induction and deduction, between the novel and the confirmatory (Kuppers, 1990), that distinguishes hermeneutic constructivism from methodologies that depend primarily upon one or the other modes to legitimize observations through the extraction of the observer from that which he observes.

The approach by the researcher may be deliberate or hastened toward the level of interactions that provides the greatest opportunity for

insights to accrue. Insights, however, are not gradual; they are sudden. In terms applied from gestalt psychology and complexity theory, levels of preunderstandings that are too ordered for insights to occur represent a need to move toward the data. On the other hand, an interaction level with the data that removes the grounding from which distinctions may be made is too "anarchic" (Barlow & Waldrop, 1994) for insights to occur. When the interaction level with participants and/or data attains the boundary between order and chaos, insights are likely to result. Insights, then, are not a mixture of order and chaos; rather, insights derive from "order and chaos in a kind of dynamic tension" (p. 217). Insights signal the recognition of patterns that are not yet defined or understood.

Coherent Patterns

Only when a man attunes his ear to recurrent themes in the monotonous flow does the universe begin to make sense to him. George Kelly

Maturana & Varela (1980) have pointed out that "the basic cognitive operation that we perform as observers is the operation of distinction" (p. xix). It is the grouping of distinctions into patterns that initiates coherences for insights related to descriptions provided by research participants. As transcribed accounts are questioned further, initial groupings of patterns into categories sometimes dissolve as others are formed, or they are incorporated into more or less encompassing patterns.

A proper examination of data depends upon an identification of relevant facts among all participants and categorization of those overlapping statements in such a way that a coherent pattern is identified, a pattern that connects the understandings of individual participants.

Relevancy is established by the participants themselves from within the dialogue that transpired during data collection. This underscores the crucial importance of sensitive questioning to encourage the emergence of what is figural for the participants regarding the events that are the subject of inquiry.

The recognition of patterns does not guarantee coherence, just as the occurrence of insight does not insure clear understanding and sound judgment. Yet as Lonergan (1958) has noted, understanding does not accrue without the occurrence of insight, which, in itself, signals a level of interaction between researcher and data that allows for the transformation of facticity to significance (meaning). It is through the continued appeal to the data that significant patterns are judged as coherent or incoherent, and if they are judged incoherent, then the researcher is faced with examining his own preunderstandings or conceptualizing schema. At all times the researcher is challenged to maintain open interactions with the data, to preserve the integrity of participant accounts, and to render an interpretation that is consistent with available data.

As insights accrue from the researcher's immersion within the data, the veracity of insights depends upon the data for substantiation. Not all insights are verifiable. By comparing the individual meanings generated from an interactive examination of the accumulated data, overlapping meanings become evident in the languaging of the participants. These overlaps provide the regularities that form the coherent patterns that will comprise the shared "narrative gravity" (Dennett, 1991, p. 429) of the participants' experiences. These gravitational centers or attractor states form the languaged record for understanding the evolution of meaning.

Patterns become coherent through accumulated recurrences and by sensitive categorization that preserves their distinction. Categorization reduces redundancy through the compression of data, such that summary statements may be derived that concentrate these coherent patterns into descriptions. These descriptive statements indicate understanding.

Hyperqual

In the present study, the search for patterns was assisted by the use of Hyperqual 4.3 (Padilla, 1991). Having transcribed the audio tapes into Hyperqual, the interview data for each participant was available for searching. Figural words or phrases from individual transcripts could be searched through the "find function" of the computer program to determine recurring uses of the terms or phrases within and across interviews. If the search indicated a pattern of usage, these words with their surrounding data chunks (contexts) could be tagged and stacked together as exemplars of an emerging pattern. This procedure proved extremely useful in accessing and organizing data, as well as in merging data from multiple contexts. Hyperqual also utilizes a numbering system to tie each exemplar back to its original source. This numbering system is retained in the dissertation for the convenience of checking original data sources.

Interpretative Judgment

*To know is to evaluate through our living, in a creative circularity.
Francisco Varela*

*Now the all-inclusive term of meaning is being, for apart from being there
is nothing. Inversely, the core of all acts of meaning is the intention of
being. Bernard Lonergan*

Interpretation is the act of making sense of that which was previously unknown. As verification of insights assures understanding of participant experiences that begin with our descriptions of them, understanding anticipates the need for reflection which, in turn, becomes the vehicle for arriving at interpretative judgment. Why reflection should be a need can be answered only if we accede to the notion that the construction of meaning is a human necessity arrived at by critically examining our own understanding of events or experiences that are the subjects of inquiry. Whereas understanding indicates a grasp of the reality of being, interpretation arrived at through critical reflection signifies a grasp of that reality's meaning—or the “intention of being” (Lonergan, 1958, p. 358). Lonergan (1958) makes clear this distinction between describing and interpreting:

But description is not enough. If it claims to report data in their purity, one must ask why the arid report should be added to more lively experience. If it pretends to report the significant data, then it is deceived, for significance is not in the data but accrues to them from the occurrence of insight. If it urges that it presents the insights that arise spontaneously, immediately, and inevitably from the data, one must remark that the data alone are never the sole

determinants of insights that arise in any but the infantile mind and that beyond the level of insight there is the level of critical reflection . . . (p. 415).

Understanding provides us an accurate description of experiences that reside within the explicitness of our past. Interpretive judgment, as an act of purposive reflection, offers us meanings that may contribute to the configuration of all that we anticipate. In this sense, interpretative judgment provides us descriptions of the implicit.

Interpretative judgment completes the hermeneutic spiral in the sense that understanding is moved to a new level that is open to our past—as we reflect upon our understanding—and open to the future by assuming an “implicate order” (Bohm, 1980) that sustains the possibility for the occurrence of future insights. Interpretive judgment, then, assumes an evolutionary role in the history and transformation of knowing. Von Glasersfeld (1984) makes this connection by pointing out that environment, alone, does not determine our insights or construction of reality. Certainly dinosaurs did not appear because the environment necessitated these particular structures, but because the environment provided the latitude for their self-organized emergence. Likewise, the demise of either dinosaurs or interpretations does not come about because of a failure to match the criteria for the survival of the fittest or for the only true interpretation, but because they do not fit the minimal demands for survival or believability that arise from the current context. Environment provides limits within which we certainly must operate, but these minimum standards do not preclude the potential for new and unexpected combinations that may, indeed, produce a more beautiful fit

within the boundaries of our existence. Interpretive judgment is critical in the evolution of understanding, for it is from within the contexts of the meanings we construct that the on-going need for our adaptation is delineated.

Ethical Interpretation

It would be easy enough to paste onto hermeneutic constructivism some "oughts" that would qualify as soundly platitudinous in the sense of doing the right thing by research participants. In conceiving a research strategy that is both self-organizing and reflexive, platitudes become unnecessary if we take seriously the ontological grounding of the consensual domain or "observer community" (Varela, 1979) of which we are the necessary components, i. e., researchers and research participants. It is, then, the interactive and reflexive practice based upon such recognition that instantiates the ethical ideal. For if the systemic view that provides the basis for our interpretation holds, then neither researcher nor participants maintain, as Thelen (1989) suggests, an ontological and, thus, an ethical priority. This realization yields a research practice in which humans are not subjected to research but become co-participants in the understanding of their own meanings that are both explicit and implicit in the accounts they provide.

It may be argued that what is only explicit should be the subject of interpretation—that the implicit should remain so, for fear of misinterpreting that which is only suggested and not clearly stated. This is surely a considerable challenge that requires a degree of patience and insight that would not be necessary if our intent were simply to report

that which is already there before us requiring no interpretation. But, of course, that is not the intent of hermeneutic constructivism, which does not attempt to represent a reality that is independent of the meanings we attach to that reality.

The implicitness of which we speak is a quality of the experiences that participants describe, which are themselves subject to the same limitations that we as researchers experience in interpreting their descriptions. What we have, essentially, are descriptions by a researcher of descriptions arrived at through conversations between researcher and participants. Given all these symbolic layers separating us from the experiences we set out to investigate, one may wonder of what value is our interpretation placed atop another set of interpretations. Fortunately, we may be forgiven for our incapacity to exceed our limitations as cognizing subjects. For as much as we aspire to the *thing* itself, the *thing* remains that ineluctable non-contrivance whose essence we can only symbolize in carefully constructed linguistic artifacts that are regularly elucidating and sometimes confounding.

Since the parameters for social interactions reside within a system such that an explanation on an operational level (*Erklärung*) is not possible (Varela, 1979), we are left without a manipulative or control alternative for our research (even if that were the goal). What is available to us is a level of explaining and understanding (*Verstehung*) that is constituted in interpretation. Rather than being able to comprehend the self-organizing and adaptive operations of the individual social entities within the larger community of the Stokely Institute, we engage a level of description and interpretation that is symbolic rather than operational. This mode of explanation is used not only in understanding the vagaries

that characterize social interactions: symbolic explanations are used in understanding biological phenomena (Varela, 1979) that regularly display high degrees of complexity and novel change.

Thus, the interpretations that derive from lived experience are communicated through symbols that we choose to characterize a process that would otherwise remain unknown to us. This is accomplished through an examination of interactions among participants whose lived experiences, themselves, remain beyond the scrutiny of an observer. Here, the observer readily concedes the difficulty posed in deriving direct causal explanations for a complex system within which he is embedded—and the folly of attempting to derive a true understanding if he were otherwise.

CONCLUSION

If what has been outlined here as hermeneutic constructivism pretends to be a science, one may ask what separates this science from the “abstracted empiricism” (Mills, 1959) of the social engineering sciences whose reliability and validity are judged to be in direct correlation to a thorough absence of human insights. If hermeneutic constructivism claims the status of art, one may question the reasoning behind the meticulous chronicling of everyday experiences whose sober, factual redundancy would not be found in the most amateurish of literary accounts. If we can accept that hermeneutic constructivism aims at an imaginative accounting within a rigorous reflexive search, the answer to both questions lies in the scope of the inquiry or in the focus of the investigation. For we are looking at interactive systems that provide clues

to the understandable linkage between behaving and thinking, between “data of sense and data of consciousness” (Lonergan, 1958). What we have a glimmer of, then, is a hermeneutic social science whose intent is not social engineering but the discovery and enactment of the art of social living. As such, our intent is not control within the reified parameters we inherit but the exploration of our own limits within the consensual domain that we, as autonomous actors, shape and are shaped by.

Another criticism that is potentially more profound has to do with applying a theory like complexity or dynamic systems theory, themselves cross-disciplinary and not fully developed, to another domain of research that is not fully developed—hermeneutic constructivism. We know the pitfalls associated with applying assumptions and methodologies from one domain to another, and the development of the social sciences through the application of physical science methodologies provides an example not easily forgotten. The great challenge and the potential reward associated with blending complexity and hermeneutic constructivism may be the construction of suitable language and methodological approaches that will not misapply principles that are appropriate for other domains. Smith & Thelen (1993) point out this perceived problem in their discussion of the current state of dynamic systems theory:

. . . [dynamic systems theory] is being used by researchers and theorists for many different levels of analysis, for behavior ranging from the physiologic to the social, and for describing change over time scales from seconds to years. We see this diversity, however, not as a failing of the approach, but

indeed as its real strength. . . we are now alert to the pitfalls of explaining too much by single, overarching organization. It seems to us that the future of [dynamic systems theory] will lie with very general principles of process and change, applicable in many domains, over many levels and time scales, but also allowing the multiple local details to emerge from the necessary empirical work (p. xii).

The task, then, will be to use the emerging principles of a science concerned with the study of dynamical open systems to inform and become informed by studies that share the same horizons. This does not mean that research questions should be constructed such that complexity may provide the answers. This would, indeed, replace our goal of new insights, understanding, and interpretation with that of confirmation. Complexity may establish some broad, movable boundaries within which different methodologies may evolve. In this sense, complexity will not function as a grand theory but as an evolving template similar to Warren McCulloch's vision of an "experimental epistemology" that does not separate knowing from doing.

Chapter 4

The “Stokely Experience”

I think the inquiry thing was what the Institute was all about, and that was right down my alley I enjoyed the Institute because it encouraged us in that way . . . to really not just receive information. (15327)

INTRODUCTION

I think there is so much opportunity for self-growth, self-development--you really kind of become a different person, I think. (12305)

Understanding and appreciating the participant descriptions and meanings of what has come to be known by former Stokely Fellows as “the Stokely experience” requires attention to: 1) the organizational relations, or relational space, that provided the closure necessary for self-organized learning to occur, and 2) the structural components that provided the network of interactions and transformations that constituted this learning community from year to year. The findings, then, focus on the co-production of relational space and structural components as two aspects of a unitary phenomenon that characterizes the self-sustaining and self-generating behavior of dynamic and self-referential systems. Attention centers on how these aspects established, within a larger environment, the reciprocal shaping influences that resulted in transformative insights and emergent meanings that continue to configure the lives of former Fellows.

The emergence of multiple meanings came about from within the relational space that the self-organized network of interactions and transformations produced and sustained. As the Stokely Institute

maintained its relational space from summer to summer as a collegial and open forum for personal and intellectual exploration, each Institute was entirely different, since it was new components and new sets of interactions that determined the "texture of the space" (Varela, 1979, p. 261) in which the Institute operated. It is this co-production based upon organizational closure and structural plasticity that made each Institute unique as a self-organizing community of learners.

From its inception in 1983 until it was discontinued following the 1994 Institute, the relational space remained consistent over the years, thus providing the operational closure that is characteristic of self-organizing systems. As a closer look indicates, this closure was necessarily maintained in order for participants each year to experience the renewal and change that became a typical outgrowth of the Institutes. For while the components that included participants, faculty, and program determined "which [were] the possible interactions the system [could] enter into" (Varela, p. 261), the components also acted as agents for the preservation of the relational space when interactivity and openness were threatened. In doing so, the interactions of the components kept alive the capacity for the Institute to adapt in ways that assured a continued and expanded contribution to the growth and renewal of its individual participants and, thereby, a continuation of the Institute's mission. The realization of this self-organizing element within the Stokely community is more than trivial in coming to understand the emergence of autonomous learning by the Stokely participants.

Figure 1 provides a schema that represents the *relational space* and the *structural components* that comprise this interaction system. The longitudinal lines indicate the structural components that defined the

contexts through time. They include: 1) the Stokely program, both curricular and non-curricular; 2) the Stokely faculty and staff; and, 3) the Stokely participants. The latitudinal lines represent the relational space. They are: 1) supporting, 2) challenging, 3) opening, and 4) integrating. The open interactions among the structural components within the constancy of the relational space produced the self-organized communities of learners of the Stokely Institutes. Each quadrant within Figure 1 indicates a zone of influence that was formed at the intersection of structural components with relational space. These *zones of influence* form the basis for discussion in the findings that follow.

The areas that are contiguous to the poles of Figure 1 represent *fields of coherence* for participants, staff, and program; and each field of coherence may be thought of as a domain for the coalescence of emergent meanings as derived from the descriptions and interpretations of the participants. Each field of coherence, then, can be seen as an attractor for either synoptic (personally significant) or instrumental (professionally significant) meanings. Whereas *instrumental meanings* become translated to aspects of professional development and pedagogy, *synoptic meanings* signify transitions and transformations that extend beyond career to configure other aspects of the participants' lives. These include renewal, confidence, accomplishment, hope, and learning as expansion of self.

The remainder of this section will examine 1) the zones of influence formed as relational space (supporting, challenging, opening, integrating) and the structural components (program, faculty/staff, participants) came together in a network of interactions to constitute the Stokely experience, and 2) the fields of coherence from which emergent meanings coalesced.

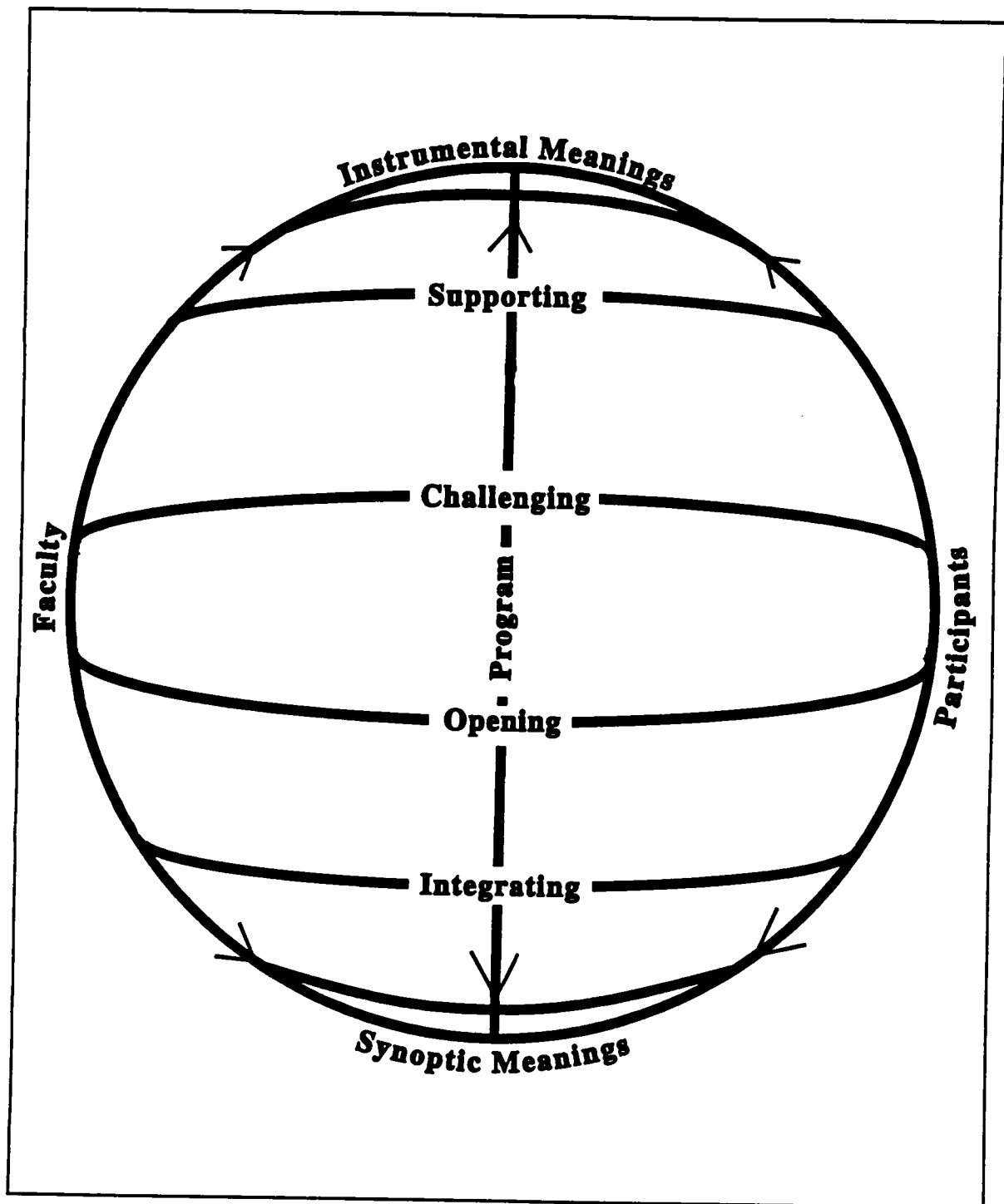


Figure 1. Schema for the self-organized interaction system of the Stokely Institute.

What will soon become evident in this presentation of findings is that the zones of influence and fields of coherence reside within imagined demarcations that are used for the purpose of making distinctions within time and space. In the descriptions by the former Fellows and in the comments regarding those descriptions, one may find zones and fields bleeding, vanishing, or appearing crisply defined. This may be expected, for inasmuch as these demarcations are imagined, their degree of reality is contingent upon how well they aid the writer and the reader in navigating the multiple dimensions of meaning that are both explicit and implicit within the world of data and the exploration of it. If parts or all of our global metaphor begin to break down, as every generative metaphor will (Gordon, 1961), one may at least hope that our temporary scaffolding was sufficient to attain the next level of insight, from which further metaphors may be constructed to help extend our understanding.

SUPPORTING

The word “supporting” is intended to represent that relational space of the Institute that provided for the comfort and safety of the participants and the freedom from the normal responsibilities associated with everyday living. As with the other relational boundaries to be discussed, “supporting” came about through the interactions of program, faculty, and participants—those components that produced the network of interactions that provided the self-maintenance and self-generation of the learning community.

The Program Component

It succeeded masterfully as far as strengthening your love of learning.

(15327)

The Stokely program was intended to allow participants to become “immersed in learning and scholarship” (Fellows Program, 1988, p. 7). As a residential program, Fellows lived together in University housing during the Institute that usually extended from late June through July. During this time, the program provided a broad range of readings that became the focus of interdisciplinary seminars and informal study groups. Plays, concerts, dinner parties, films, field trips, and lectures by visiting professors were interspersed within the five weeks so that each Fellow became a “full and active participant in all phases of the program” (p. 7).

Setting the Stage

In talking about the planning that preceded each Stokely Institute, one participant referred to “the stage being set for personal thinking, for personal reflection about teaching, about philosophy, about history, and science” (10743). It is clear that setting the Stokely stage was a complex process that sought to sustain the opportunity for self-organizing communities of actors to come together within a creative dialogue. One of the participants made this point when she said

I think they did a wonderful job of putting things in place.
And then I think they did a wonderful job of letting what
happened, happen so that you not only have the wonderful
comfort of knowing that's [open aspect] planned, but you

have a freedom to get from it what you need, what you want from it (16282).

As metaphor, *setting the stage* seems particularly appropriate, for each Institute encountered logistical problems that would be faced in preparing for any major production. There were professors to be contacted from previous Institutes, and sometimes tryouts had to be conducted for new ones. Once this was done, an intellectually-rigorous curriculum had to be written that would provide an integrated structure and maximum latitude for improvisation by the professors and the other actors. It was necessary to order books and journal articles for all participants. Seminar rooms had to be arranged so that each participant could share center stage. Guest appearances by other faculty members were scheduled. Visits to other departments within the College had to be arranged.

Participant tryouts came next, followed by the careful selection process. Accommodations for a five-week run were ordered, with two participants sharing a two-bedroom university apartment. Stipend checks of five hundred dollars each were written to each Fellow to cover meals and incidental expenses. Name tags, parking permits, personalized notebooks, books, articles, and fruit baskets had to be on hand for the participants' arrivals. The University Records office had to be contacted to record six semester hours of graduate credit for each Fellow. Beyond these preparations, there was the need to provide tickets for cultural events in the area. Transportation had to be arranged for field trips, as well as for any participant who could not walk to and from seminars. Opening and closing dinners at the faculty club had to be orchestrated.

Catering had to be ordered to celebrate any participant birthdays that coincided with the Institute. Personalized certificates and plaques had to be ordered.

During the eleven years that the Institute operated its residential program, Dr. Lynn Champion served as Director. It was through her sensitivity and organizational prowess that groups of participants arrived each year just as the curtain went up on a production that they, themselves, would write and perform during the ensuing five weeks.

Safety, Comfort, and Focus

Everything we needed was taken care of so that all we had to do was think about our learning. (15465)

You just felt instantly at home or welcomed or expected. (13213)

Participants of the Stokely Institute spoke with unanimity when they discussed the conditions that were established for participants to have an uninterrupted immersion into learning. One participant expressed this sentiment most clearly when she said:

I think the . . . Stokely Institute is without question one of the best-administered programs that I was ever involved in. I mean it was apparent to me from the very beginning that they were really concerned with my well-being and my comfort and my safety, and I appreciated that If you needed something, you asked and it was done. (18353)

Others talked about the room preparations and the friendliness of the graduate assistants who helped during the check-in process. At least eight

of the twenty interview participants mentioned the fruit baskets that had been placed in participants' rooms. This gesture indicated that the organizers were "in tune with what people's needs are" (9472) and that this learning experience was "going to be different" (11678). When delineating how the treatment was special, one participant said:

Just the little things that L. had done for us. You know, the fruit baskets when we got there . . . she was so amenable to things we wanted to do as a group And just even the little things with the name tags being there waiting for us, and even a pad of paper and pencils being there and waiting for us, rather than saying, well, I need this and this--just having all the little things there in our rooms. I mean all our books were lined up on our book shelves--you're used to fighting the crowd at the bookstore to pick up what you need. (17473)

Other participants focused upon the freedom from "all the daily, mundane concerns" such as "taking care of laundry, the kids, paying the rent, communicating with relatives" (9796). Another discussed the "vibrancy" that she felt at the Institute as deriving from "being intellectually stimulated and being able to focus on that twenty-four hours a day instead of all the other things you do in your life (11464). She continued, reflecting:

I was sold just with the idea of being able to be on campus and not have to worry about a grade, not have to worry about

cooking lunch and dinner, and just really find out more about who I am as a learner rather than just somebody out there to get a grade.

One of the former Fellows summed up the sense of well-being that he felt upon discovering that the attention given, the materials and money provided, and the closely-coordinated events were not tied to any externally-derived expectations, but, rather, to self-organized learning goals that would be personally meaningful for each participant:

When that kind of bill is spent, you feel obligated--you want to show something for it. And when they show the kind of hospitality and courtesy to you that they did, you feel the pressure--well, I've got to learn something, and it's got to be good. And then when you find out that whatever you're learning--you tell them about it . . . and they find pleasure in it too--that's nice. (15748)

The Faculty Component

They were very approachable, very friendly. . . . I felt as though we all were pretty much on the same level. They were very nice that way--I enjoyed the rapport. . . . I felt it was very welcoming, very warm, very friendly. (16888)

They made us their equals. (12089)

One of the areas addressed by participants dealt with the sense of professionalism engendered by the Institute and its staff. Participants remarked that they felt as though they were treated as valued professionals. Contributing to this sense was an atmosphere of trust and

equality established at the outset by the staff. As one participant remarked, "nobody was above anybody else." Another admitted: "I was kind of shocked because I had thought that university professors were pretty cold and pretty aloof, but I didn't find that so" (14207). The following excerpt is indicative of this view as a participant compares the Institute to other educational experiences:

The idea that you were gathered there and that you would get out of it what you put into it. And there weren't any exams, there weren't any tests, there wasn't anything basically that said we're checking your progress, you know, if you're a professional, you do that yourself, kind of built in there. And I think it was real clear from the beginning that, hey, we're all here to really dig in this material and enjoy it and figure out what we're doing and exchange ideas. (9472)

Another stated that she felt like a "valued professional" who "... was to be part of process, as opposed to just a student who is taking a course for credit." When asked to elaborate, she stated:

The introductions, when we first assembled for actual courses, I think the arrangement of the people and everything was very--it gave you a feeling of being a part of it, socially meeting the professors. Before I went [to the Institute] I kind of wondered, well, will they ... come to class and teach and then leave. But they weren't, they were part of the group and they were with us in a more relaxed and

informal setting and I thought everyone felt valued on, you know, the same level as they were. (21635)

No announcements were made at any time during Institutes that the faculty would operate on a collegial basis. Rather, it was through the network of interactions that these relations developed and were understood:

I think that initially it was understood that this was going to be a collegial situation where everybody was going to be open and equal. I remember that from the beginning. I don't remember it being stated specifically, but I just remember that was the kind of ambiance that we had in all the meetings that we had. Nobody really lorded it over anyone else, you know, I'm not any better than you, we're just going to look at this. And that's a lot safer than saying, bang, look at this--a hit-you-over-the-head-with-it kind of thing. It was whole lot safer. (18353)

The sense of professional camaraderie among the professors and the Fellows largely delineated the rules for interactions during the Institute. Even though a single professor served as discussion leader for each seminar, "the two remaining faculty [were] present as master learners to facilitate discussion" (Stokely Program, 1988, p. 12). The continued presence of professors during others' presentations provided opportunities to enter the discussion and to "become students in the class." This also allowed for the introduction of confirmatory or dissenting perspectives,

thus producing and eliciting counterpoints or counterflows to ideas. More than one participant remarked about faculty members' sustained presence during all activities, as well as their propensity to "argue with each other" (9796):

It instantly showed me that this is something that is real for them--this is not a show. They didn't have to stay there, or they could have stayed there and been kind As far as making arguments against--they jumped right in and disagreed. (13031)

So it wasn't like this is my job and I'm going to do it and I'll see you tomorrow. It wasn't like that at all. They were able to go out to dinner with us, and we would go to the theater or go on field trips. We went fossil hunting . . . and everybody went. That made you feel as if it was a worthy endeavor. It wasn't just something they did for summer pay--it was something they felt was a good opportunity. So that was a factor in making us feel like, gee, we must be special, we must be worth something because they're participating in everything that we're doing. (13900)

When another participant was queried for specifics regarding the sense of personal worth, she spoke of the collegial interactions that included both intellectual and social elements:

. . . we got to have dinner at the Faculty Club, and even when we got there, even though we were students, we were treated more like equals. Of course, we're professionals and they're professionals. But we weren't talked down to or complained about. L. made sure we could get money to eat wherever we wanted to--I thought that was important. Instead of having to eat in the cafeteria, we could go anywhere we wanted That made me feel important, I thought. And just being picked for it. (14737)

Another participant remarked:

We felt like we could say anything to N. or J. And we felt like they were hearing us on equal terms. There was nothing forced. It was nothing that was hard for them to communicate--it was very natural. You could tell they had a courtesy for us, and they respected us, and that we had some things to say that they would find valuable. (15748)

Because grades were not a consideration, professors and the curriculum were seen as less threatening. The neutralization of the grade issue also eliminated grade competition and the accompanying potential for self-distancing or withdrawal. Another consequence of all participants receiving "A's" can be seen in some participant's renewed commitment to give an equal amount in effort to fit what each felt she had been given:

To me if someone is going to give me an 'A'--if they have that much confidence in me . . . I certainly would have busted my rear for them. (18676)

Because every participant's contribution was respected, and because perspectives were not validated by how well they matched those of the faculty, the temptation to establish a pecking order was minimized. This, in turn, left participants with the freedom and desire to learn and contribute, since respect was achieved through contribution to the dialogue and contributions could only be measured in terms of their own learning. With these relations established, collegiality could be taken seriously, and collaboration within the group could coalesce as a natural alternative to competition:

Unlike when you go to college and you are treated like a student--the teacher's here and you're here [indicating separate spaces]--therefore, you don't always say what you think. In this setting, it was more like you could say what you thought without fear of getting a low grade or, in a way, you felt like nothing was being held over you. And because of the closeness of the group, you also didn't feel threatened. And I think that's why you probably made more connections is because you didn't. (8217)

One participant contrasted the Institute with other academic settings in which "you're given a syllabus and you're told what's expected of you and what you have to learn" (15748). Even though participants

are provided a hefty syllabus, this participant did not see the Institute as a class for which "you have to learn a body of knowledge in order to meet certain requirements." He described his experience as "total academic freedom," or "learning for the hell of it;" and, as he noted, this kind of freedom was something to which many were unaccustomed:

. . . so it took awhile to get us as a group out of that mindset, that we were going to be doing something to get a grade for. And that, once we got out of that fear, and we were learning . . . no tests or anything like that, it freed us up to where if we found something that was interesting to us and wasn't on the agenda, but you flew off on a tangent and enjoyed it if you wanted to. . . . (15748)

Not everyone was immediately comfortable with the new sense of autonomy. For some of the participants, this was a new experience, and, to some degree, it contributed to a sense of confusion and inner conflict concerning what was expected of them. The collegial, ungraded forum led many of the Fellows to reflect more deeply upon their own learning purposes, since it was obvious that none of the professors was going to define that for them. When asked if the collegial atmosphere had been a new experience for him, one participant responded:

Well, not really, I had a Master's program, you know, and some classes were like that, but it was more, I've never seen it concentrated for a total program like it was. I think it made it very attractive for us. Some of the people still felt

uncomfortable, they wanted them [professors] to tell what they should learn, what they were supposed to get out of this, and what do I have to know, this body of facts, and they said, we just want you to look at these things . . . which you know is difficult to do if you are not used to doing it.
(11999)

The difficulty of adjusting to this new relational space was associated with previous educational experiences and with the perceived restrictions normally associated with teaching in elementary or secondary schools:

. . . I still have a curriculum I have to follow. And the students have certain skills they have to master in order for me to say, alright, you can leave the ninth grade and go to the tenth grade. And so we're geared for that. And you have to get out of that frame of mind before you can enjoy total academic freedom. (15748)

The Participants Component

. . . one thing I remember is when you gave a response or an opinion in the whole-group session, you were treated with respect for that. . . there were comments and statements that were basically rejected, but done so in a way that didn't totally tear you all the way down. (12305)

It was a good opportunity to learn, for sharing, for friendship, for fellowship, all of those things. (16282)

The supportive relations that were manifested in interactions among participants were responsible in part for the phase shifts that

participants often experienced from disorientation and intimidation to focus and challenge. These supportive relations also contributed to the open and collaborative spirit that most often characterized the Stokely communities. In the words of one participant,

. . . you move in on one floor with all these strangers and in two or three days it's like you're all brothers and sisters. You're sharing everything, and when that door is open and everybody feels free to walk in and you sit down and start talking about everything. And I guess what is real amazing is that in less than a week, we were pitching in, cooking, doing everything and having a great time. (19093)

Another participant spoke of an intimacy among her group that made it possible for her to share papers with other Fellows because she knew that "no one was going to rip it to shreds, that they were going to ask lots of questions, which was good--it helped to define what you were actually thinking about it" (19472). In another's words,

I guess you can't help but know the people, how close you get to the people . . . where you have to cooperatively help each other in the reading assignments and discussing the reading assignments and the evenings with them and working together with everybody. Again, you just get close and you get to know the people in your group and that's unusual. (17473)

The need for collaborative interaction that arose from the program demands was a primary topic among participants. As one participant remarked, "everybody realized they'd better get some help from some of their peers or they were going to have a miserable five weeks" (11999). The same sentiment is expressed and elaborated by other participants:

Almost from the beginning we sat out and said, how are we ever going to read all this, or what are we going to do with all this stuff, and we started interacting almost immediately. Then I knew I was going to be fine, that we weren't--so much of my education has been competitive, you know . . . and it became apparent, real clear, to me very early that was not what this was about at all. And then I began to think this was going to be the greatest thing, the greatest experience, that I really was going to learn a lot, which is different from a lot of my educational experiences. So I remember early on forming bonds with people and feeling very safe then, non-threatened by what we were going to do intellectually, although some of it was going to be over my head. (11464)

The residential aspect of the Institute assuredly contributed to how mutual participant support developed. For one participant, "it was more of an enrichment from the people" (18676). For another, the Institute became

. . . a very total experience. By living there with the people that you were with--you were in constant conversation about what was going on. It was real intense . . . living with the people you were doing things with and getting together in study groups and working. And it was a total experience that way as well as from the fact that all of us were professionals in the teaching field. (8217)

The intellectual sharing that characterized these groups provided a bridge for the introduction of professional and personal concerns that contributed to new friendships and supportive interactions within the group:

There was that patience and openness to listen, to explore and to share personal experiences and to share professional experiences as to how they might have dealt with the same questions, but not ever like this is the way you should do it . . . they might say if I was in that situation, or give you some books that they had read in the same area or on the same question. I think everybody pretty quickly realized that we were establishing personal meaning in a lot of different dimensions. (19472)

That interaction--even though it might seem common and mundane, well, so what. We all got together and talked about things [professional concerns], but because that doesn't happen in the usual teaching situation, that's what made the

Stokely Institute interaction so special and so invaluable-- that you had time to sit there and discuss it and help each other and talk about the stuff that you had done (17894).

For some participants, the personal dialogues and opportunities for sharing were the most figural aspects of the Institute. As one participant remarked,

I think I learned more from what we did as a group together--those kinds of things, the relationships, but that's the kind of person I am-- what I had learned being with the group (18676).

CHALLENGING

Everyone who came there came from a different need, probably not sure of what they were going to find there, not sure what they wanted to find there. (16446)

Stokely takes more of a commitment on a teacher's part and a willingness to really stick with it and work at it. (17473)

Maturana (1980) identifies the coalescence of community when “ . . . certain contingencies are given that force them [people] to survive by integrating through their behavior a network of interactions that becomes a medium for the realization of their individual autopoiesis” (p. 12). This characterization aptly describes the organizational relations that were in place as participants began to realize the “Stokely experience.” It may seem paradoxical to talk of forced contingencies when referring to self-organized communities, but continued existence of such

communities depends upon the adaptive capacities of the components that constitute them. This is not to suggest that the direction of change, or learning, was determined on a measure of optimal fitness to the challenging nature of the Institute; for those changes and phase shifts were "completely underdetermined by the constraints of survival" (Varela, Thompson, & Rosch, 1991, p. 196). What is essential to understand about the "challenging" aspect of the "experience" is that the challenge helped establish the relational space that necessitated a level of interactions that enabled learning and growth in all of its omni-directional variations.

The Program Component

. . . it was to provide I guess a different atmosphere than we were used to and one that would challenge us, and I think it did. I know it challenged me, and while I was going through the program, it was, I wasn't really a teacher--it was I was a student here. (16983)

I saw the readings and I thought, oh, holy shit. (11464)

A corollary to those supportive relations that allowed for the comfort and safety of the participants is the aspect of challenge that all participants identified as a primary characteristic of the Stokely Program. In many cases, it was the establishment of comfort and safety through support that allowed participants to quickly transform their initial sense of intimidation or threat to one of challenge. For most participants this transition occurred during the first week.

All participants felt challenged by the amount of readings (over three thousand pages of text), the complexity of ideas within the readings, and the subsequent seminars. One participant summed up her response to this new challenge when she said

. . . before the Institute, I loved to read, it didn't make me want to read more, it made me less threatened by challenging reading material At one time I would have said that's over my head--it made me much more likely to break something down and analyze rather than just dismiss it as I don't even need to think about that. And that was good for me to realize. (11164)

For many of the participants, the challenge itself was a recognition of their own potential to contribute, and the high expectations indicated a belief in their own capacities to operate within the collegial learning environment that the participants, themselves, helped form. This sense of recognition through challenge was communicated by one participant as she talked about how she would describe the Institute:

I'd tell you that it was a great learning experience, that it's a lot of work and a lot of reading--and things you might have never read before and that are very interesting. I look at it as kind of a gift to teachers--a gift to teachers because they treat you like you're important And the way you get treated all year, you know, that's sort of a shock. (14737)

Another participant put the challenge of the program in more blunt terms:

It was Marine Corps boot camp, you know, break you down to build you up. I think sure it was intentional--you have to

do this, so you had better learn to do this, so most people who had any sense caught on to it. The idea was to form a community, a learning community, and we did, I think. (11999)

For some participants, becoming a part of an intellectually-challenging learning community had its own rewards that began during the Institute. In discussing the positive feeling that came from acknowledging the challenge, a participant remarked:

I felt just real comfortable with my understanding of what we were doing in the classes at the Institute, and I knew it was really demanding, so I thought, gee, I'm smart enough to do this and this is hard and I'm doing really well. (15465)

The extent to which participants shifted to a collaborative mode affected the degree of success in meeting the challenge that each Fellow defined for himself. For one participant who never made the collaborative shift, the challenge was translated as stress and pressure that were outwardly and inwardly imposed:

I came home one weekend, but when I came home--it's like a three-and-a-half hour drive--I stayed home less than twenty-four hours. I wasn't comfortable being here. I had to get back and I had things to do. There was this little push. There was an astronomical amount of pressure. I'm not sure if they did put it on us, but I put a lot on myself. (18676)

One participant who was initially intimidated by the amount of reading wondered aloud during the interview if his own transformative experiences could have occurred if it had not been for the challenging aspect of the program:

If it's intimidating up front and you survive it, you have that whole sense of accomplishment, so maybe it needs to be just as intimidating as it is . . . and they'll feel a sense of accomplishment relative to what they put into it. (11678)

Another of the participants made a clear distinction between threat, which she associated with stress, and challenge:

I didn't feel threatened at all by any of the experiences that I had there. In fact, I was challenged by what went on. I think the amount of work that we had to do was enough, and yet not so much that I was, I never felt stressed with the amount of work. I enjoyed the camaraderie there that we experienced, with the professors and with each other and that type of thing. That was good. Interrelationships with new people and studies that I had never really done before--that were interesting, intriguing to me, that I was able to contribute to and yet not feel stressed by. And nothing was demanded of me that I didn't--I knew that I could do what I had to do And it was a good feeling and I was not required to do anything that I did not want to do. (16282)

The Faculty Component

You may not see a connection to what he's talking about until never--he just makes you think, as opposed to giving you any kind of answer. (15748)

For some participants a sense of inadequacy produced anxiety and intimidation during the first hours and days of the Institute. For most this perception of an outward threat soon became transformed to an inner challenge as expectations by faculty members came to be understood in terms of shared dialogue rather than an expertise in an academic specialty:

So just realizing that I don't have to be threatened by something that I might think is intimidating, not to be intimidated by any particular subject. I think of the three [professors] he was--I would have been most intimidated by him from the beginning and who I ended up being most impressed by. I felt he really changed my attitude about being open to different areas. (11464)

The permeating atmosphere of collegiality and equality contributed to the participants' sense of professionalism, and that, in turn, contributed to conditions whereby participants felt safe enough to open themselves to the challenges of new perspectives and the expectations that each participant could contribute through her own active engagement:

I think probably the thing I will always keep with me about Stokely is that sense of collegiality that--it was just challenging intellectually. It wasn't milktoast stuff--it was good stuff. It was quality and, yet, there was that respect for my own sense of intelligence. (18018)

Those who acclimated early to the collegial setting experienced a phase shift from a sense of intimidation to one of challenge and anticipated accomplishment. When asked at what point the "enormous" amount of reading became less intimidating, one participant remarked:

I think once you got that first-name basis, and the risk wasn't so, you know, you go to class and you could give an answer that didn't have to be the right answer, it could be, you know, and I think that's when the stack really went down. (11678)

In referring to a Stokely professor's emphasis on the challenge of personal inquiry, one participant said, "His whole point was that there's so many questions out there that there are no answers to, and he made us look at ourselves. . . I guess he just made you look at your soul" (19093). Another participant provided an insightful summation on how the Stokely professors of history, science, and philosophy provided time-oriented challenges as they moved between the roles of discussion leader and student:

[The historian] challenged me to think about the past, [the scientist] challenged me to think about the future, and [the philosopher] just was, from day to day, deal with today, deal with how you're thinking today. . . I think that they were three individuals that challenged each other's thinking, but knew how to do that in a very supportive way, and constantly were reflecting on their own thinking when they challenging someone else. (19472)

The Participant Component

I just really enjoyed the challenge of something new. (17473)

A number of participants brought with them to the Institute a distinct thirst for intellectual challenge. One participant used that analogy to describe her own professional work environment that she experienced as intellectually barren:

. . . is there anybody out there who will talk about ideas open-mindedly, will experiment with methodology, will experiment with philosophy, will experiment period with anything, because the professional environment that I was in, there were probably really two other people in the system that I felt comfortable, as open as I was in Stokely. (19472)

Whether participants came to the Institute experiencing conflict or whether conflict developed in conjunction with their own explorations, the need for conflict was spoken about by the participants:

I think it's a thing where there has to be a bit of dissatisfaction with what's going on. Because if you're, first of all, if you're totally satisfied with what you're doing and how it's going and everything, I don't think you would be willing to put the effort it takes to go through the Institute because there is definitely an effort required. (8217)

In discussing change, one participant said:

And it's not always comfortable, but it's part of life, and sometimes you just have to take that leap and jump off the cliff and what comes, comes. I don't know any other way to live--the way I was raised I guess. And I can't really relate to people who don't live that way I was going through transition anyway--I'm happy where I ended up. (18353)

The same participant, who had recently begun to inquire into her own religious beliefs, commented:

. . . it was exciting for me to be able to see other people go through that process--kind of you know, whoa, what do I do with this--never had to confront this part of my belief system. And I think that was intentional and I think it was good. I mean immediately people knew they weren't going to be in a rut, in the same safe place. It might have been uncomfortable for some people. They weren't in a safe place,

you know, they were going to be pulled out of that place where they had lived and pulled into some place where they had to explore new territory. And that's risky and that's scary. (18353)

One participant described the personal characteristics that would limit growth as "people who are afraid to look at themselves and challenge what they've been taught and come to a different conclusion about the way they should be teaching or the way they should process what they know and think" (13900). Several participants spoke of members in their groups "who were so set in their thinking that they were unable to look at anything from a different perspective" (21281). All of the participants interviewed saw the ability to accept and initiate challenge as an important characteristic for Stokely Fellows, but more importantly, they recognized the potential harm to children that accrues from the absence of this characteristic in their teacher:

If you are inflexible in the way you think and look as adults, how must you treat children who are different from what you think children should be, or how do you treat the thinking of your students who are the least bit different from your own thinking I'm not sure there's as many right answers as teachers think there are, and there are lots of different ways to look at things--and these are people who just can't look at things but one was--that really bothers me. (21281)

While the intensity, breadth, and pacing of the program provided intellectual challenges to all of the participants, the interrelated subject matters proved equally challenging to many closely-held belief systems, both religious and philosophical. It is important here to point out that the transition to challenge and openness appears to depend partially upon the state of readiness of the participant and her willingness and ability to interact:

. . . when we first went in to that class on Monday morning and C. opened up this thing with the Bible and philosophy and challenging beliefs, I thought right-on, this is great . . . that really fit with where I was personally in my life. So I was excited the first day. I was just excited, that's just where I was. I remember going home that night and a lot of folks were not sure about how they felt about this because it was challenging beliefs--how do I deal with this? (18353)

One participant expressed her belief that "even the quietest in the group had to have their thinking challenged, and whether or not change came about for them privately or sub-consciously or after they got home with a relative, it had to happen" (19472). Formulating and expressing these challenges and changes was often as difficult as it was common among the participants:

There were a lot of people who seemed to me were having personal, deep personal, emotional experiences with something in their lives that maybe they had never had

before. I don't know, a catharsis, I don't know what it was, I can't tell you. And it may not be unique with us, but it was certainly unique with me. It was life-changing for me in that I took the next year of school out. (13031)

Each Fellow recognized and refined his own unique challenge as the Institute proceeded. As participants explored the perimeters of their own limitations, expectations were as high as they were unspecified; and in a very real sense, challenge from without became challenge from within. As one participant said, the Institute was "an opportunity to explore disciplines you may or may not have prior knowledge of, but that you would learn hopefully, discovering yourself in other ways" (13900).

OPENING

. . . if my ideas are worth something, you know, I feel good about myself and much more likely to say, okay, I'll open my window a little bit more.
(9796)

"Opening" was the most talked-about aspect of the Stokely Institutes. Former Fellows used "open" to refer to the preferred latitude of the relational spaces within which they were engaged, and they used "open" to refer to a willingness among participants and faculty to actively and receptively interact in such a way that openness could be fostered and maintained. Open interactions were seen as essential for renewal and growth.

The Program Component

It was an opening up of ideas as opposed to filling you with ideas (21195).

While highly structured with a rigorous set of readings and seminars, the Institute provided latitude for participants to explore a variety of data from which they generated in-formation. Participants talked freely about the relations established through the network of interactions that enabled self-organization of individuals within diverse groups. These interactions, best characterized as collaborative exchanges were, indeed, necessary for growth and renewal among the individual participants. The active nature of this in-formational process is emphasized by the following comments:

For me the Institute said, you are a learner--you can do whatever you want to do as far as being a learner. Whatever direction you want to take, you don't have to be content with just accepting information from other people. You can look at this and, essentially, make your own knowledge and it has value. It's not just a passive thing. (12305)

The growth and renewal experiences of Stokely Fellows led one visiting professor to ask: "What is it about reading Plato that leads these people to a life-changing experience?" This question, asked rhetorically perhaps, leads one to question further if reading Plato, in fact, has anything to do with the life-changing experiences of former Fellows. For the Stokely curriculum, as did the faculty and Fellows, varied from year to year. Yet these variations did not seem to influence the propensity for

transformative learning among participants. We may conclude, then, that it was not the nature of the structural components that was responsible for changes that the Fellows experienced, but rather, it was the nature of the interactions that were constituted by the structural components within the relations that those interactions produced. These interactions were sustained by the open, in-formational exchanges that occurred throughout the Institute.

As surely as many of the participants made intellectual connections regarding the overlapping of science, art, history, and philosophy, just as many developed a new understanding and appreciation for open, self-organized inquiry. This freedom to interact with ideas and with others who are defining their own forms of self-organized inquiry contributed largely to the memorable experiences that the participants recalled:

. . . freedom comes to mind It was a very liberating time in my life for me to be able to pursue the things that I really enjoy pursuing. It was just an extremely joyful time in my life because I love to delve into ideas and study and read, and was real exciting for me . . . freedom from my family and the responsibilities of the family, motherhood and household--whatever that is--and freedom of my time. . . freedom of ideas, it was very, I felt it was an opening of ideas as opposed to filling you with ideas. . . it was freeing for me in that it gave me an opportunity to meet other adult people and to have time to spend with other adult people, which was something that I don't take time for. (21195)

The Faculty Component

. . . whatever we wanted to find out, he was just real open to whatever we wanted to know and to do and to try. (14207)

In a way they're leaving themselves open in a way they don't have to in the classroom. (10299)

Openness was an attribute that permeated the Institute and the descriptions of experiences by former Fellows. While the program offered a rigorous set of readings and full schedule of lectures, seminars, and events, all of it was carried on within a relaxed, collaborative environment that was maintained by a staff who worked to maintain an open exchange of ideas. As one participant remarked, "I felt very comfortable asking them any question. Or expressing how I felt" (19472). Another remarked:

They were very, very open to any part of the learning process, or anytime anybody wanted to jump in, and go to a different place, they were very comfortable with that. The other professors stayed for the sessions of their colleagues, so everyone knew what had been discussed. Everyone knew what had transpired--then, they became students in the class. (13900)

The openness that the professors established allowed many, otherwise reticent, participants to interact more freely and to establish their own sense of openness among people and their ideas. A participant who formed a close tie with a history professor spoke to this notion of the risk and rewards of openness:

She [history professor] said she almost felt like she was laying herself open, which she said she hadn't done in a long time.

In a way there is a certain risk involved. And either you enjoy it or it's a very scary situation, I think. Most of the time it's like everybody else, once they got used to opening, it was okay. Nobody was going to get you. (10299)

Other participants characterized the openness of the Stokely faculty in various ways. The departure from the "straight lecture group" was noted, and participants "always felt like we were free to ask questions, free to contribute if we had something to contribute" (17473). One aspect of openness had to do with an openness to disagreement in which criticism was offered and openly received. One participant said, "I love other ideas, and it was so nice to see and hear the professors agree and disagree. And they could do it easily, and it didn't cause any friction in their friendship. And that was a good lesson to my roommate and me" (14207). Another participant found one faculty member in particular "always open and really laid back about most stuff . . . I had no hesitation whatsoever about saying, hey, you're wrong, you're dead wrong--that kind of thing" (12708). Another participant said of the faculty, "they just kind of opened it up and said, well, the ball's in everybody's court here and we're just going to exchange ideas and you can enter whenever you feel like throwing your two-cents worth in" (9472). This kind of open forum for informational exchanges remained crucial in the subsequent transitions and transformations that participants experienced.

The Participants Component

I think the only limiting factor would be open-mindedness . . . willingness to accept other people's idiosyncracies and values, and not lose your shirt if somebody says something you don't agree with. (9796)

I guess the main thing is just to be somebody that's open, and it doesn't have to be wide open--if there is just a crack there. (12305)

The degree to which participants were open among their peers to the free exchanges of ideas varied. As one participant said, "Of course, everyone was not equally open-minded. But there was enough so that it was contagious" (19472). What is clear is that the degree of openness was related to the extent that the participants viewed themselves as being treated as valued professionals within a safe, diversion-free environment from which they were free to explore personal meanings related to novel concepts and ideas. The early validation of the participants' contributions and potential contributions to the seminars and study groups tended to minimize defensive tendencies that would "keep you to your inner vision" (9796). At the same time, the participants felt that their ideas were of value, thus leading one participant to conclude, "my ideas are worth something, you know, I feel good about myself, and you're much more likely to say, okay, I'll open my window a little bit more" (9796).

Former Fellows voiced varying opinions on the degree of openness necessary for learning to occur. One participant noted that

the trouble with open-mindedness is that your brains can fall out. You can *so* open-minded and accept everything at face value, just say that's right, at some point in time, you have to make some, I'll accept this and I can leave this, this

may be true, but I still don't believe this or that. But I don't think it soils you just to find out about it. (13213)

Another saw a greater degree of openness as necessary in order to fully benefit from the experience:

You've got to be willing to be open. You can't be, you've got to go in to ask questions. You've got to be willing to almost bare your soul, to share, or you won't learn or grow if you're not going to do that We were just not there to grow intellectually--I think we were there to grow spiritually, emotionally, and if you're not going to participate, then it's not going to happen. (19093)

The following excerpt represents a view on openness that falls somewhere between the previous two:

. . . whether you were conservative, moderate, liberal, [if] you were open to other perspectives and you wouldn't mind entering into verbal interaction, it would be something you would enjoy. . . if your mind is set on one particular viewpoint, and you're at the Institute, you're not going to learn unless what happens reinforces your particular viewpoint and gives you new ammunition, because you're going to be so closed to whatever happens, you only hear whatever you want to lock into . . . you need to be open to all possibilities and at least entertain them, and even if your

mind is made up, you need to understand that there are other viewpoints. (15748)

Several participants spoke of the opening up that coincided with the disappearance of threat and intimidation that some felt initially:

. . . my roommate was much more serious than I was. And she was much more intense about getting through all of this material, and by that point, as every day went by, I was becoming less serious, less threatened and more just like a sponge I became much more open to all of it when I became much less serious. (11464)

Within the large group of Stokely Fellows that usually numbered around twenty, smaller groups coalesced, faded away, and reformed, sometimes with different participants. One participant remarked that she saw the Institute as “a fluid experience,” one that offered her the opportunity to be among different people at different times (16446). As noted at the beginning of this chapter, free and open inquiry became self-sustaining once the relations for free and open inquiry were established as a result of the network of interactions.

Openness among groups varied from year to year. In groups whose members attempted to restrict the types of interactions by limiting discussion of topics that appeared to conflict with certain values, group cohesiveness and individual openness became threatened. As one participant said, “there were some that were open to ideas, and some that

were closed to ideas that were different from their own . . . and that made it kind of hard I think" (14207).

Attempts to restrict openness were dealt with in a number of ways:

It did not provide an atmosphere of freedom to express yourself because you knew these people were sitting over here talking behind the back of the professor I felt that once I realized that it was a rather closed environment, it kind of caused me to be more careful about what I talked about and to whom. (21281)

Another participant from the same Institute took a more active stance in maintaining open inquiry:

You don't let it start affecting the way the group operates. . . because he [one of the participants] would openly say, we need to get off this--we don't need to talk about this anymore. Well, what effect that had on the teachers was like pouring cold water. Somebody finally got to him a couple of times and said, ease off, back off, we're not against you, all that kind of stuff. If you can't deal with it, just don't say anything at all. And he was fairly nice about it. But it did put a damper on the freedom you felt like you had. And it almost made him not a part of the group for awhile. (13213)

The prevailing view among the participants was that the distinctiveness of viewpoints was to be respected and that such

complementarities provided a diversity that informed the seminars and informal discussions:

I know she [program director] was awfully upset with us at the beginning because she wanted the doors open. And we wouldn't open them. And when we finally got used to that, then it was just like a big family. And having everybody come in to your rooms, and the discussions and the arguments and here you had ultra-conservatives, very traditional, and you have these other people who are way out in left field, but they helped explain some things to me.
(19093)

INTEGRATING

I'm not sure that anyone can integrate knowledge for you. That's a skill I think that we develop from learning and from doing (16446).

. . . every part was meaningful and every part fit a whole (19472).

A crucial element of the relational space that helped define the Stokely Institute was the integrative boundaries within which emergent patterning and new connections were derived by participants. In the sense that the Institute served as integrator of the intellectual and the emotional, one may see Stokely as a harmonizer of spirit; for it was within these communities that many ideas became suffused with personal meaning and many values came under the bright light of intelligent scrutiny and reflection.

Since the merit of the Institute was always measured in terms of the autopoiesis of its individual constituents, the term "integrating" is not used here in any sense of smudging distinctions and differences. After all, it is the realization of distinctions that makes integration possible. "Integration," then, is used here to point to the imbrication of ideas and the overlapping of viewpoints that characterized the relational space that came about through the network of interactions among participants, faculty, and texts.

The Program Component

. . . and coming up with this idea of balance, that this all had to balance in together, and that was like another revelation to me, and that was like a synthesis, you know, all of this--the art, the science, the right brain, the left brain--it just all came together on this mind map of this balance. . .
(11678)

The Stokely Program was designed to accommodate multiple perspectives from various disciplines. In talking about other educational experiences, both during and since college, participants referred to the lack of interactions and connections that accompanies the isolation of disciplines:

There was not that chance [in college] for overlapping that creates the insights as to how everything fits together so that you know who you are and where you are and what you're doing. (19472)

Another related this isolation to her teaching position:

We're so departmentalized and compartmentalized--the English department meets here and does this. No one knows what we do, and we don't know what anybody else does. . . . And I don't think that's right. (13900)

In contrast, participants spoke of the Institute as an attempt to integrate and to develop understandings regarding the interrelatedness of knowing. One remarked that "we could easily have studied three independent courses and not gotten such a different picture of the whole thing" (17473). They spoke of a need for themselves and their students to develop some notion of the theoretical and historical foundations of ideas, and to see how those ideas evolved over time. For some, this search for connections was a new experience, and for others it served to focus and provide a path for what had previously been an intuitive longing for an understanding of "the big picture." For many, this new appropriation of meaning through learning about learning had an empowering effect that repeatedly extended beyond the scope of any single scholarly pursuit. These ideas are clearly represented in the following excerpts as participants talk about the integrative aspects of the Institute:

. . . it gives you the integrated perspective of what's going on. And once I had that framework, coming from natural sciences, political sciences, and, essentially, psychology, in the field of education I began to see how things in education were spin-offs from philosophies in these areas. I think the Institute does a lot to empower its participants to go on and do whatever they want to do. . . I'm not sure they intended it

to fit as well as it did, and the meanings I took away from it might not be what somebody else took away from it. But from that, and seeing how all those things were interrelated and then coming back from my perspective as a teacher and seeing how educational philosophy was a spin-off to some degree from that evolution, that really made me want to look closer at the whole picture. (12305)

The proximity and interweaving of ideas from the humanities, sciences, and the social sciences provided an essential source for interactions among the participants. And while the actively-related instruction in which “one professor would pick up the thread where the other left off” (17473) provided impetus and clues regarding the connectedness of seemingly disparate disciplines, it was the search within and among individuals that fostered the insights that signaled transitional states to new levels of understanding. As one participant said, “the vibrancy was ours” (11678).

The reexamination of learning through personal involvement and the integration of perspectives through active dialogue and reflection were essential elements of the Stokely experience. Participants remarked on “the need to sit back and see where it goes together” (8217):

. . .we weren't just being lectured to--we weren't just soaking in all of that information--we were also participating and we were examining ourselves and some of the things that we were learning, and we were comparing those and learning from other learnings and putting those all together, so it was

kind of like an integration, I guess, of what we were learning and what we were reading. (16282)

The intermingling of ideas and concepts that is characteristic of the Stokely curriculum encouraged intellectual interactions. In turn, the free exchange of ideas helped shape conditions for interpersonal interactions. This integrative aspect of the program set the stage for the emergence of each participant's own sense of meaning, a development that remained contingent upon the continued actions of the participants exploring their own intellectual and personal boundaries:

. . . we were trying to look at one thing from different ways and work that knowledge into an integration of what we were learning, but I'm not sure that anyone can integrate knowledge for you. That's a skill I think that we develop from learning and from doing. . . . what do you do with what you know--that, to me, is what integration of knowledge is--taking everything that you experience through all of the senses and then, not only the product but the working through, of making sense of what you know, and ending up with not just a product but more than a product. (16446)

The Faculty Component

About the second week I think we became a community. (11999)

While the focus of the Institute was upon an interdisciplinary inquiry, participants found value in the wide range of specialties and

styles that the professors brought to the seminars. This diversity of style and viewpoint provided multiple sources for connections across disciplines:

. . . the people who were presenting it were diverse. It wasn't like they were all from the same discipline, so just by being from different disciplines, they had a different approach to things. Some of them were more talkative than others, and in a way, through the three people they represented a lot of the approaches used by the other people [Fellows]. So if you didn't feel comfortable with one way of getting it, you would get it from someone else. (8217)

Through their open interactions, the Stokely faculty demonstrated how diverse perspectives may inform thorny issues in such a way that new perspectives could emerge unmarked by the perspectival limitations imposed by a single disciplinary focus. Integration among the faculty of the Institute was both planned and serendipitous. There was substantial planning among the staff to offer readings, discussions, lectures, and activities that would appeal to many disciplinary areas and that would instantiate the interrelatedness of ideas across fields. As one participant commented, "the way that they did the interdisciplinary approach, every part was meaningful and every part fit a whole . . . they were modeling this ideas of interdisciplinary learning, interdisciplinary teaching" (19472). This same participant saw the integrative approach as a significant factor in the emergence of meaning, and she contrasted the Institute to more traditional liberal arts teaching:

. . . it was probably not presented in the integrated whole that Stokely is. You know, they took this philosophy class, they took this English class, they took this history class, but there was never the chance to have all three of those professors and classroom experiences at the same time. There was not the chance for overlapping that creates the insights as to how everything fits together so that you know who you are and where you are and what you're doing. (19472)

The Participants Component

I was a little bit afraid that I would be, you know, kind of below them [the other participants] academically, but we all fit in together (14207).

We all realized immediately that we couldn't do it alone . . . we would have to do parts of it and then kind of come together and collaborate on it (18018).

One of the primary manifestations of openness among participants was the presence of collaborative and cooperative efforts in bringing coherence to the wide range of ideas. As indicated in earlier sections, the concentrated curriculum and the latitude for interaction helped establish the relations necessary for a transition to collaborative learning. All interview participants took part in study groups of varying configuration and consistency. Some met regularly at a central location as a large group, where they "spent a good two hours summarizing and discussing the reading material as a group" (17473). Others formed spontaneously as the need arose, and one participant noted the presence of "small groups within the group" (11464). The responsibility given to each participant to contribute to the seminars and to generate response papers increased the need to approach the daunting amount of daily reading through

some kind of collaborative effort. These informal study groups, in turn, would contribute to the conditions for the emergence of learning communities.

For some participants, these study groups began to coalesce almost immediately. For others, formation took as long as two weeks. In all cases, these collaborative groups were self-organized and characterized by varying degrees of spontaneity:

We would have a project and you'd go down the hall and at the end of the hall there would be a few people working on it, and before long, there would be ten or fifteen people working on a project together. Or everybody would say we're going to order out Chinese tonight--if you want to work with us, come on down So a lot of the projects that we had to do were just sort of spontaneously--we all just kind of came together . . . it seems like everybody just kind of fell into it together from the beginning. And I don't remember it being explained that we could or couldn't do it this way. It was just, that's the way it happened, spontaneous. (18018)

Some participants saw the collaborative work outside the seminars as the most meaningful part of the learning experience during the Institute:

. . . when we went back to the dorm and talked about it and thought about it and kicked around ideas--that was the real meaningful part. . . you know, the way we kind of got our

study groups and taught each other, I mean that's where the meaningful learning was. B. and G. and C. [professors] were just these remarkable catalysts for us all, I felt like. But the actual, they were vibrant, but the vibrancy was ours, but they had to somehow transmit that and they were able to do that. (11678)

You had this sense of community. And that was partly because you were all isolated and you were all living right there together, plus you had to help each other out to cover that material. You had to divide--you had to teach each other, so that's peer learning . . . teachers involved in learning as well as teaching, the teachers [professors] as facilitators. (15465)

The Institute was an immersion in the whole process of learning. What we did in our lectures, whatever we called them, that was just a real part of it. What we did then, when we went back to the dorm and talked about it and thought about it and kicked around ideas, that was the real meaningful part. And that doesn't happen if you go in and out. You know, the way we got our study groups and taught each other. I mean that's where the meaningful learning was. (11678)

Not only did these study sessions allow for collaborative exchanges related to the Stokely curriculum, but they also opened up opportunities

to explore novel notions and ideas that were tangential to the planned curriculum. As one participant stated, "I don't recall anyone so totally opposed to anything we did, and I remember some pretty radical things as far as--we would just go far out, far afield of what anybody was accustomed to doing" (14737).

The degree to which the workload became a figural aspect of the experience appears directly related to the capacity for collaboration of individuals who comprised the group. One participant brings this to light as she contrasts her own experience to that of a friend who was a Fellow during a different summer:

Her experience wasn't nearly as positive. She saw it, she had a good time, and she would do it again, but she saw it much more in terms of how much work it was and much less in terms of the people because she said her group never bonded like ours did. . . so naturally, her experience would be very different than mine and my experience is colored by the unique people that were there the year we were there.
(11464)

Another participant, who realized early on that she would be unable to keep up with the reading assignments, remained disinclined to shared responsibility. As a result of her reticence to engage the collaborative efforts of her group, the focus of the Institute became the gap between the assigned readings and the degree of her own completion of them:

I guess my big problem was the amount of work that was given to us, and I had trouble just coping with that. I had trouble coping with it because I didn't feel comfortable sharing the load. And I couldn't possibly do all of it myself. And that was my big problem with the Institute. (16282)

More than one participant spoke with wastefulness or sadness about the end of the Institute. For most, the final day was emotionally charged; and for some, it brought a realization of the singularity of this opportunity to be a part of an integrative learning community:

The end time was good when we shared, when we realized this is the last day, this is the last day. We're not going to be able to do this, you know, a month from now, a year from now, or five years from now. When we meet each other it's not going to be the same. It's just, hey, remember we had a great time and that's the end of that. It's not going to be this intense, it's not going to be this real, it's not going to be right later on. We have to be, or at least I felt I had to be, truthful, to give as much as I could. (13031)

It was very sad, you know, I wanted to continue the relationships. I held back a lot, I think, because I'm that kind of person. Then all of a sudden I wished I had shared more of myself. I wish I had gotten to know people better. I wish I had been involved with people more than I was. See, I was involved with the ideas and all that stuff, and I love that, but

probably there were growth experiences for me with the people there that I didn't have. . . .(21635)

EMERGENT MEANINGS

I think every teacher knows in their core that . . . a teacher is a facilitator of meaning. And somehow in all the bureaucracy and political demands and bureaucratic stuff, sometimes you sort of lose your path of meaning, personally as well as professionally. So I think that is what Stokely does, it reestablishes a path, not necessarily the same one you were on, but as you leave you have a really good solid feeling--or I had a really good solid feeling--of where my path was. (19472)

If, as Lonergan (1958) maintained, meaning can be related to the "intention of being" (p. 358), we may see the emergence of meanings for the Stokely Fellows as understanding is projected upon a path of action that understanding has cleared. Thus, meaning is enacted and embodied in the interpretations and actions that are brought about through understanding that begins with insight. It becomes clear, then, that meanings related to the Institute emerged during and after the Institute, since it was through the unfolding of the path begun at Stokely that subsequent experiences became enfolded within understandings that grew out of the Fellows' participation during that five weeks.

As mentioned at the beginning of this chapter, the coming together of the participants, program, and faculty formed the fields of coherence from which emergent meanings were produced. The meanings that emerged from these fields were both synoptic and instrumental in nature. The remainder of this section will link statements by participants to what these meanings were.

Instrumental Meanings Related to Profession

It opened a lot of doors for me. It gave me some more choices, some more options. (12089)

Since their participation in the Institute, a significant number of former Fellows have modified their own roles within the field of education. Of the twenty interviewed for this study, five have begun and/or completed doctoral degrees. One has become a curriculum specialist for a magnet school. Another participant who teaches history and coaches football started an interdisciplinary team-teaching project the year after his Stokely experience. In referring to the power of collaboration he discovered at the Institute, he said, "I feel more comfortable doing it after being through the Institute, you know, team teaching." Subsequently, his team member has been to the Institute, and they continue to teach a course that focuses on linking world history and world literature.

A significant aspect of professional development came to some participants as a recognition of their power to affect their own practice. In this respect, participants came to see their roles as more proactive in addressing problems and shortcomings associated with their own teaching. One participant, who saw his own practice as moving from control to facilitation, talked of how this change came about:

I don't bring stuff home as much. I've cut back my workload as far as taking it home. Which means I've cut back my workload for assignments for kids. I've re-adjusted it--I don't grade everything now. I used to grade every piece of paper that came in--if you turned it in, it was graded and returned

as quickly as possible. I mean, I felt like that was my obligation. I had a big "T" here [indicates chest], Teacher. You do the work, I'll check the work So it has caused me to change some. But the first change didn't deal with technique. And that's what I had been doing in the past--you go to these classes, they teach you this technique, you come back, you apply the technique. The thing that happened to me two years ago [Stokely] is that *I* changed. Then as a result of change, I said okay, if I want that accomplished, I've got to do some other things. So I started looking for it, and the techniques are there. I just saw a light. And I'm starting to take care of myself better. I've got a healthier attitude toward kids. (13213)

Another participant who was moving toward a supervisory role concentrated upon the possibility for helping teachers make the connections that lead to more integrative learning:

In working with teachers, which is what I'm moving into, there's a lot more that would like to be able to do things if it did not take so much work to just connect it. In other words, take what you have in the books and put it together--if they had someone who would sit down and help them go through it to put it together, they'd feel a lot more at ease. Or see someone else do it. (10299)

One participant described his experience in terms of the professional renewal that he felt upon leaving:

. . . for me as a teacher, it was a renaissance, kind of get my mind back where I wanted to be. It gave me, got the old gas tank filled up again, you know, you get in a kind of rut, here you are in that damn classroom, the door is always closed . . . You're so departmentalized and if you're coaching, as soon as the bell rings, you're going out to the field. . . so it really gave me an opportunity to meet with peers and share some ideas, kind of like an in-service that really means something.
(11999)

Empathy

. . . it always was helpful to me to put myself in my student's position one more time, just as a reminder of what it's like on the other side of the desk.
(18018)

It was a bigger experience than being a teacher. As a teacher I regained the experience of being a student. (10743)

To know about learning is to become a learner. Assuming the role of active learners enabled Stokely participants to understand once more the relationship between teaching and learning. As they re-entered their teaching positions and as they reflected upon their Stokely experiences, participants became more attuned to the needs and potential contributions of students. As participants explained:

. . . you're in the learning stage, not in the teaching mode.
And that's important, it gives you, you're more receptive to

your students, you understand what's boring and what's exciting and I think that teachers need to periodically go through that. . . if every six months you would go into a situation where you were learning and not teaching, then you would know how it felt--it might make your classroom fresher. (13900)

I realize that I was always in awe of professors, that I thought that they were--maybe that's the way the kids see us . . . it [Stokely] made me realize that I'm not as smart as I think I am with my students, and that they're not as dumb as I think they are. And also the fact that we teachers have as much to offer as any college professor. And as far as the kids, I realize they have a lot to say. I have been a little more understanding of some of their problems and their abilities. And I think that's one thing the professors did--they made us their equals . . . They accepted the fact that they didn't have all the answers, and we knew some that they didn't know. And they also let us teach them. (12089)

The open dialogue of the Institute also served to remind participants that the marketplace of ideas is better understood as a venue for the complementarities of perspectives that we distinguish through their similarities and differences to our notions as observers:

And I can remember at times thinking, you know, that somebody would say something and it would be, I would find

myself thinking, well, I didn't see that at all. It's sort of nice to be able to see that because as a teacher we forget that there are some other perspectives than our own And it was nice, too, to be able to have someone see something and you go, oh, yeah, I know exactly what you're thinking or what you're saying because I have been there at some time or another and thought the thoughts that you are expressing now. (16446)

New Strategies

I think that's what I try to do in my classroom now--to form a learning community. (11999)

I think I am more conscious of trying to help them connect why these things go together. (8217)

Most of the participants mentioned a new teaching strategy or tactic that they could directly attribute to their experiences at the Institute. Generally, these new approaches were toward integrating curriculum, collaborative activities, more openness and appreciation of students. In short, most participants attempted to facilitate learning communities similar, in some regards, to the Institute. The following excerpts touch upon aspects of the relational space of the Institute that were later translated into the participants' teaching practice. In linking the integrative and reflective aspects of the Institute to her own classroom, three participants said:

What I did was try to create the same kind of interdisciplinary approach to facilitate student learning and

student meaning. Every single unit I designed, I tried to design with the goal being that students would pull from the unit. . . what they needed to make their own personal meaning. And that was really successful. And that was probably, that was the best year of teaching that I had had until that point. And it was the most exhausting year because it meant constantly being on your toes, there was no letting down. Because I was more aware, it was like being hypersensitive to teaching and learning. It was like every nerve was sensitive. Almost like I was outside myself watching myself and watching them, that interaction, how was it different, how did it work. (19472)

Most of the kids. . . are pretty much geared to a multiple-choice situation in life. And I think one reason I like to have them make more connections is realizing that there is not A, B, C, or D for everything. And the only way to do that a lot of times is bring it to their attention and so they start looking for connections. (8217)

I really try to encourage them in their studies and in their research for their paper to go beyond just what they know from their English class I'm more interdisciplinary, I guess I'm trying to say. . . . I want to encourage students to use more of their background in English, and then to use what they know in English in their math classes or science

classes--and to make a more integrated study. . . to make it more universal. (13900)

Others focused on their efforts to allow for the creation of relational space through student interactions based on challenge, openness, and support, and integration:

I guess I've tried to encourage my students to be more open and more creative about the way they look at things, to look at other possibilities, instead of just looking down one straight, narrow path. (17473)

I think the biggest thing is to depend upon each other. I break my AP class into teams now, so they do everything except take tests together. They do notebooks together, they do all their assignments together, you know, I don't really care. They talk about cheating from each other, but they learn to work together as a group and that's one of the things I got from the Institute. (11999)

I try to challenge their way of looking at the world a little bit differently I think now than I did then. And I think my kids respond pretty well to it. It's like, wow, I'd never thought about that, you know. So it's nice to have them thinking about these things. (10498)

Not every participant noted changes in educational philosophy or technique emanating from the Institute. Those who saw themselves as helpless to alter their own teaching parameters experienced little change in their own teaching practice. One participant conceded:

I would want to say that I would come back to the classroom and I was--if the right opportunity presented itself and the class was leaning toward that way, I would say let's just learn this and I'm not going to test you on it. I'd like to say that I had that attitude, but I don't know that I did. You still have to have your curriculum, you still have your regular body of things that you have to teach and so you just go back to reality. (16120)

Synoptic Meanings Related to Personal Understanding

. . . . the change that these people felt when they started seeing it all connect and making sense. . . . I realized the need for kids to start that because neat little bundles is not where its at anymore. (8217)

Many Stokely Fellows discovered or invented strategies and ideas that could be translated to their own classrooms. Many of the same participants were also less instrumental in their outlooks. In this regard, the Institute became for them an "Outward Bound for your brain" (11464), a place where they became "excited about learning again" (14737):

I guess it was the most unique set of college courses that I have taken because in every education course, it seems like

the push is always on, you know--tell me how you're going to use this in your class, adapt this to fit your classroom. And with Stokely, the treat to me was just being able to absorb what I was capable of and enjoy learning for the sake of learning and not being held accountable for every last scrap, you know, directly back to the classroom. (17473)

Learning

It was a wonderful time to re-discover myself as a learner rather than all the other roles that I play. (11464)

It was a great experience if you really like to read and learn--if you just want to go up there and take a bath in your courses. (15327)

During one interview, the participant noted how her own perspective on learning had changed since her participation in the Institute: "It's not the answer I look for, it's the journey there, you know, that I really enjoy" (21195). Learning by Stokely Fellows may be understood as a process of moving from Learning I and II to Learning III. In a very real sense, participants were engaged in "find[ing] out how to learn again" (13900). Part of this learning (Learning I and II) involved fitting different facts within concepts or models, some of which were supplied by the selected curriculum. Learning III occurred at the Institute when participants become challenged within a supportive environment to explore the questions and anomalies that become focal when their own experience or that of others was placed upon any of the templates supplied by Learning II. This exploration of new territory is discussed by McWhinney (1993) as it relates to the insights that initiate

change. McWhinney does this in part by using Berman's (1981) elaboration of Bateson's categories:

Berman (1981, p. 346) defines Learning III as 'an experience in which a person suddenly realizes the arbitrary nature of his or her own paradigm.' This is learning itself, but more important it is the learning to work from spaces beyond our habitual bondage. We are most likely to have touched this level in a sudden understanding of a person who is very different than ourselves . . . we can grow in appreciation of other realities by deep exploration and co-work with people of other realities. Learning III operates beyond the logics of the learning process and schemes for categorizing, unconstrained by the groundings that have made life both secure and problematic for prior millennia of human life (p. 60).

Berman's description of Learning III is clearly constituted in this participant's remarks:

I think of what I can learn next, and how I could be less prejudiced and more open and more accepting and, it just makes you, I think I want to grow and expand and reach out and do things I've never tried before, and know I can. It makes me a happier person really. (14432)

Participants contrasted their new appreciation of what learning may entail with previous experiences of formal learning:

And very few classes I ever took do I remember being stimulated. I remember things and I remember working and I remember learning, but I don't remember being excited about a whole lot of what I learned. Graduate school was a little better. As I matured, I really started learning, liking learning better I think, and so I found out at the Institute that if I could be challenged without having to be competitive, that is the absolutely best way for me to learn, and that is an exciting, vibrant learning rather than learning to make a grade. So that changed my whole perspective on myself as a learner, and as a life-long learner. (11464)

For some participants their learning at the Institute clarified the inseparable linkage of knowing and doing as a personally-constructive act that bridges many domains of experience:

The only way to learn how to think is to do it yourself. You really can't teach people how to think unless you, yourself, have done some. And I think that's one thing that it does--it gives you the opportunity to think. It also doesn't make the answer in the answer book always right.

What I think I've come to totally believe is that to be an educated person, you have to dig into lots of stuff . . . it

involves a requirement that you go into art, that you go into performance things, giving speeches, sing, play musical instruments, drums, geology, handle snakes . . . pick up the python to see about the little feet that are back there . . . If you're going to teach, then you have to come from a broad base of understanding. And you start teaching from the extras. You can't just stay one day ahead--you can't teach the textbook. You have to see how it all fits. It's not just this guy over here with his stuff and this guy over here with his stuff. (13213)

Broadened Perspectives

Some participants came to the Institute seeking contact with people and ideas that would help to widen their own horizons:

I wanted to tax my brain a little and get back in the mode of learning things. . . and I really went just to learn. And I was anxious to brush shoulders with people who knew a lot, and who know a lot, and who, you know are streetwise. . . .

Because I still shelter myself some even though I'm on my own. (14207)

Others saw the Institute as an opportunity to broaden perspectives of some conservative individuals:

. . . our experience was one of exposure, broadening the thinking for a lot of very conservative people . . . an

opportunity for them to become more sensitive to other ways of looking at things besides the way they have always been. (21281)

As participants reflected on the Stokely experiences, most acknowledged changes in the ways they viewed themselves within the world. One participant described the Institute as "a very intensive five-week program which gave you the opportunity to explore disciplines you may or may not have prior knowledge of, but that you would learn hopefully, discovering yourself in other ways" (13900). Some concentrated on broader perspectives that grew out of challenge to long-held belief systems, and others talked more in terms of broader ways of knowing their world:

And I'd never thought about his point that discoveries in science are like great works of art So it was really unique, a different approach to look at it. But I very much agreed with him--I could easily see his point on what he was accomplishing, and as for learning anything new or different in science, I don't imagine I learned it, but just opened my mind to a completely different way of how to look at it and look at the whole picture. (17473)

. . . it went beyond my expectations. Yeah, I'd taken other classes since my B. S. degree, looking for that revitalization. Not! It's a unique design in the college experience. I think that I probably didn't anticipate that it was going to touch

on so many of my personal beliefs, curiosities, questions, ideas, that I don't generally share with a whole lot of people. (10743)

I've never taken any political science classes except what was required in undergraduate school, and natural science has never been a big thing of mine. I'm more literature, English things, and so just to stretch to do those things, to look at the cadavers, handle all the parts, and do the genetic experiment just really, I got excited about learning again. And I took that excitement back. (14737)

Renewal and "Growth for Old People"

. . . if everybody would just change a little thing, a lot of change is going to happen. (10299)

I probably would have to say that I had my largest intellectual growth spurt during that five weeks. (10743)

In describing her experience at the Institute, one participant said, "it was mental, it was emotional, it was social, it was physical, the whole thing. It was like making, taking people who had reached that point where they were just kind of dead and bringing [them] back to life" (19093). This is reflected in the following excerpt that came from an interview with a middle-aged man who saw his experiences at the Institute as the beginning to the end of an expected stasis that is often associated with maturity:

I don't know what would have happened if I had not gone to the Institute. Would I have plodded through another year, and be plodding through this one and just be plodding along like forever. Some things changed in my life, you know. I'm fifty-two years old, for crying out loud—things are supposed to start being sane. You get your kids grown and get them out. You get your kids grown and get them out. You have your grandkids come in every once in a while. Nice guy. Goes home. And your start looking in just a few years to retire, you know, those things ought to be. And Stokely stopped that for me. But for my mind, it was the healthiest thing that ever happened to me in my whole life. (13213)

Another participant discussed another part of the personal inventory that many participants engaged in as a result of their Stokely experiences:

The measure of my success became how I felt about it. Stokely helped me get to that. Within that next year, I decided when I was walking around that campus, I didn't feel so physically good—you know, I really need to look at my whole life. That next summer I gave up sugar completely. Over the past four years I've lost about seventy pounds, and all of it came about with this idea: it's not making an A, it's changing where you are. So it was kind of an internal thing, and I think it started about that time. Now I don't know if it would have happened without the Institute or not, but

what Stokely really gave me was the sense of achieving without reaching a goal, a specific goal. So I think that was pretty significant. It just may have been that it was the convergence of a lot of things happening all at once, but that was certainly a part of it. (11678)

Another participant admitted that prior to the Institute she “was getting kind of cynical about [her] job and the system” and that she had discovered “a refreshing new way for me to look at myself and look at how I can improve my programs and help students” (14737). Another said, “the Institute gave me a renewed sense of self . . . a new sense of my own place in wherever I am” (11678). Still another found that she was “given so many wonderful opportunities to re-create and to improve [her] self-concept You’re made to feel very important as a teacher, you’re made to be glad you’re a teacher, and want to be a better teacher” (14207).

The wide latitude for expressions of growth is pointed out in the following remarks:

They said it was going to be a personal growth experience and I’d never . . . been in one of those--it’s always go to school so that you can learn something to carry back to the classroom and use it. This was something just--you’re on your own, whatever you want to do, however you want to go, how deep you want to get into this. (13031)

Former Fellows have found various ways to express their continuing growth. One remarked, “I’ve done some volunteer work

now--I never did before. I just came back charged up to be a better citizen and a better person. Some of that wore off (laughs), but really I did, I came back excited about being alive" (14737). Others expressed similar sentiments regarding renewal and growth:

. . . . when I came back, I felt refreshed not in terms of resting a lot, but I felt refreshed just because I'd done something just for me. That felt good. And when I started back [teaching], I felt rejuvenated even though I was tired. (16120)

The Stokely thing for me came at a time when I really needed some kind of jolt or inspiration, or I don't know what you call it, but there was a big void in my life and I considered a lot of different kinds of things like getting out, or changing, or going back to school for awhile. The oddest thing to me about the Stokely experience is that I dropped out of school for a year after that. I came to grips with some personal stuff at the Institute that I never really expected to have happen. (13031)

The personal growth that many participants recognized left some wondering if they would ever again fit in the spaces they had so recently vacated. In talking about the final seminar session when such possibilities were distinct for many, the following episode was recounted:

She really broke down and cried, and she said, 'Alright, now that I have learned all these things--now that I've grown so much, I've got to go home--I have to go back to my real conservative town What am I going to do there where everything's the way I used to be?' . . . she had really grown and I kind of worried about her, but I just don't think growth is bad. I think that it spreads out, you know, and that she will affect other people, especially the children. (21635)

Some who found that they no longer fit the places they left moved on to define new niches. Others have returned to their familiar settings with a renewed hope and confidence that renewal and growth can lead to productive change:

. . . I found in the things we did at Stokely a lot of ideas that could feed into creative solutions for those old problems, and as people start to grow and start to look at things differently, I think we can solve those problems. So if I came out with anything, I came out with a lot of hope that there's room for a whole lot of change in the world and that through education and reading, discovery, and communication with one another, these problems can be worked out. So when I teach, I teach with that perspective now--not that this is what happened or here's where we are, but if that is the background, then where are we going with it (21873).

Accomplishment and Confidence

Solutions seem to be possible that had not been possible for me up to that point. I was getting very depressed about things in the world, thinking they would never change. (21195)

For me it was just a really affirmative type of program that made me feel like I was worth something. (9472)

The affirmation that many Stokely participants experienced grew from a sense of confidence that was sustained by their own contributions within the learning community. The likelihood that they could and would contribute was a given at the outset of the Institute, and each participant was left to his own inventions as to what form that personal, shared expression would take. The worth of these expressions was measured only by their perceived sincerity, which urged participants to further reflection and examination of themselves. These explorations became, then, further validated through the continued interaction within the group. These exchanges led one participant to say, "I'm more willing to express my opinion and to volunteer answers and to share experiences that I've had in the classroom . . . actually having enough confidence in what I believe to share that belief, and that's important" (19434). Another noted that her experiences had led her to "pull out some things that you're capable of doing that you've never tried--things that you pushed back until you thought you had time--to open new doors I was tired of being the same old person" (14207). Another former Fellow expressed a new social confidence that emerged from her participation:

I was going through a [hard] time in my life. I had just recently divorced and it was kind of difficult for me, too, and I guess a lot of times, maybe just the friendships that I developed, it really helped. And I felt like I could count on those people--I could talk to them very easily, and we shared a lot of the same things, and I felt really good about that. A lot of it was just feeling better about myself, my self-concept went from the bottom on the first day to quite a bit higher by the time it was all over. (16888)

As stated earlier, meeting the personal and intellectual challenges of the Institute provided confidence that carried over into other aspects of the participants' lives in ways that are enumerated in the following interview excerpts:

. . . it was a real morale booster, boosting my confidence, my professional ability, my intelligence. You know, when I walked in the classroom that fall I had so many important things to teach them, that I just had a lot more, a belief in what I was doing as a teacher. (21635)

So the Institute gave me a renewed sense of self, I guess is what I'm trying to get at, a new sense of my own place in wherever I am. And that certainly helps you be a better teacher. If you're much less worried with what people think about how you're teaching and what you're achieving, then you've got a lot more time and energy to focus on the kids

that you're teaching and their real needs as learners rather than the dictated curriculum or the, you know, get to page 400 by the end of the year. (11678)

. . . but you see I needed that confidence to be able to do things that I believed in because you can believe in change all you want, but if you don't feel like you have the power to do it, to make that change, you're not as effective. So Stokely gave me the feeling that I had the power to do it and I had the ability to do it. And since then, I just assume I have it—you know, I just go in and do it! (21873)

I feel more competent, more confident, more appreciated, more a part of the real world, having had that [the Institute experience]. And more knowledgeable, and more appreciative of other people, and more appreciative of professors who will take time and that will reach out. (14432)

. . I think it certainly helped me to have more confidence about myself as a learner, that I could be comfortable with people who were smarter than I was, that I could be comfortable with people that I thought that I was smarter than, but that we were not all there to do the same thing. We had different roles to take, so it really doesn't matter. So in that way, it helped me have much more sense of my own self without always comparing myself from smartest to dumbest to whatever, and that confidence, oh, I can have a

place no matter what. . . somehow the Institute gave me much more confidence in my own ability to, just to be, to be less threatened by others and more appreciative of who I am. (11678)

. . . when I first started the program I felt inadequate, I felt old. I felt like I wouldn't be able to read as much, and heaven help me, I couldn't remember anything anymore, you know. So I was real insecure, and at the end of the experience I probably could have done just about anything; so it was a real morale booster, boosting my confidence, my professional ability, my intelligence (21635)

CONCLUSION

In the presentation of these findings, I have attempted to avoid overwriting the genuine eloquence of the interview participants. One may say that not writing this chapter has been more difficult than the writing of it. In a similar sense, the continuing influence of the Stokely Institute makes closure on its meanings appear arbitrary. For just as emergence of what the Stokely Institute means began as these individuals lived the experience, the emergent meaning continues to shape and be shaped by these people as they engage the reciprocally-constructive acts that characterize the interactions of living. While these words and their words provide a sort of textual edifice that signifies a description of a description of an experience, it is the experience itself that remains elusive. This is reflected in the following interview excerpt:

A: There's something about talking about the Institute-- that you never feel that you never convey to anybody else the meaning that it had for you.

Q: Say more.

A: I'm not going to.

Q: Go ahead.

A: It's like sex for the first time (laughs). . . But you know you kind of think these things about what it's going to be like and then it's totally a totally different experience. Essentially, it takes you to a different plane. . . I think I always had some urge to work toward a doctoral degree, and then I sort of imposed limits on myself, and I said if I didn't get it by the time I was forty I wasn't going to do it. And Stokely made it possible for me to come back at forty-one and start on it. And I hate to use that word, 'empower.' It's overused now, but it's a very good word to describe what the Institute did for me. And that's the reason that I don't think I can ever convey the meaning that the Institute holds for me. (12708)

What began for many Stokely Fellows as an intimidating prospect became for some a transformative learning experience that brought them closer to themselves and their own potential, to others in their diverse groups, and to the larger world. Uncertainty, intimidation, or adventure--whichever was dominant at the outset of the Institute--was transformed to challenge through collegiality, collaborative interactions, and careful

attention to personal well-being. Sustaining the rigorous intellectual and emotional challenges required a commitment to a degree of open exchange. Openness required a sense of well-being, minimal distractions, and the capacity to interact within a collaborative framework. Those who were not open or never experienced the transition to openness did not have available to them the level of interactions necessary for further phase transitions to occur. Openness did not guarantee transformational experience; it simply enabled them.

The intensity of the workload sharpened the focus on challenge and encouraged collaboration among participants. The resulting interactions defined the relational space of the learning communities that emerged. The diverse perspectives that were voiced within this community of learners provided potential sources for insights, new information, and emergent meanings. Bridging disciplines required new connections among ideas and people. To balance the rigorous demands of the readings, seminars often took spontaneous, exploratory turns; and loosely-specified response papers introduced the reflective turn through which personal meaning coalesced. Confidence grew with acknowledged accomplishment, and both fed forward into renewed immersion within a collegial atmosphere of integrative diversity. The degree of empathy and love that defined group closeness was enhanced by continuing interactions that were both intellectual and social, thus encouraging personal and shared reflection. For some, parting became difficult. Enlargement of self was realized through new connectedness with others in worlds co-constructed within the broad expanses of an emerging consensual domain.

Chapter 5

Discussion and Implications

INTRODUCTION

Autopoiesis presupposes a recurring need for renewal. Niklas Luhmann

After the titles of texts and the names of authors and even professors have faded in the memories of participants, the “Stokely experience” remains vivid for many. An appreciation of these realities leads us to reflect on how the relational space of the Institutes was constituted in ways that enabled the renewal and growth of the participants whose interactions formed that space. The difficulty associated with a causal mapping of the “Stokely experience” becomes most evident when we examine the overlapping aspects of the relational space that was described by participants as supporting, challenging, opening, and integrating. These aspects could be presumed to form links in a causal chain, but the ordering of links and the demarcations between them are not easily visualized. Nonetheless, if we were to form a chain end to end to form a closed loop, that would seem to solve the problem of a beginning or ending point. This solution, however, does not suggest which links are directly related. And even if the proper ordering of the links could be grasped, an even deeper problem persists: any consideration of how those links were formed has been left out, which is to admit to having neglected that which was intended in the first place. Supporting, challenging, opening, and integrating fit together—but how?

Clearly, a proper accounting for the experiences of the research participants exceeds the limitations of additive formulae in which causation is based upon a series of discrete events that are accounted for by a specific or generalized arithmetic. Rather, it is as if each aspect of the relational space is recursively occupied by the other three aspects, and the delineation of each contains within it those aspects that precede it and those that proceed from it, thus exhibiting the simple and infinite geometry that characterizes the space between dimensions. Each aspect of the relational space is identifiable, yet connected such that supporting, challenging, opening, and integrating may be viewed as active qualities defining a single relational space. This space was constituted by the participants' network of interactions and transformations that produced and maintained, through successive iterations, these spatial qualities that came to be identifiable through the reflexive processes of description and interpretation.

LEARNING REVISITED

The co-origination of organization and structure that typifies autopoietic learning communities contrasts sharply with participants' other experiences of formal learning. While the goals of renewal and learning were clearly delineated from the inception, the Stokely Institute never took on the characteristics associated with motivational seminars that use staged excitement to bring participants to pre-established levels of readiness or action. Clearly, the continuing influence of these Stokely experiences speaks to the power inherent in self-sustaining, interactive communities from which individual meanings are derived through

discovery and invention rather than from “persuasion and propaganda” (Stacey, 1992, p. 125)

If the experiences of Stokely participants point to the efficacy of learning ecologies based on self-organizing principles at work within dynamical interaction systems, then we may ask how other learning organizations may benefit from this understanding. These participant descriptions point up for much of modern schooling the bitter irony that stems from the inadvertent stifling of learning that occurs when attempts are made to insure that learning proceeds along pre-determined paths. By directing learning only toward pre-defined ends, novelty is sacrificed in favor of confirmation, and the processing and storage of data replaces the opportunity for creating new information and meaning. If, however, we accept the statement by Minsky (1986) that “the principle activities of brains are making changes in themselves” (p. 288), then the goals of data storage and retrieval appear dubious. This point has been elaborated by numerous writers including Varela, Thompson, and Rosch (1991), who view attempts to pre-define learning outcomes as arising from a limited view of what constitutes cognition:

Thus the usual tendency is to continue to treat cognition as problem solving in some pre-given task domain. The greatest ability of living cognition, however, consists in being able to pose, within broad constraints, the relevant issues that need to be addressed at each moment. The issues and concerns are not pre-given but are enacted from a background of action, where what counts as relevant is contextually determined by our common sense (p. 145).

Learning, then, for Stokely participants was constituted in all the levels of learning discussed in Chapter 2, but the memorable aspects for many former Fellows centers around the discovery of their capacity to generate their own patterns to connect the disparate elements of our civilization. They learned to couple the transformations that constitute the broad history of ideas and actions with their own presence, and they learned that they had power to share these realizations with others within a consensual domain. They were free to think, expected to do so, supported in their ruminations, and engaged in elaborating their thinking within a community intent upon maintaining openness and collaboration. They were, in a true sense, learning how to learn.

BETWEEN THE POLES MUCH LATITUDE REMAINS

This approach to learning represents a middle ground that occupies part of a broad expanse between two extreme positions that alternately occupy most of our attention when thinking about learning. While the proponents of these polar positions would deny any kinship, the extremes of absolutism and nihilism (Varela, Thompson, & Rosch, 1991) have much in common. Absolutism seeks to preserve what is objective and “out there” through the transfer of data that are intended to encapsulate the knowledge of the prevailing culture. From this perspective, self-organization and transformation may be acceptable pedagogical ends only if any resulting transformation locates the learner within the culturally-approved domain whose preservation is the focus of educational efforts.

Nihilism, too, displays its own suspicion of self-organized learning. Whereas the former extremism views self-organization as leading to a dangerous subjectivism that may undercut reality and the prevailing values that are perceived to be based upon it, the latter dismisses self-organized learning because it does not direct transformation toward the singular realization of the oppressive nature of the prevailing culture.⁶ In short, self-organization becomes suspect because, as a pedagogical approach, it prefers to engage evolution rather than revolution. In the more conventional extremism, absolutism marshals an appeal to externally-determined laws and principles. In the more recent manifestations of nihilism, the intent seems to be the imposition of a rigid subjectivism that impoverishes the power to make distinctions. And since the making of distinctions is the basic cognitive act, learning is replaced by a recognition of the monolithic disorder that aspires to replace the prevailing hegemony.

For either extremism, the primary problem that self-organized learning presents is that there is no guarantee of where transformational learning will lead, and this is anathema to efforts aimed at direct learning outcomes. Such efforts may be seen as manifestations of a “Cartesian anxiety” (Varela, Thompson, & Rosch, 1991) that occurs as stable foundations are perceived to be threatened: “. . . either we have a fixed and stable point where knowledge starts, is grounded, and rests, or we cannot escape some sort of darkness, chaos, and confusion” (p. 140). This phenomena is not restricted to absolutists or nihilists, but can be seen even

⁶ This position only remains tenable as long as there is a hegemony to counter, and this has led some detractors such as Marquard (see *Farewell to Matters of Principle*, Oxford University Press, 1989) to characterize these academic theorists as “those who live for the revolution and by its non-arrival.”

in recent constructivist literature (Duit, 1995; Saxe, 1995; Wood, 1995) that concentrates efforts to learn on the construction of individual meanings by learners. The more developmentally-oriented constructivists (Duit, 1995) emphasize the importance of cognitive conflict and reflection in creating conceptual change. Others such as Saxe (1995) view learning as an increase in complexity of thought that is attributable to social interactions within a culture. The “Cartesian anxiety” becomes apparent (to the teacher at least) in both positions when students refuse or are unable to understand that their own meanings are out of sync with those the lesson is intended to foster (Wood, 1995).

This problem, it seems, arises from confusing meaning with understanding or, at least, for thinking that some phenomenon can mean something without first understanding it. All of these writers give little attention to insight, which we know precedes understanding; and even less attention is provided to the distinctions between understanding as a comprehension of being, and meaning, which involves judgment as to the intention of being. To express concern for the applicability of constructivism as a pedagogical technique may be legitimate; to base that concern upon incidents in which students never recognize their own preunderstandings as barriers to understanding and meaning is to mistake a weakness in practice for a failure of principle.

Let us create a scenario to clarify this point. We know that the Stokely Institutes were formed by the interactions and transformations of the structural entities that comprised these learning ecologies. The relational space within which the program, professors, and participants operated was constituted by supporting, challenging, opening, and integrating. We may see these inextricably-connected aspects as crucial for

the emergence of transformative learning experiences. The imposition of a Piagetian or a Vygotskian bias by a teacher or the imposition of pre-determined outcomes would not only delimit the emergence of an autopoietic interaction system in favor of an outwardly-controlled (allopoietic) system; it would also tend to exclude or de-emphasize particular aspects of the relational space in favor of others. We can imagine a Vygotskian classroom emphasizing consensus through integration, or we may see a Piagetian classroom emphasizing cognitive conflict through challenge. With any aspect of the relational space de-emphasized by outward manipulation, one may expect imbalances that will likely restrict learning. In a Vygotskian setting where challenge is de-emphasized by favoring integration, we may imagine a rising degree of consternation by a teacher as her students, whether children or adults, engage in some wildly-imaginative shared meanings based upon some rather naive common sense understandings that may neither overlap nor border the horizons of known experience, including those of the teacher. On the other hand, the Piagetian emphasis on challenge may short-circuit crucial aspects of support, thus creating a resistance based on perceived threat. In the first case, the otherwise constructivist classroom becomes threatened by meanings disconnected from a tradition of understanding; in the latter case, individual development is avoided by a recalcitrance grounded in intimidation. In either case, the teacher once more is tempted to arbitrate reality, thus imposing a degree of rigor that may invalidate the exploration she had hoped to encourage.

At this point we are reminded Bateson's (1979) remark that "imagination without rigor is insanity; rigor without imagination is paralytic death" (p. 219). Unfortunately, Bateson's wise observation does

not lead us to an understanding of how to achieve a balance of rigor and imagination that eschews the comfortable, inadequate certainties of objectivism and subjectivism—or the ontological insecurity associated with an incomplete constructivism. We can see, however, in the relational space of the Stokely participants the necessary balance achieved between support and challenge, and between openness and integration. We can see, too, that underlying were aspects of collegiality and a strong sense of collaboration to balance the various levels of expertise and the desire to be the best. There is the sense of shared adventure to balance the individual quests and respect to temper differences. Foremost, perhaps, there is the realization that community grows in proportion to the growth of its individual members, whose own growth is proportionate to the sharing of that growth within the domain that enables it.

COMPLEXITY REVISITED

Questions regarding the relevance or irrelevance of complexity theory and autopoiesis to the present research arise when we ask if or how an understanding of these principles alters, in any way, our understanding of the eloquent participant descriptions that constitute the core of this study. Obviously, the Stokely Institutes were conceived and carried out with a clear disregard for conceptual understandings of either self-organizing, complex systems or dynamic systems theory. What benefits, then, can be expected to accrue from the linking of some theoretical generalizations concerning emergent properties to some wonderfully-specific examples of growth through open inquiry? Or do these

theoretical considerations obfuscate in ways that hinder a clear understanding of these experiences of former Stokely Fellows?

If the reader could have been expected to conclude from the descriptions that these experiences by Stokely participants did not occur as a result of an outwardly-managed plan, but, rather, through the interactions and transformations of individuals engaged in exploratory exchanges, then our introduction to principles of autopoiesis would have been unnecessary. If the establishment of this and other learning ecologies would have been understood as an endogenous process whose healthy growth remains consistent with but unspecified by the environment, then there would have been no need for a further explication of the role of adaptation in complex systems. If the participant descriptions assured an understanding that the capacity for open interactions and insights became known through the process of openly interacting within a space generated and maintained by those interactions, then there would have been no need to advance an epistemology that treats knowing and doing as aspects of a single phenomenon we call knowledge. Finally, if meaning had been understood as the naturally-recurring outgrowth of insight, understanding, and judgment, then there would have been no need for helical metaphors to symbolize the iterations that constitute the evolution of interaction systems.

There is no test, however, to determine if these connections would have occurred naturally or if they were helped along by our parallel discussion of self-organizing systems. Fortunately, the value of linking participant descriptions to the study of self-organizing systems does not rest upon the probability of certain preferred insights emerging. What is

worthwhile, rather, rests with the potential for understanding meanings as emergent phenomena whose origins and subsequent transformations provide the locus for a field of inquiry concerned with dynamical relations.

Perhaps an additional value of linking human transformations with our understandings of the emerging sciences of complexity will become more evident as new investigations openly explore that which has remained neglected because of its failure to fall within the purview of science. Packard (1992) has pointed out that, indeed, the history of science reflects a capitulation in coming to understand the dynamics of change: "From the Greeks to the present—because science got tied up in deriving things from fundamental law—the idea of change as having its own reality got left by the wayside. There was an intellection bifurcation, and the creative aspects of the world became religious questions" (p. 97).

The resulting bifurcation left science, then, without a clear interest in the process that directs its advance. Reflection upon the history of our own transformations as individuals and as a civilization reveals that every subsequent certainty that we attain is an artifact of the process of change that sustains our advance into the unknown. However, the demand for certainty has directed our advance from one orthodoxy to another—or to the perpetuation of myth-making (Lonergan, 1958):

. . . the elimination of one myth tends to coincide with the genesis of another and the advance of science and philosophy implies merely that the later myths will be complemented and defended by appropriate philosophies and made effective

through the discoveries of science and the inventions of technology.

So we are brought to the profound disillusionment of modern man and to the focal point of his horror. He had hoped through knowledge to ensure a development that was always progress and never decline. He has discovered that the advance of human knowledge is ambivalent, that it places in man's hands stupendous power without necessarily adding proportionate wisdom and virtue, that the fact of advance and the evidence of power are not guarantees of truth, that myth is the permanent alternative to mystery and mystery is what his hubris rejected (Lonergan, p. 549).

Part of the impetus for advances in the understanding of complexity lies in the reflexive nature of the search, since the underlying principles reflect an understanding that emergent properties can only be described by describers—and that every explanation derives from explainers. The focus for understanding, then, is continually adjusting and being adjusted within a boundary that includes the object of investigation and the investigating of it. This means that the distinct possibility exists for developing inquiry methods that direct us toward an appreciation of our connectedness within worlds that our insights are capable of re-opening in ways that make the world continually new.

AUTOPOIESIS REVISITED

The ethical dimension associated with self-organized learning communities and the study of them is implicit within the ontology from which the principles of *autopoiesis* are derived. Inasmuch as realities are grounded in the acts of bringing forth worlds (Maturana & Varela, 1987) within consensual domains (Maturana, 1978), the opportunity to organize our individual lives becomes inextricably linked with the opportunity for others to do likewise within an environment that does not exceed our adaptive capacities. Much of the inequity among social organizations reflects a lack of understanding of this basic premise. The conditions prevailing in schools and universities that make the Stokely Institute sometimes appear as an aberration are conditions of the larger phenomenon witnessed when organizations attempt to preserve themselves by restricting the necessary dynamics of the interacting members that comprise them. Once the confirmatory becomes repeatedly emphasized, novelty is diminished, and interaction levels move toward stasis. As the underlying principles of self-organizing systems remind us, if the interactions that sustain the organization's unity are interrupted, "after a while you don't have any more unity to talk about" (Maturana & Varela, 1987, p. 46).

Now if the notion of self-organization is as applicable for social organizations as it is for biological ones, then one may ask why we witness a lack of growth as well as stability in many of our social systems—from schools to societies. As suggested earlier, this situation is partly attributable to organizations being subjected to scientific management techniques that seek to sustain order by limiting open interactions within

the system. In the Preface to *Autopoiesis: The Organization of the Living*, Beer (1980) asserts that social organizations may be classified as living and, thus, autopoietic. This being the case, one may wonder how an autopoietic interaction system becomes subjected to control measures that appear to jeopardize its continued autopoiesis. The problem arises in autopoietic organizations that contain lower-level organizations and that are contained within higher-level organizations. Beer points out that, while autopoietic organizations most often view their own level as autopoietic, the levels below them and above them are seen as being externally controlled (allopoietic). We need look no further than school systems or universities for examples of this phenomenon. We see this in reform efforts that most often originate from levels that are least often affected by the demands of those reforms. Beer views this problem as endemic in efforts to introduce change:

. . . it seems to me that the architects of change are making the same mistake all over the world. It is that they perceive the system at their own level of recursion to be autopoietic, which is because they identify themselves with that system and know themselves to be so; but they insist on treating the systems their systems contains, and those within which their system is contained, as allopoietic. This is allowable in terms of scientific description, when the input and output surfaces are correctly identified. Nonetheless it is politically blind to react towards the container and contained systems in a way which makes such a model evident, because at these levels of

recursion the relevant systems perceive themselves as autopoietic too (p. 72).

There appears, too, in some conceptions of human organizations an organismic metaphor that has contributed to the de-emphasis on individual development of meaning in favor of the sustainability of the larger organization. As Maturana and Varela (1987) have pointed out, biological organisms sacrifice the plasticity of their components in favor of the overall organization of the organism. However, this contrasts to human social systems in that “. . . coherence and harmony in relations and interactions between the members of a human social system are due to the coherence and harmony of their growth in it, in an ongoing social learning which their own social (linguistic) operation defines . . .” (p. 199). In social organizations that “embody enforced mechanisms of stabilization” (p. 199), we witness a loss of energy and vitality, for it is only through the generation of new in-formation arising from interactions with self and others that social organizations, and the social organisms that constitute them, remain viable.

Despite efforts to predict and control, the creative aspects of the evolutionary process, whether at phylogenetic or ontogenetic levels, guarantee that “there are certain points beyond which you can’t derive what is going to happen at the next level of complexity” (Packard, 1992, p. 97) What we can predict with some confidence is that subsequent levels will emerge if networks of interactions and transformations that makes emergence possible are allowed to generate themselves. Whether we successfully extend the possibilities for self-organizing and adaptive behavior to social systems such as schools may determine whether we

experience change as cycles of stasis followed by catastrophe or as a continuing poised equilibrium punctuated by successive changes that characterize healthy growth.

CONCLUDING

. . . to the degree that it is 'real,' a change is not logical; and, conversely, to the degree that it is logical, it is not 'real.' Will McWhinney paraphrasing Einstein

As the participant at the end of the last chapter suggested, the understanding and communication of "Stokely experiences" may be limited by the degree to which logical explanation can convey a transformational experience that is beyond logic. Perhaps there is no better ending, then, than one whose generative form resists the summative in favor a self-similar patterning that is embedded within the geometry of change:

XII⁷

Will transformation. Oh be inspired for the flame
in which a Thing disappears and bursts into something
else;
the spirit of re-creation which masters this earthly form
loves most the pivoting point where you are no longer
yourself.

What tightens into survival is already inert;
how safe is it really in its inconspicuous gray?
From far off a greater hardness warns what is hard,
and the absent hammer is lifted high!

He who pours himself out like a stream is acknowledged
at last by Knowledge;
and she leads him enchanted through the harmonious
country
that finishes often with starting, and with ending begins.

Every fortunate space that the two of them pass through,
astonished,
is a child or grandchild of parting. And the transfigured
Daphne,
as she feels herself become laurel, wants you to change
into wind.

⁷ Sonnet II, 12 from *The Sonnets to Orpheus* by Rainer Maria Rilke, translated by Stephen Mitchell, New York: Simon and Schuster, 1985.

REFERENCES

REFERENCES

- Barlow, C. & Waldrop, M. (1994). Worldview extensions of complexity theory. In C. Barlow, (Ed.), *Evolution extended: Biological debates on the meaning of life*. Cambridge: MIT Press.
- Baseeches, M. (1984). *Dialectical thinking and adult development*. Norwood, NJ: Ablex.
- Baskett, H. & Hill, L. (1990, February). *Enhancing professionals' autonomous learning: A report of an action demonstration project*. Paper presented at the Fourth International Symposium on Adult Self-Directed Learning, Norman, OK.
- Bateson, G. (1972). *Steps to an ecology of mind*. New York: Ballantine Books.
- (1979). *Mind and nature: A necessary unity*. New York: Bantam.
- Beer, S. (1975). Preface. In H. Maturana & F. Varela, *Autopoiesis and Cognition: The realization of the living*. Dordrecht: Reidel.
- Benseler, F., Hejl, P. & Köch, W. (Eds.). (1980). *Autopoiesis, communication, and society: The theory of autopoietic systems in the social sciences*. Frankfurt/New York: Campus Verlag.
- Berman, M. (1981). *The re-enchantment of the world*. Ithaca, NY: , Cornell University Press.
- Bloom, J. (1992). Contexts of meaning and conceptual integration: How children understand and learn. In R. Duschl & R. Hamilton (Eds.), *Philosophy of science, cognitive psychology and educational theory and practice* (pp. 177-194). Albany, NY: State University of New York Press.
- Blumer, H. (1969). *Symbolic interactionism*. Englewood Cliffs, NJ: Prentice-Hall.
- Bohm, D. (1980). *Wholeness and the implicate order*. London: Routledge and Kegan.

- Bruns, G. (1992). *Hermeneutics ancient and modern*. New Haven: Yale University Press.
- Brooks, D., & Wiley, E. (1988). *Evolution as entropy: toward a unified theory of biology*. Chicago: The University of Chicago Press.
- Chickering, A. W. (1976). Developmental change as a major outcome. In M. T. Keeton and Associates, *Experiential learning: Rationale, characteristics and assessment*. San Francisco: Jossey-Bass.
- Cohen, J. & Stewart, I. (1994). *The collapse of chaos: Discovering simplicity in a complex world*. New York: Viking Penguin.
- Cooley, W. & Bickel, W. (1992). The role of evaluation in the development of the center. In A. Rud Jr., and W. Oldendorf (Eds.), *A place for teacher renewal: Challenging the intellect, creating educational reform*, (pp. 112-127). New York: Teacher's College Press.
- Cziko, G. (1989). Unpredictability and indeterminism in human behavior: arguments and implications for educational research. *Educational Researcher*, 18 (3), 17-25.
- Darling-Hammond, L. (1993). Reframing the school reform agenda. *Phi Delta Kappan*, 74, 754-761.
- Dennett, D. (1991). *Consciousness explained*. Boston: Little, Brown.
- DePryck, K. (1993). *Knowledge, evolution and paradox: The ontology of language*. Albany, NY: State University of New York Press.
- Dostal, R. (1994). The experience of truth for Gadamer and Heidegger: Taking time and sudden lightning. In B. Wachterhauser (Ed.), *Hermeneutics and truth*, (pp. 47-67). Evanston, IL: Northwestern University Press.
- Douglass, B. & Moustakas, C. (1985). Heuristic inquiry: the internal search to know. *Journal of Humanistic Psychology*, 25, 39-55.
- Duckworth, E. (1987). *The having of wonderful ideas and other essays on teaching and learning*. New York: Teacher's College.

- Duit, R. (1995). The constructivist view: A fashionable and fruitful paradigm for science education research and practice. In L. Steffe & J. Gale (Eds.), *Constructivism in education*, (pp.271-286). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Fellows Program: June 19-July 22, 1988.* (1988). Unpublished, University of Tennessee, Knoxville.
- Fleischaker, G. (1988) *Autopoiesis: System logic and origins of life*. Unpublished doctoral dissertation. Boston University.
- Frick, W. (1983). The symbolic growth experience. *Journal of Humanistic Psychology*, 23, 108-125.
- Frick, W. (1987). The symbolic growth experience: Paradigm for a humanistic-existential learning theory. *Journal of Humanistic Psychology*, 27, 406-423.
- Frick, W. (1990) The symbolic growth experience: A chronicle of heuristic inquiry and a quest for synthesis. *Journal of Humanistic Psychology*, 30, pp. 64-79.
- Gadamer, H. (1976). *Philosophical hermeneutics*. Berkeley: University of California Press.
- Gell-Mann, M. (1994). *The quark and the jaguar: Adventures in the simple and the complex*. New York: W. H. Freeman and Company.
- Glaser, B. & Strauss, A. (1967) *The discovery of grounded theory*. Chicago: Aldine.
- Gleick, J. (1987). *Chaos: Making a new science*. New York: Viking Penguin Inc.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. Boston: Northeastern University Press.
- Goodwin, B. (1994). *How the leopard changed its spots: The evolution of complexity*. New York: Charles Scribner's Sons.
- Gordon, W. (1961). *Synectics: The development of creative capacity*. New York: Collier.

- Gould, R. (1978). *Transformation: Growth and change in adult life*. New York: Simon and Schuster.
- Greene, M. (1992). Foreword. In A. Rud Jr. & W. Oldendorf (Eds.), *A place for teacher renewal: Challenging the intellect, creating educational reform*, (pp. 45-62). New York: Teacher's College Press.
- Greenstein, G. (1988). *The symbiotic universe: Life and mind in the cosmos*. New York: William Morrow.
- Gunnar, M. & Thelen, E., (Eds.). (1989). *Systems and development: The Minnesota symposia on child psychology. Vol. 22*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Haken, H. (1988). *Information and self-organization: A macroscopic approach to complex systems*. Berlin: Springer-Verlag.
- Hekman, S. (1986). *Hermeneutics and the sociology of knowledge*. Notre Dame: University of Notre Dame Press.
- Holland, J. (1975). *Adaptation in natural and artificial systems*. Ann Arbor: University of Michigan Press.
- Jantsch, E. (1980). *The self-organizing universe*. Oxford: Pergamon Press.
- Kauffman, S. (1993). *The origins of order: Self-organization and selection in evolution*. New York: Oxford University Press.
- Kelly, G. (1963). *A theory of personality: The psychology of personal constructs*. New York: W. W. Norton.
- Kelso, J. (1990). Phase transitions: Foundations of behavior. In H. Haken & M. Stadler, (Eds.), *Synergetics of cognition*, (pp. 249-268). Berlin: Springer-Verlag.
- Klein, J. (1990). *Interdisciplinarity: History, theory, and practice*. Detroit: Wayne State University Press.
- Knefelkamp, L. L. & Slepitz, R. (1978). A Cognitive development model for career development: An adaptation of the Perry scheme. In C. Parker (Ed.), *Encouraging development in college students*. Minneapolis: University of Minnesota Press.

- Kohlberg, L. (1969). Stage and sequence: The cognitive developmental approach to socialization. In D. Goslin (Ed.), *Handbook of socialization theory and research*, (pp. 347-480). New York: Rand-McNally.
- Kolb, D. A. (1981). Learning styles and disciplinary differences. In Chickering, A. W. & Associates (Eds.), *The modern American college*, (pp.232-255). San Francisco: Jossey-Bass.
- Kolb, D. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.
- Krippendorff, K. (1994). A recursive theory of communication. In D. Crowley & D. Mitchell (Eds.), *Communication theory today*, (pp. 78-104). Cambridge, UK: Polity Press.
- Kuhn, T. (1970). *The structure of scientific revolutions*. Chicago: University of Chicago Press.
- Kuppers, B. (1990). *Information and the origin of life*. Cambridge: MIT Press.
- Laszlo, E. (1987). *Evolution: The grand synthesis*. Boston: New Science Library.
- Lewin, R. (1992). *Complexity: Life at the edge of chaos*. New York: Macmillan Publishing Company.
- Lincoln, Y. and Guba, E. (1985) *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Livesey, L. (1972). Noetic planning: The need to know, but what? In E. Laszlo (Ed.), *The relevance of general systems theory: Papers presented to Ludwig von Bertalanffy on his seventieth birthday*, (pp. 145-162). New York: George Braziller.
- Lonergan, B. (1958). *Insight: A study of human understanding*. New York: Philosophical Library.
- Luhmann, N. (1990). *Essays on self-reference*. New York: Columbia University Press.

- Maturana, H. (1978). Biology of language: The epistemology of reality. In G. Miller & E. Lenneberg (Eds.), *Psychology and biology of language and thought: Essays in honor of Eric Lenneberg*, (pp. 27-63). New York: Academic Press.
- Maturana, H. (1980). Man and society. In F. Benseler & W. Koch (Eds.), *Autopoiesis, communication and society: The theory of autopoietic systems in the social sciences*, (pp. 11-31). Frankfurt: Campus Verlag.
- Maturana, H. (1987). Everything is said by an observer. In W. Thompson (Ed.), *Gaia, a way of knowing: Political implications of the new biology*, (pp. 65-82). Hudson, NY: Lindisfarne Press.
- Maturana, H. & Varela, F. (1980). *Autopoiesis and cognition: The realization of the living*. Boston: Reidel.
- (1987). *The tree of knowledge: The biological roots of human understanding*. Boston: New Science Library.
- McCulloch, W. & Pitts, W. (1943). A logical calculus of the ideas immanent in nervous activity. *Bulletin of Mathematics and Biophysics*, 5, 115-133.
- McWhinney, W. (1992). *Paths of change: Strategic choices for organizations and change*. Newbury Park, CA: Sage.
- Meynell, H. (1976). *An introduction to the philosophy of Bernard Lonergan*. London: Macmillan.
- Mezirow, J. (1978). Perspective transformation. *Adult Education*, 28, 100-110.
- Mills, C. (1959). *The sociological imagination*. New York: Oxford University Press.
- Minsky, M. (1986). *The society of mind*. New York: Simon and Schuster.
- Moustakas, C. (1990). *Heuristic research: Design, methodology, and application*. Newbury Park, CA: Sage.

- Nelson, A. (1990). *Application of chaos theory to the understanding of psychological transformation*. Unpublished doctoral dissertation, Pepperdine University.
- Oyama, S. (1989). Ontogeny and the central dogma: Do we need the concept of genetic programming in order to have a evolutionary perspective? In M. Gunnar and E. Thelen (Eds.). *Systems and development: The Minnesota symposia on child psychology*. Vol. 22, (pp. 1-34). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Oyama, S. (1985). *The ontogeny of information: Developmental systems and evolution*. Cambridge: Cambridge University Press.
- Packard, N. (1992, January). Norman Packard. *Omni*, 14, pp. 85-89.
- Padilla, R. (1991). *Hyperqual Version 4.3* [Computer Program]. Chandler, AZ: Author.
- Pask, G. (1976). *Conversation theory: Applications in education and epistemology*. Amsterdam: Elsevier.
- Perry, W. G., Jr. (1970). *Forms of intellectual and ethical development in the college years: a scheme*. New York: Holt, Rinehart & Winston.
- Perry, W. G., Jr. (1981). Cognitive and ethical growth: The making of meaning. In A. Chickering, (Ed.), *The modern American college*, (pp. 76-115). San Francisco: Jossey-Bass.
- Piaget, J. (1952). *The language and thought of the child*. London: Routledge and Kegan Paul.
- (1932). *The moral development of the child*. London: Routledge and Kegan Paul.
- (1954). *The construction of reality of the child*. New York: Basic Books.
- Polkinghorne, D. (1988). *Narrative knowing and the human sciences*. Albany, NY: State University of New York Press.
- Prigogine, I. & Stengers, I. (1984). *Order of chaos: The evolutionary paradigm and the physical sciences*. New York: Bantam.

- Redner, H. (1994). *A new science of representation: Towards an integrated theory of representation in science, politics and art*. Boulder, CO: Westview Press.
- Rud Jr., A. (1988, April). *Developing teacher knowledge for professional renewal: A state professional development perspective*. Paper presented at the American Educational Research Association, New Orleans.
- Rud Jr., A. (1992). Building a rationale for teacher education. In A. Rud Jr. & W. Oldendorf (Eds.), *A place for teacher renewal: Challenging the intellect, creating educational reform*, (pp. 45-62). New York: Teacher's College Press.
- Säljö, R. (1979). Learning to learn. *Higher Education*, 8 (4), 443-51.
- Saxe, G. (1995). From the field to the classroom: Studies in mathematical understanding. In L. Steffe and J. Gale (Eds.), *Constructivism in education*, (pp. 287-312). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Shea, C. (1992). NCAAT's search for a teacher renewal philosophy: An historical account. In A. Rud Jr. & W. Oldendorf (Eds.), *A place for teacher renewal: Challengeing the intellect, creating educational reform*, (pp. 1-24). New York: Teacher's College Press.
- Smith, L. & Thelen, E. (1993). *A dynamic systems approach to development: Applications*. Cambridge: MIT Press.
- Stacey, R. (1992). *Managing the unknown: Strategic boundaries between order and chaos and organizations*. San Francisco: Jossey-Bass.
- Taylor, M. (1986) Learning for self-direction in the classroom: The pattern of a transition process. *Studies in Higher Education*, 11 (1), 55-72.
- Thelen, E. (1989). Self-organization in developmental processes: Can systems approaches work? In M. Gunnar & E. Thelen (Eds.), *Systems and development: The Minnesota symposia on child psychology. Vol. 22*, (pp. 77-118). Hillsdale, NJ: Lawrence Erlbaum Associates.

- Thompson, C., Locander, W., & Pollio, H. (1989) Putting consumer experience back into consumer research: The philosophy and method of existential-phenomenology. *Journal of Consumer Research*, 16 (9), 133-146.
- Turner, V.. (1970). Symbols in Ndembu ritual. In D. Emmet & A. Macintyre (Eds.), *Sociological theory and philosophical analysis*, (pp. 150-182). New York: Macmillan.
- van Geert, Paul. (1993). A dynamic systems model of cognitive growth: Competition and support under limited resource conditions. In L. Smith & E. Thelen (Eds.), *A dynamic systems approach to development: Applications*, (pp. 265-331). Cambridge: MIT.
- Varela, F. (1979). *Principles of biological autonomy*. New York: North Holland.
- (1992). Whence perceptual meaning? A cartography of current ideas. In F. Varela and J. Dupuy (Eds.), *Understanding origins: Contemporary views on the origin of life, mind, and society*, (pp. 235-264). Boston: Kluwer.
- Varela, F., Thompson E., & Rosch E. (1991). *The embodied mind: Cognitive science and human experience*. Cambridge: MIT.
- Varela, F. & Bourguine, P. (Eds.) (1992). *Toward a practice of autonomous systems: Proceedings of the first European conference on artificial life*. Cambridge, MA: MIT.
- Vico, G. *On the most ancient wisdom of the Italians unearthed from the origins of the Latin language*. Ithaca, NY: Cornell University Press. (Translated by L. Palmer).
- Vico, G. *On the study methods of our time*. Ithaca, NY: Cornell University Press. (Translated by Elio Gianturco, 1990).
- von Foerster, H. (1984). Principles of self-organization – in a socio-managerial context. In H. Ulrich & G. Probst (Eds.), *Self-organization and management of social systems: Insights, promises, doubts, and questions*, (pp. 2-24). New York: Springer-Verlag.

- von Glasersfeld, E. (1984). An introduction to radical constructivism. In P. Watzlawick, (Ed.), *The invented reality: Essays on constructivism*. (pp. 17-40). New York: Norton.
- Waldrop, M. (1992). *Complexity: The emerging science at the edge of order and chaos*. New York: Simon and Schuster.
- Wheatley, M. (1992). *Leadership and the new science: Learning about organization from an orderly universe*. San Francisco: Berrett-Koehler.
- Widick, C. (1977) The Perry scheme: A foundation for developmental practice. *The Counseling Psychologist*, 6 (4), 35-38.
- Wolfram, S. (1986). *Theory and applications of cellular automata*. Singapore: World Scientific.
- Wood, T. (1995). From alternative epistemologies to practice in education: Rethinking what it means to teach and learn. In L. Steffe & J. Gale (Eds.), *Constructivism in education*, (pp. 331-340). Hillsdale, NJ: Lawrence Erlbaum Associates.

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