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UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

ASSOCIATION OF HISTORICAL EVENTS AND THE DEVELOPMENT OF SELF-DIRECTED LEARNING READINESS OF AMATEUR RADIO OPERATORS

A Dissertation

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

Doctor of Philosophy

By

TERRENCE RUSSEL REDDING
Norman, Oklahoma
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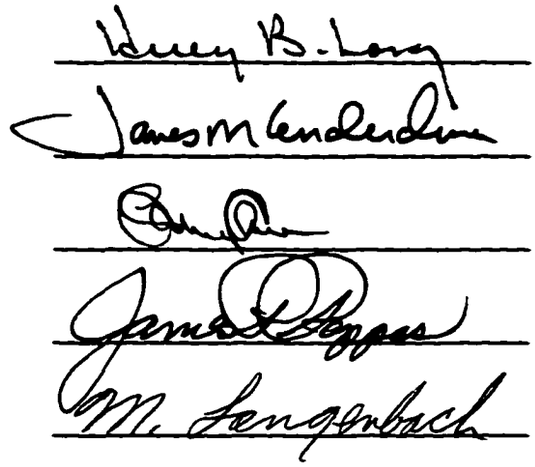
ASSOCIATION OF HISTORICAL EVENTS AND THE DEVELOPMENT OF SELF-DIRECTED LEARNING READINESS OF AMATEUR RADIO OPERATORS

A Dissertation

APPROVED FOR THE

DEPARTMENT OF EDUCATIONAL LEADERSHIP AND POLICY STUDIES

BY



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ABSTRACT

ASSOCIATION OF HISTORICAL EVENTS AND THE DEVELOPMENT OF SELF-DIRECTED LEARNING READINESS OF AMATEUR RADIO OPERATORS

BY: TERRENCE R. REDDING

MAJOR PROFESSOR: HUEY B. LONG, Ph. D.

This study was designed to determine the association between historical events and the development of self-directed learning readiness of amateur radio operators as measured by Guglielmino's (1977) Self-Directed Learning Readiness Scale. The research design was based on the following four-step procedure.

First, 262 amateur radio operators were asked to respond to eleven questions on a demographic survey and to complete Guglielmino's Self-Directed Learning Readiness Scale (SDLRS). Second, after analysis of the SDLRS, 40 respondents--20 from the highest quartile and 20 from the lowest were selected for in-depth interviews to obtain qualitative information concerning the circumstances surrounding the development of their initial interest in amateur radio. Third, micro, meso, and macro events associated with the respondents interest in becoming an amateur radio operator were identified and analyzed to find patterns of association between the events and adult self-directed learning readiness. Fourth, abnormally high and low numbers of amateur radio operators by birth year were correlated with major conspicuous events in American history to identify patterns that could be associated with the development of SDLR.

Four conclusions emerged from this investigation:

1. Self-directed learning readiness as measured by Guglielmino's SDLRS is

associated, in the sample studied, with being an amateur radio operator, sex, educational level, preference to study alone, number of hobbies, and occupation.

2. Historical events, whether micro, meso, or macro are associated with developing an interest in amateur radio, and thus by definition demonstrating high SDL. The interaction of these experiences, the age of the respondent, and the importance of the larger macro cultural framework in the development of high SDLR is unclear.

3. Respondents in the High group tended to be younger when they developed an interest in amateur radio.

4. The explanation for the association between historical events, whether micro, meso, or macro and adult self-directed learning readiness is complex.

ASSOCIATION OF HISTORICAL EVENTS AND THE DEVELOPMENT OF SELF-DIRECTED LEARNING READINESS OF AMATEUR RADIO OPERATORS

CHAPTER I

Introduction

Problem Statement

Self-directed learning readiness (SDLR) is a popular topic of study among adult educators (Confessore, Long, & Redding, 1993). Research on the topic is concentrated in several different topical areas including (a) the nature of self-directed learning (Bonham, 1989, 1991; Brookfield, 1988; Caffarella & O'Donnell, 1988; Candy, 1990, 1991; Jarvis, 1985, 1986, 1989; Long, 1988; Jones, 1989; Pratt, 1988), (b) the origins of SDLR (Guglielmino, 1977; Long & Stubblefield, 1994; Stubblefield, 1992), (c) the association of SDLR with other variables (Adenuga, 1991; Brockett, 1985a; Cloud, 1992; Eisenman, 1988; Finetone, 1984; Long, Redding & Eisenman, 1993; Stubblefield, 1992), and (d) the conceptual definition of self-directed learning (Brookfield, 1984, 1986; Knowles, 1975; Long, 1991b). Recently, investigators such as Cloud (1992), Guglielmino (1992), Long, Redding and Eisenman (1993, 1994), and Stubblefield (1992) have sought explanations for the evolvement and development of self-directed learning readiness. These investigators have studied different aspects of children's development.

For example, Stubblefield's (1992) retrospective study suggests social and parenting variables may be keys to a better understanding of how self-directed learning readiness develops or is nurtured. Cloud (1992) reports the possibility of a genetic connection, but also supports Stubblefield's findings. Long, Redding and Eisenman (1993) reveal that a group of 5th-grade students' readiness scores increased between the 5th and 8th grades; in a second report (1995), the authors note some interesting relationships between the 8th-graders' readiness scores and certain social activities. The

findings in the above studies provide support for the argument that social conditions as found in family and other social contexts may be associated with SDLR.

Long's (1989b, 1990b) analysis of the biographies of Wilder Penfield and Peter the Great suggests self-directed learning behavior may be more closely related to the micro-social context than to the broader cultural or macro-social developments. Given the nature of this study, however, it was not possible to obtain an estimate of magnitude of the self-directed learning readiness. In contrast, Schooler (1990) provides support for reasoning that individualism is associated with the macro-social context. While individualism is not the sine qua non of self-directed learning readiness, it is possible to associate the two. Long (1991c) provides a hypothetical model that may be useful in exploring the micro and macro social dimensions of self-directed learning development. It is a model that includes social context along with situational circumstances, personality, and social variables as interacting with self-directed learning. The model has not been tested, however. Thus, the research concerning the development of self-directed learning readiness is ambivalent. Schooler implies that the macro-social environment, usually referred to as culture, may contribute to the development of traits and behaviors identified with individualism. No study designed to analyze the relationship between the macro-social context, ages of individuals, and self-directed learning readiness and behavior has been identified. Thus, this study is designed to address the question concerning the relationship between self-directed learning readiness and macro-social contexts associated with selected historical periods in twentieth century United States of America.

Purpose

This research project is designed to determine the association between currently unidentified events in society and adult self-directed learning readiness as measured by Guglielmino's Self-Directed Learning Readiness Scale. More specifically, the study addresses the following research questions:

1. How are the demographic variables, such as age, sex, and educational level related to self-directed learning readiness?

2. How do individual reasons for pursuing a complex learning activity relate to levels of self-directed learning readiness?

3. What relationships, if any, exist between occupations and self-directed learning readiness?

4. Of all the variables studied, which combinations are the best predictors of self-directed learning readiness?

5. What kind of relationship exists between historical events and the number of individuals who are high in self-directed learning readiness?

Significance

This study may have both practical and theoretical significance. The impact on practice may be associated with the study's findings concerning a relationship between events in society, increased self-directed learning activities and higher levels of self-directed learning readiness. Further practical implications may result from the identification of kinds of situations, historical, social, and cultural events, that are associated with increased self-directed learning activities and to increased self-directed learning readiness.

Practice may be improved by clarifying variables that are associated with the development of self-directed learning readiness in various learning situations. For example, certain kinds of events may be more important than others in the development of self-directed learning readiness. Knowledge of the kind of events associated with the development of self-directed learning readiness could guide educators in increasing the self-directed learning readiness of students through the development of social situations that stimulate self-directed learning readiness.

Theoretical significance may emerge from an increased understanding of the nature of self-directed learning and development of self-directed learning readiness. Since both

Stubblefield (1992) and Cloud (1992) leave open the question of how self-directed learning readiness is developed, and there is speculation that its development may be associated with individual experiences (Long, Redding, & Eisenman, 1993, 1994; Long, 1989b, 1990), then it is important to be able to identify the kinds of experiences that may be associated with, or at least influence the development of adult self-directed learning readiness.

CHAPTER II

Review of the Literature

The literature of self-directed learning can be divided into three major topical areas; the nature of self-directed learning readiness, the nature of self-directed learning, and self-directed learning's origins and maintenance. Long (1988) points out that self-directed learning are not some modern phenomena, but self-directed learning is a modern research topic. Confessore (1992) considers self-directed learning and human's need to learn to be the essence of what defines the human. Others (Brookfield, 1984) have at times adopted the notion that self-directed learning is the defining characteristic of the adult learner. It is, however, a topic that requires further research and explanation (Cloud, 1992; Long, Eisenman & Redding, 1993; Stubblefield, 1992).

Nature of Self-Directed Learning Readiness

Guglielmino (1977) focused attention on the concept of *readiness* for self-directed learning when the Guglielmino Self-Directed Learning Readiness Scale (SDLRS) was developed. The SDLRS was developed to examine and explore the phenomenon of self-direction in learning (Guglielmino, 1977). With the introduction of her SDLRS she operationalized the construct and provided an important tool for conducting research into questions concerning (a) who is a self-directed learner?, (b) is SDLR stable across a life time?, (c) is SDLR associated with other measurable human attributes?, (d) can an individual's level of SDLR be changed through an intervention strategy?, (e) what are the characteristics of individuals associated with 'high' or 'low' SDLR, among others?

The SDLRS was based on a survey of abilities, attitudes, and personality characteristics related to self-directed learning (Guglielmino, 1977). It was designed to measure readiness for self-directed learning, to select suitable learners for self-directed learning programs, and to screen learners by identifying their strengths and weaknesses in self-direction in learning (Guglielmino, 1977). Others, looking for the origins of SDLR,

have conceived SDLR as primarily a personality trait that is developed through a combination of genetics and environment (Cloud, 1992; Stubblefield, 1992; Long, Redding, & Eisenman, 1993). Long (1993a) points out that the SDLRS does not inform investigators as to the origin of SDLR, but that research conducted with the instrument supports the notion that SDLR develops because of the interaction of genetic and environmental influences.

SDLR changes over time (Long, Redding, & Eisenman, 1993). An ongoing longitudinal study of 5th, 8th, and 11th-grade students has demonstrated that there is a significant group increase in SDLR between the 5th, 8th and 11th-grade (Long, Redding, & Eisenman, 1994). For some children, however, there was a dramatic increase in SDLR, and for others, an even more dramatic decrease in SDLR. The study, though rich in environmental qualitative data, does not adequately explain the individual changes in SDLR (Long, Redding, & Eisenman, 1993).

Nature of Self-Directed Learning

Self-directed learning has been conceptualized as a psychological construct, a pedagogical construct and as a sociological construct (Long, 1989a). As a psychological construct, self-directed learning is related to the cognitive domain. According to Long the psychological construct is the most critical because it is helpful in understanding elements of the other two. The sociological construct, which has been associated with independent learning, describes self-directed learning in terms of isolated and independent learners. This construct usually places learners within a prescribed curriculum that guides their independent learning. Examples of this kind of learning are correspondence courses and computer assisted instruction each of which typically occur in isolation. This view of self-directed learning does not address directly the psychological process or procedures by which the learner learns.

The construct that addresses the procedures of self-directed learning is the pedagogical model. Derived from Tough's (1967) early work on self-teaching, and informed by Knowles (1975), it describes a sequential process in which the learner sets goals, identifies resources, allocates effort and time to learning, and establishes the how and what kind of evaluation will occur for the learning outcome. The level of self-directedness is tied to the degree of freedom the learner has to control the procedures involved (Long, 1989a). Numerous individuals have studied self-directed learning in formal educational settings (Kasworm, 1983; Hiemstra, 1988; Smith, 1988) and others have sought to address self-directed learning in terms of learning theory (Danis & Tremblay, 1988) and the method of studying questions concerning self-directed learning (Spear, 1988; Long & Agyekum, 1983). The nature of self-directed learning is a well studied topic (Confessore, Long & Redding, 1993), however, the explanations for the origins of self-directed learning readiness continue to be elusive.

Origins, Development, and Maintenance

This part of the literature review is organized into three distinct domains of study. First, research material concerned with whether self-directed learning is a result of nature (genetic) or nurture (social) is discussed. Second, literature on self-directed learning grouped under the heading, Psychological Component of Self-Directed Learning, is considered. The third broad category of this part of the review considers research that generally falls under the heading social context.

Nature versus Nurture

A question that has been addressed to some degree by the researchers cited below has to do with whether self-directed learning is a result of nature, the genetic inheritance of the individual, or is influenced by the social environment. The answer does not appear to be a choice of one or the other, but rather, a matter of the degree to which nature and

nurture contribute to the development of self-directed readiness in an individual. This question is addressed more fully in the following sections.

Cloud (1992) studied the origin of self-directed learning readiness. Specifically, Cloud sought to determine the relationship between readiness for self-directed learning in elementary school students with their parents' readiness for self-directed learning. This author concluded that a significant association exists between the SDLRS scores of children and their parents. The findings indicate that there may be a genetic component to the formation of self-directed learning readiness, but also found support for the notion that it is somehow associated with intrafamilial social relationships.

Stubblefield (1992) also explored questions associated with the origin of self-directed learning readiness. Specifically Stubblefield sought to determine the association between childhood experiences and adult self-directed learning readiness. Using a sample of undergraduates and graduate students, a study was conducted based on quantitative and qualitative information. Using the SDLRS, Stubblefield segmented the respondents into quartiles and used the qualitative component of the study to identify the childhood experiences associated with the subjects in the lowest and the highest quarter of scores. Certain elements, such as unconditional love, motivation, responsibility, self-concept and sensitivity to the concept of control seemed to be limited to those scoring high on the SDLRS. The study found that intrafamilial relationships are important, but she was unable to fully explain the origins of self-directed learning readiness.

According to Guglielmino (1992) the most critical area of research in self-directed learning is the question of what contributes to an understanding of how the skills and attitudes involved in self-direction are developed. Guglielmino reported on the initial stage of multi-phase study designed to explore the origins of readiness for self-directed learning. This initial phase focused on the earliest potential influences and explored the possible familial relationships in the development of readiness for self-directed learning.

Specifically, it considered the possibility of sibling relationships in levels of readiness for self-directed learning. The study found no apparent sibling relationships in levels for self-directed learning, with the exception of twins within the same grade. However, no further data on other phases of the study have been reported by Guglielmino.

Kuhlen (1968) identified three major interrelated factors associated with "readiness for learning" (p. 39). The first two are levels of physical development and an appropriate psychological state. The third, subsumed under the heading "background experience," includes family experiences that "affect perception and motivations" (p. 39). Thus, readiness for learning is tied to the interrelated factors of physiological and psychological development in conjunction with the experiences learners encounter in their environment. Discussing studies associated with the notion of "cultural deprivation" and "culturally disadvantaged," Kuhlen demonstrates that an individual's environment can have an impact on successful learning.

Psychological Component of Self-Directed Learning

Literature concerning the psychological component of self-directed learning addresses how self-directed learning develops, and indicates to some degree the way in which learning is affected by environment. First, the importance of reviewing the literature on the psychology of self-directed learning is addressed, then links between the cognitive domain and the social domain are discussed; finally, the development of learning from a cognitive perspective is reviewed.

Long (1992b) indicates it is important to consider the discipline of psychology in order to understand self-directed learning. During a review of the literature on the nature of self-directed learning, Long (1989a) cited three critical dimensions, pedagogical, societal, and psychological. Of the three, Long considered the psychological aspects of self-directed learning to be the most important because it is the psychology of the individual self-directed learner that interacts within the other two dimensions.

The critical dimension in *self-directed* learning is not the sociological variable, nor is it the pedagogical factor. The main distinction is the psychological variable, which is the degree to which the learner, or the self, maintains active control of the learning process (Long, 1989a, p. 3). Therefore, it is important to consider the psychological dimension while studying the origins and maintenance of self-directed learning readiness.

Flavell (1963) associates the social construct of learning with the psychological domain. Flavell noted that the distinctive differences between pre-adulthood intellectual changes, as compared to cognitive changes in adults, are associated with biological-maturational factors. Pre-adult intellectual changes are associated with the inevitable growth of neurologically intact children (1970a); but, intellectual changes in adults are quite different according to Flavell. Intellectual change in adults occurs in the absence of biological growth factors and is associated with their experiences.

Flavell's (1963) description of biological-maturation factors is grounded in Piagetian cognitive development theory. This theory holds that cognition is an organized affair like digestion. Cognition is the adaptation of information, which includes assimilation and accommodation, and an intellectual response to one's environment. Piaget based his concept of psychological-development on the interaction between the individual and the environment; "every instruction from without presupposes a construction from within" (Flavell, 1970b, p. 406).

Piaget's (1952) learning theory may provide an explanation of how certain individuals become self-directed learners as they adapt to certain social environments. According to Piaget, organisms at each stage of life have a basic goal--to adapt to the environment. By adapt, Piaget means to function effectively in the world. Piaget explains the development of cognitive structures as an interaction between biological maturation and environment. Thus, it is during periods of physical maturation that cognitive development occurs in response to individual environments.

Social Context

To date the study of the social context of self-directed learning has been dominated by the micro-social paradigm. There are several research studies available in the literature, however, which also inform the study of self-directed learning from a macro-social point of view. Studies of both the micro and the macro environment will be reviewed in this section.

Micro-Social. This section summarizes pertinent literature concerned with the association between learners' immediate environment and their self-directed learning readiness. Literature associated with micro-social learning situations and their relationship to the origins, development and maintenance of self-directed learning are discussed.

Long, Redding and Eisenman (1993, 1994, 1995) have been involved with a longitudinal study of school age children and the development of self-directed learning readiness. Addressing the question ". . . does SDLR change across time in school?" to identify or provide an explanation for the change. The investigators found that it does change between the 5th and 8th grade and again between the 8th and 11th grade; and that generally there is an increase in self-directed learning readiness in students from the fifth to the eighth grade, and then from the 8th grade to the 11th grade. The investigators were unable to identify a reason for the change in individual scores. Therefore, the investigators consider the study to be nonconclusive in explaining why SDLRS scores increased (Long, Redding, & Eisenman, 1995).

Spear and Mocker (1984) address the mechanism that triggers or precedes the act of engaging in self-directed learning. They argue that it is the individual's response to the environment, based on life experiences that sets the stage for self-directed learning to occur. Spear and Mocker contend that self-directed learning occurs as a direct result of the organizing circumstance of the environment within which the learner is located. Therefore, self-directed learning occurs as a result of an organizing circumstance; but, they recognize

that each individual brings to those circumstances a wide range of experiences that tend to establish boundaries and limit the individual's perception of choice.

The notion of a "trigger" is also presented by Aslanian and Brickell (1980) as a way of describing the causes for adults to engage in learning (p. 36). While Aslanian and Brickell focused on adults, their rationale is useful in illuminating how certain situations or collective events in an individual's environment can trigger a response that results in a learning activity regardless of age. Thus an "event" can provide the trigger that releases the motivation to engage in a particular learning activity.

Cronbach (1968) provides an explanation as to the source of motivation for young learners involved in discovery learning. The learners were exploring mathematical concepts and ". . . creating brand-new mathematics, discovering a theorem not in any text" (p. 21). The association of discovery with the excitement of exploration built into the learning experience of Cronbach's students, "offered much the same reinforcement that the mathematician finds at the frontier of knowledge" (p. 21). Cronbach indicated that the self-directed learning experience (although the term was not used) contributed to the lifelong learning motivation of the students. Cronbach described it in these terms:

> This enforcement [sic] is thought to be an important element in arousing motivation for advanced study and a scholarly career, and in leading the average person to view quantitative reasoning as familiar and joyful rather than alien. (p. 22)

Cronbach indicates that a self-directed learner might experience an intrinsic form of pleasure that provides motivation and reinforcement for engaging in learning. In other words, the individual's learning success becomes the reward that motivates the self-directed learner to continue learning.

Flavell (1977) seems to be concerned with a similar form of motivation called *cognitive motivation*. Flavell describes it as the factors and forces that activate or intensify

human cognitive processes. This author associates motivation with the explanation for why learning occurs.

White (1968) extends motivational theory with an assembly of evidence that indicates the behavior of higher animals can be explained only by assigning a significant role to a drive for competence or mastery. According to White the satisfaction of this drive comes from being able to bend the environment to one's will, rather than from social approval or escape from discomfort. White identifies it as the impetus to learn, and also as an outcome of instruction. Cronbach (1968) notes little is known about the kind and amount of educational experience needed to maintain the child's initial alert interest in any aspect of knowledge.

Brill and Hayes' (1981) thesis for understanding change and adaptation posits the importance of society and environment in shaping the expenditure of human energy. One quotation from their text is especially interesting. ". . . the social character has the function of molding human energy for the purpose of the functioning of a given society " (p. 65). It is their contention that molding by 'social character' occurs without the awareness of the individual. That individual behavior is not always a reflection of conscious decisions "but that people want to act as they have to act and at the same time find gratification in acting according to the requirements of the culture (p. 65)."

Mezirow (1990) indicates that learning is tied closely to construing appropriate meaning from individual experiences. Mezirow considers understanding human experiences to be a basic need and associates it with adult learning. Importantly, this author ties the development of "meaning perspectives" to the childhood socialization process (p. 3). Mezirow states: "Transformative learning is not a private affair involving information processing; it is interactive and intersubjective from start to finish" (p. 364). While Mezirow's Perspective Transformation Learning is concerned with construing meaning from experience as a guide to action, it has been criticized (Clark & Wilson, 1991) for

failing to account for context. Specifically, Clark and Wilson were concerned that Mezirow failed to account for the historical context during which his study was conducted. Identifying Mezirow's problem as one of balance they point out that transformative learning pivots on the process of rendering meaningful experience, and that Mezirow places too much emphasize on individual agency at the expense of fully considering the social dimension.

The findings of a preliminary study of amateur radio operators (Redding, 1991; Redding & Aagaard, 1992) are consistent with the discussion above. Amateur radio operators, found to be self-directed learners, identified situations in their formative years that can be described as organizing circumstances that triggered their impetus to apply themselves to the task of learning new technology as a way to gain mastery over their environment, communicate, discover far away places, and be of service to their community. The fact that many, responding to how they came to have amateur radio as a hobby, could remember a specific instance, circumstance or event that left them with an abiding interest in amateur radio or related subjects may be of some significance. Typically, this event occurred during the pre-teen years. Massey (1979), too, mentions the importance of pre-teen years in the formulation of an individual's value system. Massey 's window, ages 8 to 12 years, appears to be the same window of time described by highly self-directed learners during which they encountered a triggering event (Redding, 1991). Redding described this event as "the first moment of lasting excitement" (Redding & Aagaard, symposium presentation, 1992b). Also, it closely corresponds with Piaget's 'concrete operations' stage (about 7-11 years of age) reported by Flavell (1963) as a period during which important cognitive structures are developed (p. 164).

Several authors converge on the importance of this formative period in shaping the individual to respond in a particular way to the environment. Piaget (1952) explains the development of cognitive structures as an interaction between biological maturation and

environment. The formation of these cognitive structures, as a result of experiences, seems to reflect Schooler's (1990) notion of being self-directed in order to adapt to a changing environment. The formation of these cognitive structures also reflects the attributes of Jarvis' (1986) concept of being a pro-active learner. One point that is not clear, however, is whether or not Massey's (1979) scheme of value formation is a factor in triggering lifelong learning for self-directed learners. Tentative support for such a position is suggested in Schooler's cultural anthropological studies, however.

Long, (1989a, 1991c) provides two models that address self-directed learning in a micro-social context. The first model describes a learner in a group situation that explicates the relationship between pedagogical control (the control exercised by the teacher) and the psychological control (the control exercised by the student) in a learning situation. The second model, which is actually five separate heuristic pathway models using the same variables, but with a different set of relationships among variables, places the learner in a social context and notes the possibility of the interaction among contextual circumstance, learner's personality, the larger society, and the individual's personal situation.

A recurring theme in Long's (1989a) work is the psychological control that the learner exerts in a variety of learning environments. It is this premise that permits Long to argue that self-directed learning is present to some degree in all learning situations. The range of learning situations that Long uses to illustrate his point ranges from the autonomous, for whom the parameters and learning activities are personally established, to the learner engaged in a formal group learning situation. In the formal learning situation the institution or teacher controls the learning situation, but Long points out that the individual may never fully release psychological control of the learning situation, and therefore continues to exercise some level of self-directed learning (control) in all learning situations.

Long (1989, 1991) developed a theory and illustrative model, applicable to the micro-social aspects of self-directed learning, that explicates the relationship between the

individual learner in a variety of group learning situations. The model uses a tetramorphic scale to illustrate the relationship between pedagogical control of the learning situation and the psychological control exercised by the individual learner as shown in Figure 1.

In Long's (1989a) illustration, self-directed learning is expressed in terms of the interaction between two dimensions. The first dimension is the amount of psychological control the learner has over the pedagogical process. The second, is the teacher's level of pedagogical control. The illustration demonstrates the differing degrees of pedagogical and psychological influence that exist in a micro-social learning situation. For example, in quadrate I the learner has high psychological control while the teacher exercises low pedagogical control. His theory suggests that under this set of micro-social conditions self-direction in learning would be high for those who have a high propensity for self-directed learning. The opposite micro-social condition exists in quadrate III. In quadrate III, as the teacher exercises high pedagogical control, the learner's opportunity to exercise psychological control is lower. Under these conditions Long's theory would suggest that self-direction in learning would be low.

From Long's (1989a) model inference can be drawn concerning the development and maintenance of self-directed learning (1989). Long suggests that quadrate I and III represent situations that may match a teacher's level of control. A highly self-directed learner, exercising high psychological control would find quadrate I satisfying, while a learner with low psychological control may prefer quadrate III. In both situations, learner satisfaction may be high and the individual learning preference reinforced. In quadrates II and IV the opposite is true and individual learning preferences may be frustrated, not reinforced, and the likelihood of the student dropping out increases, however. In all cases self-directed learning is most likely in quadrate I and II. For a highly self-directed learner, however, quadrate II would appear to be the worst kind of situation from a maintenance of self-directed learning perspective.

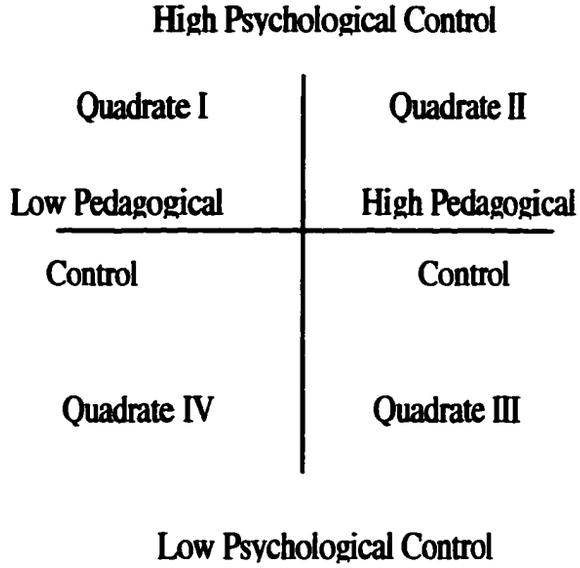


Figure 1. An Illustration of the Relationship Between Pedagogical and Psychological Control in Self-Directed Learning. From "Emerging Theory and Practice" by H. B. Long, 1989, *Self-Directed Learning: Emerging Theory and Practice*, p. 9. Copyright 1989 by the Oklahoma Research Center for Continuing Professional and Higher Education. Reprinted with permission.

The following heuristic model (Long, 1991c) depicts the way context, personality, social environment and situations can combine to increase the likelihood the self-directed learning will occur. It is the simplest of two models shown that illustrate the importance of various factors on the development of self-directed learning (see Figure 2).

Long's (1991) heuristic models each contain the same variables: (a) contextual, (b) situational, (c) social and (d) personality. Long suggests that these same variables may interact in various ways to result in self-directed learning. Another way of conceiving the relationships between the variables is shown below (see Figure 3).

While current literature does not indicate the path of the interaction between the categorical variables in Long's models, the models appear to explicate potential relationships in the components of the micro-social self-directed learning environment.

Macro-Social. Questions associated with what the literature has to say about the role of the self-directed learner's environment in the development of self-directed learning readiness are addressed in the following pages Four major authors' works will be explored. First, the research by Schooler (1990), that addresses the role of the macro-society (culture) in the origins and maintenance of "self-directedness" is discussed. Second, the writing of Massey (1979), who addresses the role value formation plays during early stages of an individual's life in determining adult values, is reviewed. Third, Jarvis' (1985, 1986, 1990) work is reviewed in terms of his research and writings concerning the influence of society on individual self-directed learning readiness. Finally, Long's (1989b, 1990b) work in biographical essays concerning Penfield and Peter the Great will be reviewed as a way to provide a historical macro-social perspective.

Schooler (1990), a cultural anthropologist, has written on the role of the macro-society (culture) in establishing conditions in which members of a society are inclined to be self-directed. In equating self-directedness with individualism, Schooler provides support for reasoning that individualism is associated with the macro-social context by tying a

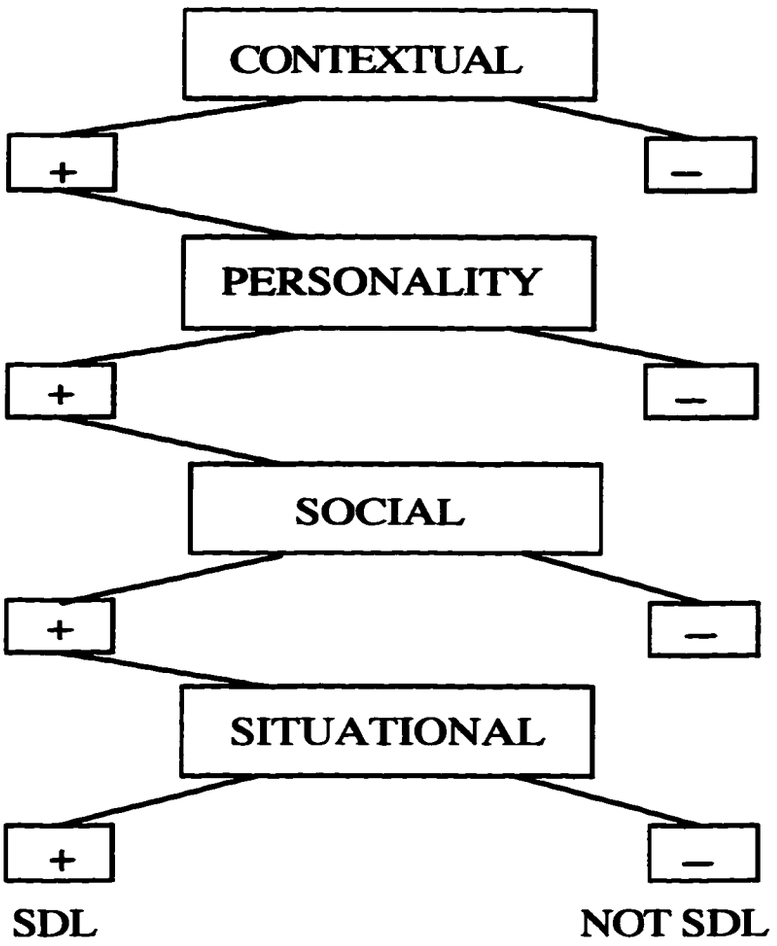


Figure 2. The Contextual Model for Analysis of Interacting Variable Categories in Self-Directed Learning. From "Challenges in the Study and Practice of Self-Directed Learning" by H. B. Long, 1991, *Self-Directed Learning: Consensus and Conflict*, p. 23. Copyright 1991 by the Oklahoma Research Center for Continuing Professional and Higher Education of the University of Oklahoma. Reprinted with permission.

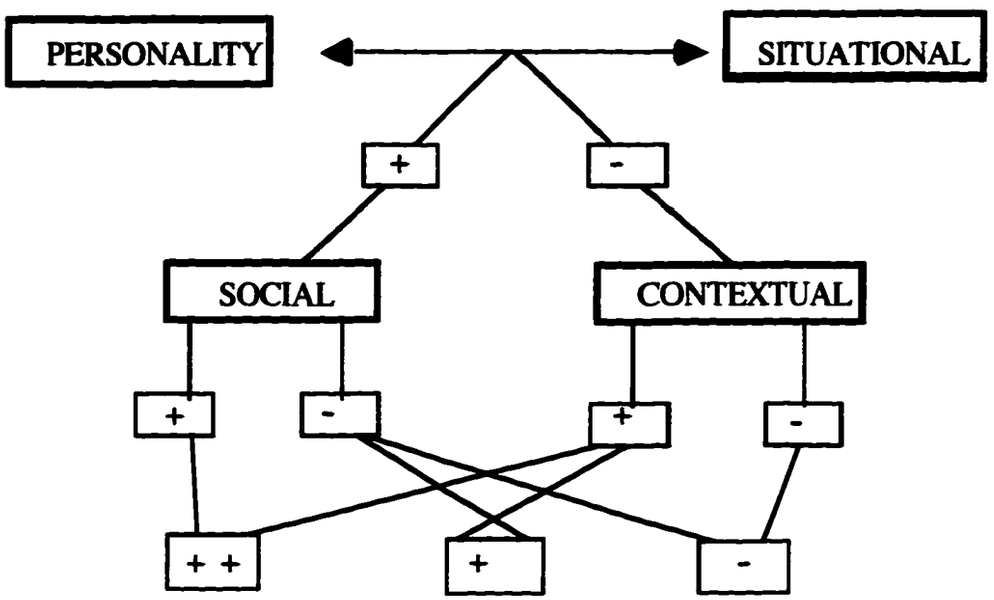


Figure 3. "An Interaction Model for Analysis of Interacting Variables of Categories in Self-Directed Learning" From "Challenges in the Study and Practice of Self-Directed Learning" by H. B. Long, 1991, *Self-Directed Learning: Consensus and Conflict*, p. 24. Copyright 1991 by the Oklahoma Research Center for Continuing Professional and Higher Education of the University of Oklahoma. Reprinted with permission.

society's valuing of self-directedness to the society's success at adapting to change. Whether individualism is, or is not, the *sine qua non* of self-directed learning readiness, it is possible to associate the two. Using three different cultures to illustrate her points Schooler argues that not only is self-directedness a characteristic of the three cultures, but more importantly, stresses that it is the macro-society's valuing of the individual's self-directedness that encourages the development of the trait within members of the society. Schooler argues that the macro-society can effect self-directedness of its individual members and that it is the individual member's self-directedness that permits the society to successfully adapt to a changing environment.

In Schooler's (1990) theory, self-directedness is viewed as a cultural adaptive mechanism that permits a society to respond to change. Successful societies adapt most readily. These conclusions are based on cultural anthropological work with prehistoric cultures, 13th to 19th century England, 16th century Japan, and modern industrialized societies. The author notes that self-directed behavior occurs in response to complex changing environments. Rapid cultural changes occur and demand increased individualism. In the case of England, individualism led to technological change and development. Schooler provides no clear explanation of the cause for the relationship between individualism and the degree to which it is prized within a culture. Therefore, there is no ultimate answer about why such effects occur. However, the author concludes that modern industrialized nations must embrace self-directedness in order to be successful.

Massey (1979) associates value formation with the major formative events that occur within a macro-society during an individual's critical formative period between ages 8 to 12 years of age. Massey's period of ages 8 to 12 years closely parallels Piaget's 'concrete operations' stage (about 7-11 years of age) reported by Flavell (1963) as "a period during which important cognitive structures are achieved" (p. 164)." It is Massey's

contention that this value formation directly influences the choices that adults make, including providing the motivation to learn.

Massey's (1979) theory of value formation also addresses the critical period of human development by classifying people according to separate decades; accordingly he proposes that values are formed, to a large degree, based on what is occurring in a society during an individual's formative years. According to Massey, value formation may be a useful construct to explain why some individuals, from a given decade, are more highly self-directed than others. Individual value formation can explain why attitudes associated with "work ethic,""independence," and "hard work" seem to vary from generation to generation (p. 9). Each of these attitudes, according to Massey, is a reflection of "who you were when" (p. 51). In other words, the historical events of a given decade affect the kind of values an individual forms, and these values become fixed and are part of "who" the individuals are, for the rest of their lives.

The following three authors provide support for Massey's (1979) notions concerning the importance of value formation within the macro-social environment. Bandura (1986) identifies an individual's past environment as one of two causes for current behavior. Interestingly, Bandura places emphasis on "past environmental inputs" and identifies it as a "truism" (p. 16) that peoples' actions are affected by their past experiences. Jarvis (1992) examines how certain attributes of a society, such as freedom to choose, can influence the self-directedness of a society's members. Importantly Jarvis explores the impact individual "biographies" have on the choices the individual makes later in life. Jarvis' position seems to be supportive of Massey's theory concerning value formation. Candy (1991) and Jarvis (1985, 1986) tie in Schooler's (1990) concept concerning individualism and self-directedness indirectly without reference to her work. The connection is made through their association of the concept of self-directed learning with

the value of independence and individualism in American culture. These authors indicate this may explain why self-directed learning is associated uniquely with being American.

Candy (1991) observed "In the past , self-direction was seen essentially as a personal quality or attribute.."(p. 246). Even though Candy provides no evidence, he asserts that learning was viewed as a process of acquiring attitudes, skills, and knowledge from outside the self; and individuals were seen as substantially asocial atoms, independent of their social and cultural environments. Candy believes this view is changing. Self-direction is now, according to Candy, acknowledged as a product of the interaction between the person and the environment; knowledge is recognized as tentative, evanescent, and socially constructed; learning is defined as a qualitative shift in how phenomena are viewed; and individuals are seen in a complex and mutually interdependent relationship with their environments. Thus, according to Candy, our understanding of the concept, self-directed learning, is emerging as it moves from a concept associated principally with individual development to one that includes the impact of social and cultural environments.

Long (1989b, 1990b) approached questions concerning the origins of self-directed learning from a historical (micro and macro-social) perspective by studying the biographies of Wilder Penfield and Peter the Great. Long found the most significant relationships in the micro-social relationships. Penfield was a pioneer neurosurgeon who, like Peter the Great, demonstrated a life time of self-directed learning. Peter the Great was a self-educated man, recognized as expert in several diverse fields. Both Penfield and Peter the Great demonstrate the development of self-directed learning within the context of rapidly changing and dynamic societies. The study of their biographies contain both micro and macro social insights, and thus informs both areas. Long concluded that the freedom available to an individual in early childhood (micro-social) was predominant over the influence of the larger social environment (macro-social). Long also concluded that biographies can provide a stimulating source of material for the study of self-directed

learning. Further, Long's biographical research, informs the methodology of research by indicating the value of biography in the study of self-directed learning.

Research Methods Used to Study Self-Directed Learning

This section reviews research associated with self-directed learning. Specifically research design, methodology, and instrumentation are discussed.

Design and Methodology

Confessore, Long, and Redding (1993) report that of 556 items associated with self-directed learning, 363 were research items. Several researchers have been critical, to one degree or another, of self-directed learning research (Brookfield, 1984; Candy, 1991; Caffarella, 1988). The criticisms include being based on one research method, quantitative analysis; one instrument, the SDLRS; one kind of sample, white middle class; ignored the social context by focusing on isolated learners; and finally, placed insufficient emphasis on the social and political implications (Brookfield, 1984). Long (1994) challenges Brookfield's description on several points.

Confessore, Long and Redding (1993) further report that rather than self-directed learning research relying on just one research design (quantitative) it is closer to being evenly split between quantitative and qualitative. Research was considered quantitative if the "following elements were present: hypotheses, statistical treatment of data, and instruments that produced quantitative information" (p. 52). Qualitative research, lacking the previously listed elements, included biographical analysis, case studies, historical works, interpretative literature reviews, theoretical and philosophical explications as well as ethnographic, phenomenological and other naturalistic research" methods (p. 52). The use of qualitative methods is increasing and quantitative research remains devoted to description. Confessore, Long and Redding speculate that self-directed learning theory development is likely to remain weak until qualitative research yields theory that can be

tested, and until researchers supplement the qualitative findings with studies of cause and effect.

Instrumentation

Over 135 different instruments have been used in conjunction with self-directed learning research as identified during the comprehensive review of 556 self-directed learning publications (Confessore and Long, 1992; Confessore, Long, and Redding, 1993; Long and Redding, 1991). Of the 135 instruments, eight were identified by the authors as being designed to measure some aspect of self-directed learning.

The most frequently used instrument has been Guglielmino's (1977) Self-Directed Learning Readiness Scale (SDLRS). This instrument, or a variation of it, is associated with a number of research studies designed to answer developmental questions about self-directed learning (SDL) and self-directed learning readiness (SDLR) to include (a) the origins of SDLR (Guglielmino; Long, Redding and Eisenman, 1993, (b) the association of SDLR with other variables (Adenuga, 1991; Brockett, 1985a; Cloud, 1992; Eisenman, 1988; Finestone, 1984; Long, Redding & Eisenman, 1993; Stubblefield, 1992), (c) the conceptual definition of self-directed learning (Brookfield, 1985, 1986; Long, 1991), and (d) the evolvement and development of self-directed learning readiness through the study of childhood development (Cloud, 1992; Guglielmino, 1992; Long, Redding and Eisenman, 1992, 1993, 1994; Stubblefield, 1992).

Self-Directed Learning Readiness Scale

Drawing on the work of Tough's (1967) and Knowles' (1970, 1975) interest in self-direction, Guglielmino developed the Self-Directed Learning Readiness Scale (SDLRS) using a Delphi study, incorporating input from 14 experts in the field of adult education.

The SDLRS, in its original form, is a 58 item self-report survey that uses a Likert scale and was designed to specifically measure the construct, "Self-Directed Learning Readiness" (Finestone, 1984, p. ii). Factor analysis of the original instrument indicates the

presence of eight factors in self-direction in learning: openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, love of learning, creativity, future orientation, and ability to use basic study skills and problem solving skills (Guglielmino, 1977).

Guglielmino (1977) developed the instrument using a Delphi technique. Part of the instructions given to the committee included these phrases:

> . . . it is the personal characteristics of the learner - including his attitudes, his values, and his abilities - which ultimately determine whether self-directed learning will take place in a given learning situation. The self-directed learner more often chooses or influences the learning objectives, activities, resources, priorities, and levels of energy expenditure than does the other-directed learner. (p. 34)

The previous description represents the theoretical constructs for the SDLRS. As there is an inherent gap between theory and research, e.g., the two are never precisely the same (Blalock, 1964), it is therefore important to know if the SDLRS reflects its theoretical constructs.

Guglielmino (1977) provides a description, derived from her study, of those that score high on the SDLRS. As such, the SDLRS provides an operational construct of an individual who is high in self-directed learning readiness. A highly self-directed learner, based on the survey results, is one who exhibits initiative, independence, persistence in learning; one who accepts responsibility for his or her own learning and views problems as challenges, not obstacles; one who is capable of self-discipline and has a high degree of curiosity; one who has a strong desire to learn or change and is self-confident; one who is able to use basic study skills, organize his or her time, and set an appropriate pace of learning, and to develop a plan for completing work; one who enjoys learning and has a tendency to be goal-oriented (p. 73).

The above description appears to be promising concerning the potential for using the SDLRS to identify learners who respond well to change in the environment.

Confessore, Long and Redding (1993) report that the overwhelming instrument of choice by those conducting research in the area of SDL is the SDLRS. Principally, these efforts focused on the attributes of a self-directed learner. Confessore and Long (Long & Confessore, 1992) report on 383 non-dissertation publications, published between 1966 and 1991. Their analysis revealed that 253 of 383 items published on self-directed learning, addressed childhood learning or adult learning characteristics.

The self-directed learner has been described as goal oriented, flexible, inquisitive, learning oriented, adaptable, and capable of managing the selection, planning, implementation and evaluation of individual learning projects (Long, 1987; Redding, 1991). Two studies have addressed the implications associated with the SDLRS scores achieved by amateur radio operators (Redding, 1991; Redding & Aagaard, 1992). Validity and reliability of the SDLRS have been repeatedly checked (Jones, 1989; West & Bentley, 1991; Confessore, 1992; McCune & Guglielmino, 1991; Finestone, 1984; Long & Agyekum, 1983). The original form of the SDLRS had an internal consistency of .87 for the total 41 item scale as does the 58 item version (West & Bentley, 1991). Researchers, since the development of the SDLRS, have determined that the construct validity of the "total SDLRS score is positively related to measures of originality, creative experiences and achievements, and right hemispheric style of learning" (West & Bentley, 1991, p. 159).

Summary of the Literature Review

This literature review was divided into the three major topical areas of the nature of SDLR, the nature of SDL, and SDL origins and maintenance. Guglielmino (1977) made SDLR a central issue to the nature of SDL with her development of the SDLRS. Using the SDLRS investigators have been able to examine and explore SDLR and consider its development.

Several investigators (Cloud, 1992; Eisenman, 1988; Long, Redding & Eisenman, 1993; Stubblefield, 1992) were concerned with the development of SDLR. They addressed questions concerning the contribution school environments, intrafamilial relationships and genetics have on the development of SDLR. However, their investigations have not fully explained the development of SDL.

Cloud (1992) found reason to believe that there may be a genetic component to the development of SDLR. Stubblefield (1992) found intrafamilial relationships to be important to the development of SDLR. Long, Redding and Eisenman (1992, 1993, 1994), investigated the change in SDLR over time. These investigators found that SDLR changes over time, and identified support for the notion that certain types of isolated activities are associated with an increase in SDLR.

Two models (Long, 1989a, 1991c) illustrate the relationship between the learner and social environments. The first model depicted the learner in a group learning situation and can be used to discuss the trade-off between the individual's psychological control and the teacher's level of pedagogical control and the second, consisting of a series of models, places the learner in a larger social context. Using pluses and minuses to describe the cumulative effect different path experiences can have on the learner, Long's model is useful in describing ways life situations can result in self-directed learning.

Literature concerning the development of SDLR in the social context was also reviewed. It has been noted that the micro-social view of SDLR has dominated its study. The studies by Long, Redding and Eisenman summarized above fall into the micro-social study of SDL. Others (Spear and Mocker, 1984; Aslanian and Brickell, 1980) point out that a single event can trigger or release the motivation to engage in learning. Cronbach (1986) introduces the notion that successful learning can provide the motivation to continue to choose to learn. Both the contribution of the individual environment and genetic background have been addressed to one degree or another. No studies, to date, have

addressed the development of self-directed learning from the larger cultural perspective. Schooler (1990), however, suggests that self-directedness varies from society to society and that it may be a significant factor in a culture's ultimate success and even its survival. According to Schooler's theory, self-directedness is an adaptive behavior and the macro-society can effect the self-directedness of individual society members based on the value the society places on individualism.

Supporting Schooler (1990), Bandura (1986), and Rodin (1990) have suggested adult behavior and attitudes are influenced by the major social events they encounter. Such events, indicated by Massey (1979), include the Great Depression, major wars, and so forth. If self-directed learning is an adaptive phenomenon associated with the learners' environment, it is reasonable to assume that it may be associated with periods of rapid cultural change.

Massey (1979) contends that value formation, which occurs between ages eight and twelve years, directly influences the choices that adults make, as well as their motivation to learn. If Massey's theory is useful it may explain to some degree the societal mechanism that encourages the development of the self-directedness as discussed by Schooler (1990).

A key element of Massey 's (1979) theory is that the values held by adults are formed during a particular period of time, during their youth. This time, during which values are formed, appears to be comparable to the time described by some highly self-directed learners during which they encountered a triggering event (Redding, 1991).

Piaget's (1952) stages of development theory also lends support to Massey's (1979) notion of a critical period of development when values are formed with his concept of adaptation as an explanation for cognitive development. They seem to reflect Schooler's (1990) notion of being self-directed in order to adapt to a changing environment and also reflect attributes of Jarvis' (1986) concept of being proactive learners. The authors just cited also contribute, to a minor degree, an explanation as to why some respondents in

Redding's 1990 study (Redding, 1990; and Redding and Aargaard, 1991) of amateur radio operators reported incidents early in life that led them to a life time interest in radio communications, technology, and information exchange.

CHAPTER III

Research Design and Methodology

Conceptual Framework

The concept of self-directed learning (SDL) is not unexplored, Tough (1967) approached it from the related area of learning projects, and Knowles (1975) associated it with adult learning in a group setting. Self-directed learning has been conceptualized in various ways by Brockett (1985; Brockett & Hiemstra, 1991), Brookfield (1984, 1988), Long (1987, 1989a), and Jarvis (1990). The construct of self-directed learning readiness (SDLR) has been operationalized with the development of the Guglielmino (1977) Self-Directed Learning Readiness Scale (SDLRS).

The origins of self-directed learning readiness primarily have been associated with micro-environments with various investigators seeking to determine how SDL develops. The importance of school and familial environs have been explored (Cloud, 1992; Eisenman, 1988; Long, Redding & Eisenman, 1992, 1993, 1994; Stubblefield, 1992). Yet, important questions remain to be answered.

Research suggests that the development of SDL may have a macro-social component. Massey (1979) suggests that values formed and locked in as a result of childhood experiences may provide the motivation to be a life-long SDL. Schooler (1990) calls attention to the notion that self-directedness is an adaptive behavior associated with cultures that respond successfully to change. The most successful cultures are those that value individualism, according to Schooler (1990), Jarvis (1986), Candy (1991), and Clark and Wilson (1991) who each associate the concept of self-directedness with individualism and American culture.

Based on an exploratory pilot study of highly self-directed learners (American amateur radio operators), Redding (1991) observed that many of the respondents reported similar experiences that led to a life time of SDL. These experiences appeared to have a

common component of being associated with technical or social changes that effect the larger macro-society. Therefore, this study is designed to explore the relationship between the development of individual self-directed learning readiness and events in the larger macro-society, following Massey (1979) by collecting demographic and biographical information from a group of amateur radio operators' questionnaire responses and an associated SDLRS instrument.

Assumptions

This research was based on the following assumptions:

1. Amateur radio operator responses to the questionnaire and SDLRS were candid and truthful.

2. Holding an Amateur Radio Operator's license is evidence of self-directed learning.

3. The SDLRS is a valid and reliable measure of self-directed learning readiness.

4. The macro-social developmental component can be observed and classified.

Limitations

Limitations that may affect the interpretation of the results are listed below:

1. The results may not be generalizable beyond the study.

2. Macro-social components may mask the impact of the meso and micro-social aspects of self-directed learning development and vice-versa.

Procedures

A multi-step process was followed to identify whether historical events affect self-directed learning readiness. This research used material developed and used in the pilot study (Redding, 1990), and extends that study to address the central research question.

Step 1: A one page demographic questionnaire was used to collect the following information: (a) demographic variables (age, sex, race), (b) educational level in number of years completed, (c) information associated with their amateur radio license (class of

license and date awarded), (d) study habits, (e) reason for becoming a ham, (f) level of family support for the hobbies, (g) other family members licensed, (h) location of the station, (I) other hobbies, and (j) occupational information. In addition to the questionnaire each respondent completed a SDLRS-A instrument. Those who scored below the first quartile point and beyond the third quartile point were contacted for a follow-up interview.

Step 2: A quantitative analysis of SDLRS-A was completed to identify individual Self-Directed Learning Readiness Scale scores.

Step 3: Twenty respondents each, who scored within the first and fourth quartile were selected for follow-up interviews. An open ended question was used to determine if the respondents selected had a single identifiable experience in their youth which influenced their ultimate entry into the amateur radio hobby.

Step 4: The Federal Communications Commission Amateur Radio Licensee data base was queried to determine the number of amateur radio operators licensed by birth year. From this information a histogram of licensees by birth year was constructed.

Step 5: A comparison of the national amateur radio population by birth year was constructed and compared against a normal distribution to determine if an abnormally high or low number of amateur radio operators entered the hobby from any particular period of time. Birth years producing higher or lower than expected numbers of amateur radio operators were identified.

Step 6: Major conspicuous events in American history that correlate with abnormally high or low numbers of new amateur radio operators by birth year were identified.

Step 7: Responses collected in Step 3 were compared to the data developed in Step 6 to identify correlations and patterns.

Subjects

Amateur radio operators of the United States were the subjects for this study. The sample was collected from on-the-air contacts, amateur radio clubs, and participants in amateur radio activities. This sampling method, while a sample of opportunity, ensured that all participants in the study were individuals who were active amateur radio operators.

Instrumentation

The Guglielmino Self-Directed Learning Readiness Scale (SDLRS), which has been previously validated (Finestone, 1984; Guglielmino, 1977, 1992; McCune & Guglielmino, 1991) was administered to selected subjects. At the time the subjects complete the SDLRS, they also responded to a questionnaire that obtained information about their age, educational level, progress through amateur license structure, study and learning habits, reason for becoming a ham, family support of their hobby activities, amateur radio activities, other hobbies, and careers.

Research Questions

Eleven research questions, as listed below, were addressed:

1. What kind of an association exists between SDLRS and being an amateur radio operator?

2. What kind of an association exists between SDLRS and sex?

3. What kind of an association exists between SDLRS and age?

4. What kind of an association exists between SDLRS and educational level?

5. What kind of an association exists between SDLRS and class of amateur radio license?

6. What kind of an association exists between SDLRS and one's self assessment of whether one prefers to study alone or in a group?

7. What kind of an association exists between SDLRS and one's self assessment of whether one is a self-directed learner?

8. What kind of an association exists between SDLRS and the number of amateur radio operators in a family?

9. What kind of an association exists between SDLRS and number of hobbies ?

10. What kind of an association exists between SDLRS and the occupation?

11. What kind of an association exists between historical events and the development of SDLR?

Statistical Treatment

Descriptive statistical analysis was used to examine the group. Effect size was computed to compare amateur radio operator SDLRS scores with the general population. Correlations were computed to explore the association between SDLRS scores and other variables. Histograms with a normal distribution were prepared to inspect conspicuous periods during which higher or lower than expected numbers of amateur operators were born. The respondents were organized and segmented using the first and fourth quartile. Qualitative analysis was used to gather responses from amateur radio operators in the first and fourth quartile concerning events which may have influenced their participation in Amateur Radio Service. The x2 and regression statistics were used to analyze the scores of individuals within these groups. This permitted the comparison of low score (before the first quartile) and high score (within the fourth quartile) respondents. Low and High score respondents were matched by birth year to conspicuous events that occurred during the periods when they were eight to twelve years of age.

Responses were analyzed by the following statistical procedures: Effect Size, ANOVA, correlation coefficients, mean, median, mode, standard deviation, range, standard error, skewness, and number of valid and missing observations.

CHAPTER IV

Quantitative Analysis

Eleven questions concerning the possible origins of self-directed readiness as defined by scores on the Guglielmino (1977) Self-Directed Learning Readiness Scale (SDLRS) are addressed by this research. This chapter presents findings concerning the association of individual SDLRS scores and age, educational level, being an amateur radio operator, class of amateur radio operator license held, self-assessment of whether the respondent is a self-directed learner, number of amateur radio operators in a family, number of hobbies, and occupation. Chapter V will present additional qualitative findings based on structured interviews of selected respondents.

The findings in this chapter are reported in three sections. First, the descriptive data for the total sample are presented, Second, findings concerning the eleven research questions are reported. Third, a discussion of the findings concludes the chapter.

General Descriptive Statistics

The research design, as described in Chapter III, was based on a multi-step process. First, the eleven research questions were addressed through the collection of demographic information and the completion of the Guglielmino (1977) Self-Directed Learning Readiness Scale. Second, additional qualitative information associated with the phenomenon was collected through interviews. Respondents who scored below the first quartile and beyond the third quartile, were selected for the interviews. The analyses of the interviews are reported in Chapter VI.

Descriptive statistics were used to organize, and aid in the analysis of the data collected. Where helpful, the results of descriptive statistics are displayed in graphical form. Correlations were used to analyze the association between individual SDLRS scores and other demographic and self-reported data. Computer software (B/STAT, Motorola 68000) was used for computation.

The following general descriptive data providing an overall view of the sample are displayed in Tables 4.1 and 4.2.

All 13 variables are included in Table 4.1. Two variables, age and SDLRS are continuous. Other variables, such as educational level, class of license, and other hobbies, are identified in ranges. Still other variables, study habits, whether self-reported as self or other-directed, level of family support, station location, and occupation, are more subjective and categorical in nature.

Figure 4 is a histogram of the national population of US amateur radio operators with a normal distribution curve overlaid. The histogram provides a graphical portrayal of the distribution of amateur radio operators by age. The base year is 1997. Given a total population of nearly 500,000, one would expect the distribution to be normal. The growth in the population appears depressed during the period 1925 through 1940, however. If amateur radio operators are high in SDLR, then any variance in the distribution of amateur radio operators may be an indication of a variance in the general distribution of individuals high in SDLR or may be explained by other unidentified variables such as costs associated with the hobby and income levels.

Figure 5 is a graphic that shows the percentage of live births that are amateur radio operators in the current population. The graphic indicates that the variance in the number of hams by birth year corresponds to some degree with the number of live births.

Table 4.1

Descriptive Data for the Total Sample of 262 Amateur Radio Operators by Demographic Variables as a Function of Standard Deviation.

Variable	n	Mean	Standard Deviation	Minimum	Maximum
Age	261	48.9	16.46	11	85
Educational level	260	15.1	2.95	5	19
Sex	261			26 (F)	236 (M)
Race	256			5 (O)*	251 (W)
License class	260	4.5	1.40	1	7
Study habit	220			1	2
Self-directed	213			1	2
Why amateur	246	3.0	0.63	1	6
Family support	257	3.0	0.92	1	5
Station location	250	4.0	0.80	1	5
Other hobbies	255	2.4	1.31	0	8
Occupation	249	2.9	0.92	1	5
SDLRS score	262	238.0	24.51	166	285

* Other

Table 4.2

Descriptive Data for the Total Sample of 262 Amateur Radio Operators by Demographic Variables as a Function of Frequency of Response.

Variable	Frequency	Percentage
Sex		
Male	236	89.0
Female	26	11.0
License class		
Novice	8	3.1
No-Code Technician	5	1.9
Technician Plus	66	25.8
General	29	11.2
Advanced	66	25.4
Extra	80	30.8
Study habits		
No response	41	15.7
Individual	203	77.8
Group	17	6.5
Self-direction		
No response	48	18.5
Self	196	75.3
Other	16	6.2
Ethnic Group		
American Indian	2	0.8
Asian	0	
Black	1	0.4
Hispanic	0	

(table continues)

Variable	Frequency	Percentage
Pacific Islander	2	0.8
White	251	98.0
Other	0	
Number of family members licensed		
1	151	58.8
2	68	26.5
3	27	10.5
4 or more	11	4.3
Why amateur radio operator		
No response	16	6.2
Compelled by other	4	1.5
For other	32	12.4
Goal/to be able to	174	67.2
Fun/challenge	30	11.6
To know/fascination	2	0.8
Love of learning	1	0.4
Level of family support		
Against	0	0.0
Not supportive	16	6.3
Somewhat	52	20.6
Supportive	93	36.8
Very	92	36.4
Station location		
No Answer	14	5.4
Separate	15	5.8
Garage	13	5.0

(table continues)

Variable	Frequency	Percentage
Spare Room	166	63.4
Family Area	52	20.0
Other hobbies		
No response	7	2.7
None	1	0.4
One	73	27.9
Two	70	26.7
Three	64	24.4
Four	30	11.5
Five or more	17	6.5
Occupation		
No response	13	5.0
Laborer	23	8.8
Non-professional	43	16.4
Semi-professional	111	42.4
Professional	70	26.7
Researcher	2	0.8

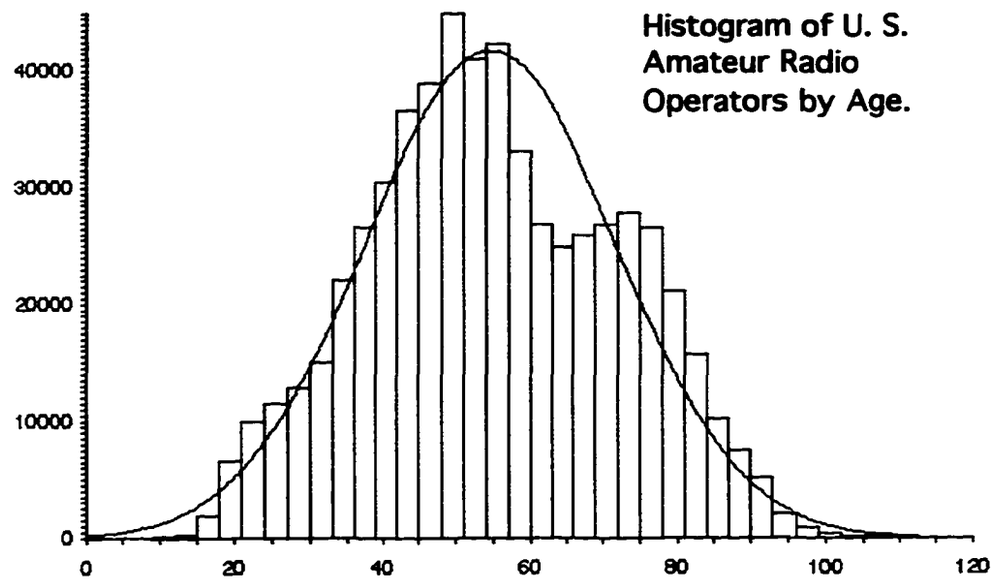


Figure 4. Histogram of US Amateur Radio Operators by age. Developed from the data contained in the HamCall, U. S. Data base (Buckmaster, 1993).

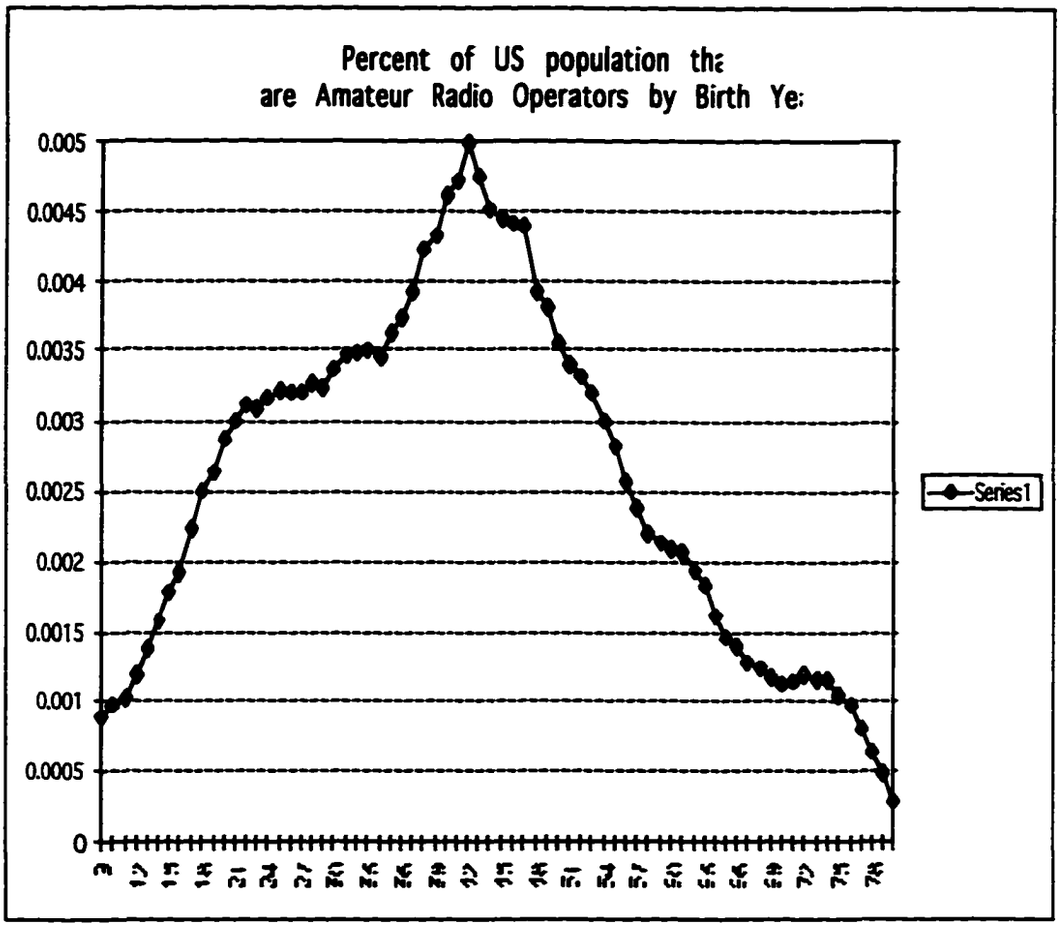


Figure 5. This graphic displays the percentage of individuals, by birth year, that are licensed US Amateur Radio Operators as compared to the number of live births that occurred in the US. The graphic is derived from HamCall (1993) and Datapedia of the United States 1790-2000 (Kurian, 1996).

The mean age of the respondents was 48.9; the range of ages was from 11 to 85 and falls within the age ranges of previous studies of SDLRS (McCune and Garcia, 1989). The mean educational level was 15.1 years; the range was 5 to 19+ years of education. The respondents were predominantly male; 240 of 261, and white; 251 of 256.

The SDLRS scores ranged from 166 to 285 with a mean of 238.0 and a standard deviation of 24.51.

A series of questions designed to gather information about the respondents' interest in amateur radio were presented. The range of license class is from Novice to Extra. The majority of respondents were General class or higher; 175 of 262 (see table 4.2). Table 4.3 indicates the type of effort required to acquire each level of amateur radio license.

Each written examination must be taken in sequence. That is to say, one must pass the Novice written exam before attempting the Technician written exam. The same is not true for the demonstrating Morse Code proficiency. One could attempt the 13 words per minute Morse Code test first. Learning Morse Code is considered a difficult barrier to overcome in order to become an amateur radio operator, even at the 5 words per minute entry level. It is interesting to note that the distribution of No-code Technician licensees within this self-selected sample, only 2% (Table 4.2), is markedly different from the national distribution of 33% (NACB, 1997).

Table 4.3

Class of Amateur Radio License and Difficulty

Class of license	Number of questions per exam	Code speed for exam	Theory and examined regulations
Novice	25	5 wpm	Basic theory and regulations
Technician -	20	not required	Basic theory and regulations plus additional theory and regulations
Technician +	20	5 wpm	Additional theory and regulations
General	20	13 wpm	Detailed theory and regulations
Advanced	45	13 wpm	Advanced theory and regulations
Extra	50	20 wpm	Additional theory and regulations

Note: Each class of license has an associated written exam. Each written exam must be passed in sequence for the amateur to advance. Qualifying at a higher code speed negates the requirement to pass slower speed code exams.

Respondents were asked to self-report on whether they preferred to study alone or in a group, were self-directed or other directed, and why they became amateur radio operators. An indication of their micro-social environment, as it pertained to their amateur radio activities was also explored through questions associated with level of family support and station location.

Findings Concerning Research Questions

The responses from the subjects were treated statistically to identify associations with SDLRS scores. In each case the correlation coefficient between the two variables and the probability that the actual correlation is zero is presented.

What kind of an association exists between SDLRS and being an amateur radio operator? The mean SDLRS score for the sample is 238 with an SD of 24.41. Guglielmino reports, in the instructions for interpreting SDLRS scores, that the average

score for adults is 214 and the SD 25.59. Comparison of the population means relative to the population standard deviation provides a useful frame of reference for claiming there is a difference between populations (Minium and Clark, 1982). If there is an association between being an amateur radio operator and SDLRS we would expect the effect size to indicate a difference between the average SDLRS for adults and the mean of our sample. An effect sizes larger than .33 should be considered to have practical significance (Borg & Gall, 1989). The effect size is 0.94 indicating there is a significant difference between Guglielmino's mean of 214 and the mean SDLRS score of 238 for the amateur radio operators included in this study.

What kind of an association exists between SDLR and sex? The point biserial correlation is a special case of Pearson product-moment correlation. It is designed for the situation where one variable is continuous and the other dichotomous (Wilson, 1992). It shows the extent of a relationship exists (Hay, 1988). The test value is 0.0952, with 258 degrees of freedom, and a two tail probability of more extreme value of 12.6%. This probability of more extreme values exceeds an exploratory alpha level of .1. Therefore, the notion that there is an association between SDLRS and sex is rejected.

What kind of an association exists between SDLRS and age? The test value is -0.0064, and a two tail probability of more extreme value of 91.82%. Therefore, there is no apparent association between SDLRS and age.

What kind of an association exists between SDLRS and educational level? The test value is 0.2276, and a two tail probability of more extreme value of 0.02%. Therefore, there is a positive association between SDLRS and educational level in the amateur radio operator sample.

What kind of an association exists between SDLRS and class of amateur radio license? The response was scored with a zero for no license to a seven for an Extra class license. The test value is 0.0761, and a two tail probability of more extreme value of

22.5%. Therefore, there is no apparent association between SDLRS and class of amateur radio license.

What kind of an association exists between SDLRS and one's self-assessment of whether one prefers to study alone or in a group? The responses were coded either 0 for alone, or 1 for group. The test value is -0.2561, with 218 degrees of freedom, and a two tail probability of more extreme value of 0.01%. Therefore, there is a negative association between SDLRS and whether an amateur radio operator prefers to study alone or in a group. In other words, those that prefer to study in a group tend to have lower SDLRS scores.

What kind of an association exists between SDLRS and one's self-assessment of whether one is a self-directed learner? The responses were coded either 0 for self-directed, or 1 for other-directed. The test value is -0.1124, with 211 degrees of freedom, and a two tail probability of more extreme value of 10.19%. Therefore, the notion that there is an association between SDLRS and an amateur radio operator's self-assessment of being a self-directed learner is rejected.

What kind of an association exists between SDLRS and the number of amateur radio operators in a family? The test value is 0.0578, and a two tail probability of more extreme value of 35.20%. Therefore, there does not appear to be an association between SDLRS and the number of amateur radio operators in a family.

What kind of an association exists between SDLRS and number of hobbies? The test value is 0.2083, and a two tail probability of more extreme value of 0.09%. Therefore, there is a positive association between SDLRS and number of hobbies.

What kind of an association exists between SDLRS and the occupation? The test value is 0.3246, and a two tail probability of more extreme value of 0.00%. Therefore, there is a positive association between SDLRS and the occupation of amateur radio operators.

What kind of an association exists between historical events and the development of SDLR? The amateur radio operator population by birth year, Figure 4, is not normally distributed. Since amateur radio operators are high in self-directed learning, it is questioned whether the variance in the amateur radio population indicates a similar variance in the population of high SDLR individuals. However, the quantitative data analyzed in this chapter did not inform the researcher concerning this question. Therefore, the kind of an association that exists, if any, between historical events and the development of SDLR remains to be answered. This question will be explored more fully in Chapter V..

Discussion

The findings noted in the previous pages are similar to those reported in the literature. First, some professional groups such as nurses (Long & Barnes, 1995; Middlemiss, 1987; Russell, 1990) have reported Mean SDLRS scores higher than the Mean reported by Guglielmino (1977). Guglielmino's corpus also included SDLRS scores of children who frequently score less than her Mean of 214. Therefore, even though the SDLRS scores for the amateur radio operator sample used in this study exceed the general Mean reported by Guglielmino, the subsequent significance of the difference may be less than the statistical significance. Furthermore, the self selective process leading to inclusion in the data pool is a source for further caution about the findings. Given the above warning, it is useful to note that amateur radio operators generally characterize the kinds of activities that may be identified with self-directed learners.

SDLRS scores for the amateur radio operators in this study are positively associated with educational level, self-identification with a preference for solitary learning, self-perception as being self-directed, number of hobbies, and professional or white collar employment. In turn female amateur radio operators in the sample had higher SDLRS scores than males in the study. Unfortunately the SDL research literature is equivocal concerning elements in the above profile. The difference between the sexes on the SDLRS

scores of males and females are inconsistently reported. Nevertheless, there is evidence that high SDLRS scores are associated with occupations that require high cognitive function.

Finally, the question of the relationship between historical events and individual SDLRS scores remains problematic. Figure 4 reveals that when a normal curve is imposed over the number of licensed amateur radio operators by age there is a close correspondence between the two. The distribution has several possible explanations. First, it may be implied that the distribution is in some way associated with social-cultural phenomena connected to birth year and early childhood development. This position suggests that where the numbers rise above the curve and when the numbers fail to reach the curve it is an effect of major events such as the Great Depression, major conflicts such as World War I and World War II, etc., and/or associated political/technological developments. Second, it can be argued that the number of individuals licensed and who continue to hold amateur radio licenses, is independent of the above and can be explained by some other phenomena such as SDLR. Third, to the degree that demography is independent of the social cultural phenomena noted above, the distribution may be answered by the number of people in the population. Some demographers, such as Easterlin (1980), have theorized that many social behaviors, such as competitiveness, are a function of birth cohorts. Small birth cohorts are, therefore, less competitive than larger ones. Therefore, if SDLR is associated with competitiveness, a link between birth cohort and SDLRS scores might be established. This research does not satisfactorily achieve that result, however. Therefore, Figure 4 does not definitively support, nor invalidate the association of macro developments with SDLR.

On the other hand, some specific conclusions, based on the research hypotheses, are defensible. They are identified below.

Conclusions

This chapter reports the findings concerning 11 research questions examined by quantitative analysis. Five of the hypotheses were not supported by the findings while five were. One hypothesis was not definitely supported, nor rejected. Based on these findings the following conclusions concerning this sample were obtained.

1. There is an association between SDLRS scores and being an amateur radio operator.

2. There is no association between SDLRS scores and sex.

3. There is no association between SDLRS scores and age.

4. There is an association between SDLRS scores and educational level.

5. There is no association between SDLRS scores and class of amateur radio license.

6. There is an association between SDLRS scores and one's self-assessment of whether one prefers to study alone or in a group.

7. There is no association between SDLRS scores and one's self-assessment of whether they are self-directed learners.

8. There is no association between SDLRS scores and the number of amateur radio operators in a family.

9. There is an association between SDLRS scores and number of hobbies.

10. There is an association between SDLRS scores and occupation.

11. Limited support was found for the conclusion that there may be an association between historical events and the development of SDLR.

Additional insight concerning these conclusions is provided by the qualitative analysis of the interviews reported in Chapter V.

CHAPTER V

Qualitative Analysis

This chapter presents the analysis of qualitative data in three sections. Section I discusses the procedures and describes the interview sample. Section II reports the coding process and major themes/ categories of the findings. The chapter concludes with a discussion.

Procedures and Population

An explanatory framework for considering the information gathered during the qualitative phase of this research is helpful. The multivariate nature of human events makes the application of absolute laws of cause and effect, at best, difficult (Merriam & Simpson, 1984). A tentative explanatory framework can be used to guide the research, even if tempered with Merriam and Simpson's caution, however.

Lincoln and Guba cite J. S. Mills (1985) as recognizing the difficulties associated with the formation of absolute laws and provide an outline of Mills' solution. Mills provides an explanatory framework that was used to guide this inquiry. Three of his five methods of inquiry were identified as most useful. They are; the method of agreement, the method of difference, and the joint method.

According to the method of agreement, the investigator sought to identify one factor (type of experience) that discriminates between those that develop high SDLR and those that do not develop high SDLR. According to the method of difference, the investigator sought to identify one factor (type of experience) that was associated with the failure to develop high SDLR. Finally, the joint method was used to guide the investigator in seeking one factor common to all instances when there is increased evidence of high SDLR and which is absent in all cases where there is evidence to suggest that SDLR is low. Each method, combined with logic, was used to support the assertion that a relationship exists between historical events and the development of SDLR. The facts, observations, and

experiences collected during this research were used to develop an underlying explanatory pattern associated with the development of SDLR that is event related.

It was not the purpose of this exploratory research to prove certain variables cause the development of SDLR. Rather, its purpose was to explore the notion that SDLR is developmental, varies over time within a culture, and that its' development can be associated with events experienced by individuals, and to identify and categorize such events. Therefore, this research was concerned with the development of SDLR associated with the social experiences of individuals who chose to become amateur radio operators. It sought to identify macro events that are associated with the population of amateur radio operators and specific events, meso and micro, that may be associated with an individual's SDLR as evidenced by their participation in the amateur radio hobby.

The survey was designed to answer questions concerning when and where the respondent was when he or she first became interested in amateur radio. Structured interviews were used to increase the consistency of response (Merriam, 1989). The interviewing technique moved from formal to less formal, to completely informal, to finally the non-directive interview as individual questions were explored. Structured questions were followed with open ended questions to aid the respondent in expanding on his or her description of events that occurred in a particular time and place. This approach contributed to a concise focus on the central research question while at the same time providing for theory development (Lincoln & Guba, 1985; Langenbach, Vaughn, & Aagaard, 1994).

Interviews were conducted with individuals in the upper and lower quartiles based on SDLRS scores. The most remote scores from the mean were contacted first as possible

interviewees. To identify the remote or extreme scores, quartiles were established based on the total scores (N=262). The range of scores for the quartiles are as follows:

Quartile I	166-222
Quartile II	223-242
Quartile III	245-256
Quartile IV	257-285

Coding Process and Categories

This section reports on the coding process, develops major themes that emerged from the research, and presents associated findings.

The purpose of the interviews was to identify events that contributed to the respondent becoming an amateur radio operator, and thus, his or her demonstration of high SDLR. Questions moved from, when did you first become interested in amateur radio, age, and place, to more complex questions. More complex questions having to do with events associated with the family (micro), friends and local community (meso), and finally, questions dealing with events associated with the larger world (macro) surrounding the respondent at the time he or she first became interested in amateur radio were asked. This design seemed to aid the respondents in being able to recall events from their past by placing them mentally in the period and location when they had their first experience that contributed to their interest in becoming amateur radio operators. Figure 5 is a histogram that graphically portrays the age of each respondent with a normal distribution curve overlaid. The base year is 1997.

The histogram at Figure 6 provides a graphical way to inspect the distribution of amateur radio operators by age and through that process identify periods during which higher or lower than expected numbers of amateur radio operators were born. Since being an amateur radio operator is assumed to be a function of one's environment and not a naturally occurring phenomena, observed increases and decreases in the distribution of

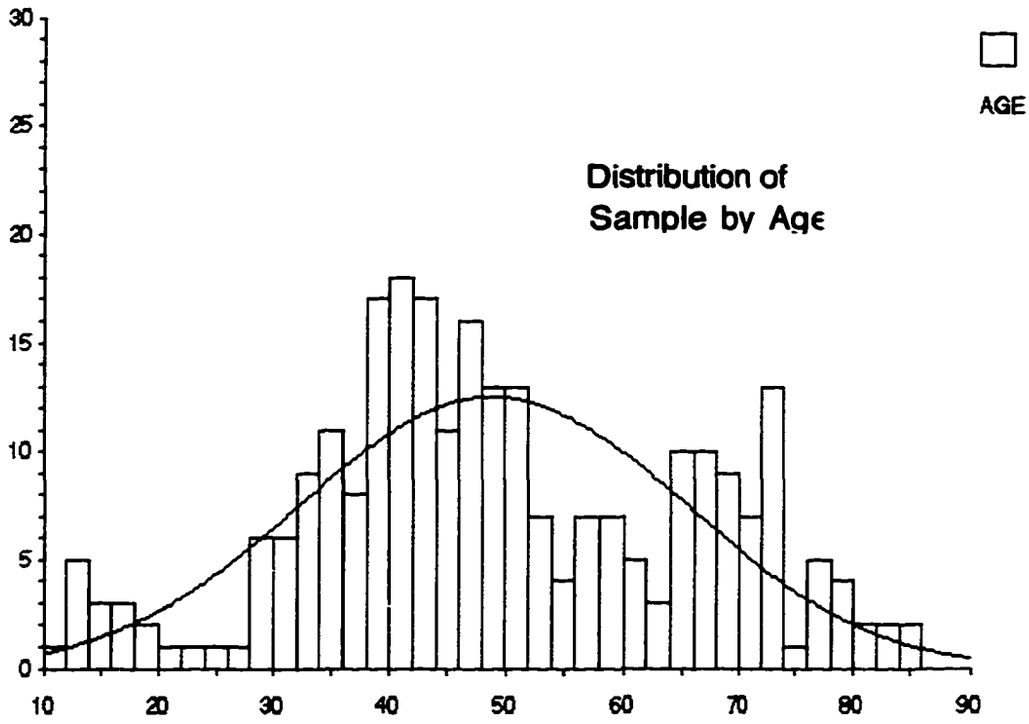


Figure 6. Histogram of Sample by Age.

amateurs by birth year may be explained by variations in their environment. In that participation in the amateur radio hobby has been linked to high SDLR it is possible that variations that effect amateurs also effect high SDLR. It is these variations, called events, that is the focus of the qualitative component of this research.

The years 1923 through 1925, 1949 through 1951, and 1953 through 1959 are of particular interest. These are periods during which higher than expected numbers of amateur radio operators were born. Also of interest are the periods 1927 through 1930, 1935 through 1940, and 1962 through 1971. These are periods during which lower than expected numbers of amateur radio operators were born. These periods of time will be inspected more closely in conjunction with historical events and the interviews conducted with participants in the study.

The following structured questions served as the frame work for the interviews:

- Tell me when you first became interested in amateur radio?
- How old were you?
- Where were you living?
- Describe any event or incident that triggered your interest.
- How did you study to get your license?
- Where did you get information about amateur radio?
- Describe your father and mother's interest in radio.
- What kind of work was your father doing?
- Describe your brothers and/or sisters interest in radio.
- Describe your friends interest in radio.
- What do you remember about the world around you when you became interested in amateur radio?
- Was there a particular world event or situation that contributed to your interest in radio?

Events identified by respondents were categorized according to social setting. Micro for events experienced with family, meso for events associated with friends and community, and macro for events associated with the world beyond the respondents immediate social setting. This approach provided an opportunity to discover when and where in the range of individual experiences the historical events being sought occurred. Therefore, responses were coded both for the micro, meso, and macro events, and also for when the respondent experienced the event. The structured telephone interview questions are in Appendix C.

Interviews

A total of 46 interviewees were selected using the lowest and highest SDLRS quartiles as described above. Four of those selected had incorrect phone numbers, one declined to be interviewed, and one was deceased. A total of 40 interviews were completed. Each interviewee was contacted by phone. A total of 40 interviews were completed. A brief description of each respondent is provided below. The descriptions are organized by first lowest quartile (L 1-20) and highest quartile (H 1-20).

Low Quartile

Subject 1 (referred to as L1) is a white male born in 1973, with 12 years of education. He holds a Technician Plus amateur radio license, prefers to study in groups, and did not identify himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 11. He had a meso experience at age 17 and acquired his amateur radio license shortly thereafter. He became involved in the hobby because of his father's interest. [SDLRS=170]

Subject 2 (referred to as L2) is a white male born in 1923, with 14 years of education. He holds a Advanced amateur radio license, prefers to study in a group, and did not identify himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 10 in Munich, Germany. He had a

meso/macro experience at age 16, studying electronics in school. He acquired his amateur radio license at age 57. He indicated he had no time for radio as a hobby until later in life. [SDLRS=189]

Subject 3 (referred to as L3) is a white male born in 1950, with 14 years of education. He holds a Technician amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 9. He had a meso experience at age 35 and acquired his amateur radio license shortly thereafter. [SDLRS=196]

Subject 4 (referred to as L4) is a white male born in 1920, with 13 years of education. He holds an Advanced amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (meso) that led to his interest in amateur radio as occurring when he was age 17. He had a macro experience at age 18 and acquired his amateur radio license at age 23. [SDLRS=197]

Subject 5 (referred to as L5) is a white male born in 1948, with 14 years of education. He holds a Technician Plus amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 16. He had a macro experience at age 18 and acquired his amateur radio license 16 years after his first experience at age 32. [SDLRS=198]

Subject 6 (referred to as L6) is a white male born in 1957, with 17 years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 8. He had a meso experience at age 12, a macro experience at age 13 and acquired his amateur radio license nine (9) years later. [SDLRS=198]

Subject 7 (referred to as L7) is a white male born in 1936, with 12 years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (macro) that led to his interest in amateur radio as occurring when he was age 23. He had a meso experience at age 33 and acquired his amateur radio license shortly thereafter. [SDLRS=200]

Subject 8 (referred to as L8) is a white male born in 1935, with 14 years of education. He holds an Advance amateur radio license, prefers to study alone, and did not identify himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 10. He had a macro experience at age 32 and acquired his amateur radio license shortly thereafter. [SDLRS=201]

Subject 9 (referred to as L9) is a white female born in 1951, with 12 years of education. She holds a Technician Plus amateur radio license, prefers to study in a group, and did not identify herself as self-directed. She identifies her first experience (meso) that led to her interest in amateur radio as occurring when she was age 32. She had a micro experience at age 36 and acquired her amateur radio license shortly thereafter. [SDLRS=201]

Subject 10 (referred to as L10) is a white male born in 1951, with 14 years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 12. He had a macro experience at age 13, a meso experience at age 32 and acquired his amateur radio license shortly thereafter. [SDLRS=203]

Subject 11 (referred to as L11) is a white male born in 1951, with 19+ years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (micro) that led to his interest in

amateur radio as occurring when he was age 13. He had an uncle that helped him license the same year. [SDLRS=204]

Subject 12 (referred to as L12) is a white male born in 1964, with 12 years of education. He holds an Advanced amateur radio license, prefers to study alone, and did not identify himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 13. He had a meso experience at age 20 and acquired his amateur radio license 21 years later. [SDLRS=207]

Subject 13 (referred to as L13) is a white male born in 1951, with 12 years of education. He holds a Technician Plus amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 11. He acquired his amateur radio license 21 years later. [SDLRS=211]

Subject 14 (referred to as L14) is a white male born in 1948, with 16 years of education. He holds a Technician Plus amateur radio license, prefers to study alone and identified himself as other-directed. He identifies his first experience (meso) that led to his interest in amateur radio as occurring when he was age 13 in the Boy Scouts. He had another meso experience at age 39 and acquired his amateur radio license shortly thereafter. [SDLRS=215]

Subject 15 (referred to as L15) is a white male born in 1941, with 13 years of education. He holds a Technician Plus amateur radio license, prefers to study in a group, and identifies himself as other-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was a teenager, but he is unable to recall his exact age. He purchased an electronic correspondence course while in the Navy (meso) about age 22, became involved with a amateur radio club at about age 29 and licensed a year later. [SDLRS=216]

Subject 16 (referred to as L16) is a white male born in 1927, with 16 years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 10. That same year he had a meso experience. At age 14 he had his first macro experience and licensed at age 19. [SDLRS=217]

Subject 17 (referred to as L17) is a white male born in 1916, with 19+ years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identified his first experience (micro) that led to his interest in amateur radio as occurring when he was age 14. He had a meso experience that same year and acquired his amateur radio license in 1933. [SDLRS=220]

Subject 18 (referred to as L18) is a white male born in 1953, with 12 years of education. He holds an Extra amateur radio license, prefers to study in a group, and identifies himself as other-directed. He identifies his first experience (meso) that led to his interest in amateur radio as occurring when he was age 15. He had a macro experience at age 38, a micro experience at age 40 and acquired his amateur radio license shortly thereafter. [SDLRS=221]

Subject 19 (referred to as L19) is a white male born in 1970, with 16 years of education. He holds a Technician Plus amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 20 when his whole family decided to become amateur radio operators. He acquired his amateur radio license shortly thereafter. [SDLRS=221]

Subject 20 (referred to as L20) is a white male born in 1946, with 14 years of education. He holds a General amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (macro) that led to his interest in

amateur radio as occurring when he was age 40. He acquired his amateur radio license shortly thereafter. [SDLRS=222]

The Low quartile group typically had two experiences with amateur radio that they identified as contributing to their interest in the hobby. The most common first experience was micro; 14 of the 20 respondents reported micro experiences. Four respondents reported a meso event as their first experience. Two respondents reported a macro event as the first experience that led to a lasting interest in amateur radio. All but one respondent cited a micro experience as contributing their abiding interest in amateur radio. Next the High quartile interviews are summarized.

The following table (Table 5.1) summarizes the Low quartile respondents in terms of their birth year (BY), SDLRS score, study preference (alone or in a group), age of first event, age of second event, and age of second event, and age of third event. The events, an incident that contributed to the respondents' interest and ultimate participation in amateur radio, are identified in the table as micro (mi), meso (me), and macro (ma) events.

High Quartile

Subject 21 (referred to as H1) is a white male born in 1924, with 19+ years of education. He holds an Extra amateur radio license, he did not indicate how he prefers to study, and identified himself as self-directed. He identified his first experience (macro) that led to his interest in amateur radio as occurring when he was age 10. He had a meso experience at age 60 and acquired his amateur radio license shortly thereafter. [SDLRS=257]

Table 5.1

Summary of Lowest Quartile Interview Responses

Respondent	BY	SDLRS	Study Preference	1/age	2/age	3/age
L1	1973	170	group	mi 11	me 17	
L2	1923	189	group	mi 10	me 16	ma 16
L3	1950	196	alone	mi 9	me 35	
L4	1920	197	alone	me 17	ma 18	
L5	1948	198	alone	mi 16	ma 18	
L6	1957	198	alone	mi 8	me 12	ma 13
L7	1936	200	alone	ma 23	ma 33	
L8	1935	201	alone	mi 10	ma 32	
L9	1951	201	group	me 32	mi 36	
L10	1951	203	alone	mi 12	ma 13	me 32
L11	1951	204	alone	mi 13		
L12	1964	207	alone	mi 13	me 20	
L13	1951	211	alone	mi 11	me 11	me 32
L14	1948	215	alone	me 13	me 39	
L15	1941	216	group	mi ?	me 22	me 29
L16	1927	217	alone	mi 10	me 10	ma 14
L17	1916	220	alone	mi 14	me 14	
L18	1953	221	group	me 15	ma 38	mi 40
L19	1970	221	alone	mi 20		
L20	1946	222	alone	ma 40		

Subject 22 (referred to as H2) is a white male born in 1917, with 13 years of education. He holds an Advance amateur radio license, he did not indicate how he prefers to study, or whether he is self or other-directed. He identified his first experience (macro) that led to his interest in amateur radio as occurring when he was age 10. He had a micro and meso experiences at age 11. He acquired his amateur radio license 24 years after his interest was first stimulated. [SDLRS=258]

Subject 23 (referred to as H3) is a white male born in 1923, with 19+ years of education. He holds a General amateur radio license, he did not indicate whether he prefers to study alone or in a group, and he identified himself as self-directed. He identified his first experience (micro) that led to his interest in amateur radio as occurring when he was age 14. He had a meso experience at age 15, a macro experience at age 41, and acquired his amateur radio license shortly thereafter. [SDLRS=260]

Subject 24 (referred to as H4) is a white male born in 1943, with 16 years of education. He holds a Advance amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experiences (micro and meso) that led to his interest in amateur radio as occurring when he was age 45. He acquired his amateur radio license two years later. [SDLRS=260]

Subject 25 (referred to as H5) is a white female born in 1973, with 15 years of education. She holds a Technician Plus amateur radio license, prefers to study alone, and identifies herself as other-directed. She identified her first experience (meso) that led to her interest in amateur radio as occurring when she was age 6. She had a macro experience at age 16 and acquired her amateur radio license the following year. [SDLRS=261]

Subject 26 (referred to as H6) is a white male born in 1951, with 15 years of education. He holds a Technician Plus amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experiences (meso and macro) that

led to his interest in amateur radio as occurring when he was age 16. He acquired his amateur radio license 17 years later. [SDLRS=262]

Subject 27 (referred to as H7) is a white male born in 1942, with 14 years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experiences (micro and macro) that led to his interest in amateur radio as occurring when he was age 7. He had a meso experience at age 16 and acquired his amateur radio license 55 years after his first experiences. [SDLRS=263]

Subject 28 (referred to as H8) is a white male born in 1946, with 18 years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (micro) that led to his interest in amateur radio as occurring when he was age 10. He had a meso experience at age 12 and a macro experience at age 16. He acquired his amateur radio license at age 16. [SDLRS=263]

Subject 29 (referred to as H9) is a white female born in 1952, with 15 years of education. She holds an Extra amateur radio license, prefers to study alone, and identifies herself as self-directed. She identifies her first experience (macro) as occurring at age 10, a micro experience at age 11, and a meso experience at age 13. She indicates that each of these experiences led to her ultimately getting an amateur radio license. She acquired her amateur radio license, at age 24, two years after her husband licensed. [SDLRS=263]

Subject 30 (referred to as H10) is a white male born in 1923, with 16 years of education. He holds a Technician Plus amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (meso) while in the Boy Scouts, that led to his interest in amateur radio, as occurring when he was age 16. He had a career in electronics in the Marine Corps and Air Force, and at the University of Kansas. He licensed as an amateur radio operator at age 53. [SDLRS=267]

Subject 31 (referred to as H11) is a white male born in 1941, with 17 years of education. He holds a General amateur radio license, prefers to study alone, and identifies himself as self-directed. He identified his first experiences (meso and macro) that led to his interest in amateur radio as occurring when he was age 10 at a Cub Scout meeting. He had a meso experience at age 14 and acquired his amateur radio license at age 16. [SDLRS=267]

Subject 32 (referred to as H12) is a white male born in 1924, with 12 years of education. He holds an Extra amateur radio license, did not indicate if he prefers to study alone or in a group, and identified himself as self-directed. He identifies his first experiences (micro and meso) that led to his interest in amateur radio as occurring when he was age 10. He had a macro experience at age 16 and acquired his amateur radio license shortly thereafter. [SDLRS=283]

Subject 33 (referred to as H13) is a white male born in 1917, with 19+ years of education. He holds a General amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (meso) that led to his interest in amateur radio as occurring when he was age 9. He had a macro experience at age 50 and acquired his amateur radio license shortly thereafter. [SDLRS=268]

Subject 34 (referred to as H14) is a white male born in 1941, with 16 years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experiences (micro, meso, and macro), that led to his interest in amateur radio, as occurring when he was age 14. He acquired his amateur radio license the following year. [SDLRS=268]

Subject 35 (referred to as H15) is a white male born in 1941, with 19+ years of education. He holds an Advance amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experience (macro) that led to his

interest in amateur radio as occurring when he was age 12. He had a meso experience at age 19 and acquired his amateur radio license at age 40. [SDLRS=271]

Subject 36 (referred to as H16) is a white male born in 1958, with 17 years of education. He holds an Extra amateur radio license, prefers to study alone, and did not indicate whether he is self or other-directed. He identified his first experiences (meso and macro) that led to his interest in amateur radio as occurring when he was age 7. He acquired his amateur radio license eight years later at age 15. [SDLRS=272]

Subject 37 (referred to as H17) is a white male born in 1944, with 14 years of education. He holds an Advance amateur radio license, prefers to study alone, and identifies himself as self-directed. He identified his first experiences (micro and meso) that led to his interest in amateur radio as occurring when he was age 14. He acquired his amateur radio license 10 years later at age 24. [SDLRS=273]

Subject 38 (referred to as H18) is a white male born in 1938, with 16 years of education. He holds an General amateur radio license, prefers to study alone, and identifies himself as self-directed. He identified his first experience (micro) when he was age 9 and had a meso experience at age 14. He reported that these experiences led to his interest in amateur radio. He had acquired his amateur radio license 10 years later at age 24. [SDLRS=280]

Subject 39 (referred to as H19) is a white female born in 1976, with 13 years of education. She holds a Novice amateur radio license, prefers to study alone, and identifies herself as self-directed. She identifies her first experiences (micro and meso) that led to her interest in amateur radio as occurring when she was age 9. She had a macro experience at age 11 and acquired her amateur radio license shortly thereafter. [SDLRS=283]

Subject 40 (referred to as H20) is a white male born in 1938, with 18 years of education. He holds an Extra amateur radio license, prefers to study alone, and identifies himself as self-directed. He identifies his first experiences (micro, meso and macro) that

led to his interest in amateur radio as occurring when he was age 12. He acquired his amateur radio license two years later. [SDLRS=272] (Table 5.2).

The following table (Table 5.2) summarizes the High quartile respondents in terms of their birth year (BY), SDLRS score, study preference (alone or in a group), age of first event, age of second event, and age of third event. The events, an incident that contributed to the respondents' interest and ultimate participation in amateur radio, are identified in the table as micro (mi), meso (me), and macro (ma) events.

The High quartile group typically had two or three experiences with amateur radio that they identified as contributing to their interest in the hobby. The most common first experience was micro, 10 of the 20 respondents. Nine respondents reported a meso event as their first experience. Of interest is the fact that 10 respondents reported their first experience with amateur radio included two types of events. It is also noted that nine of the twenty respondents reported experiencing all three types of events by age 16.

Coding Categories

Two major categories, High and Low quartile respondents, were dictated by the research design. Both quartiles are drawn from the same sample of amateur radio

Table 5.2

Summary of Highest Quartile Interview Responses

Respondent	BY	SDLRS	Study Preference	1/age	2/age	3/age
H1	1924	257	?	ma 10	me 60	
H2	1917	258	?	ma 10	mi 11	me 11
H3	1923	260	?	mi 14	me 15	ma 41
H4	1943	260	alone	mi 45	me 45	
H5	1973	261	alone	me 6	ma 16	
H6	1951	262	alone	me 16	ma 16	
H7	1942	263	alone	mi 7	ma 7	me 16
H8	1946	263	alone	mi 10	me 12	ma 16
H9	1952	263	alone	ma 10	mi 11	me 13
H10	1923	267	alone	me 16		
H11	1941	267	alone	me 10	ma 10	me 14
H12	1924	283	alone/ group	mi 10	me 10	ma 16
H13	1917	268	alone	me 9	ma 50	
H14	1941	268	alone	mi 14	me 14	ma 14
H15	1941	271	alone	ma 12	me 19	
H16	1958	272	alone	me 7	ma 7	
H17	1944	273	alone	mi 14	me 14	
H18	1938	280	alone	mi 9	me 14	
H19	1976	283	alone	mi 9	me 9	ma 11
H20	1938	272	alone	mi 12	me 12	ma 12

operators, who by their actions fit the operational definition of high self-directed learners. A number of individuals who chose to become amateur radio operators because they were influenced by someone else are within this group, however. Therefore, it was concluded that suitable respondents from within the first quartile and the fourth quartile could be identified for follow-up interviews.

The principle purpose of the interviews were to investigate the relationship, if any, experiences played in the respondent's entry into the amateur radio service and thus their individual display of high SDLR.

Based on the literature review two primary categories emerged, micro and macro events. Micro events are associated with the respondent's immediate family (Long, Redding, & Eisenman, 1992, 1993 and 1994a; Stubblefield, 1992). Macro events (Long, 1989b, 1990b; Schooler, 1990) are associated with the larger society; world and national events, and the introduction of new technology. A third category, meso events, was added to address those events that occur outside the family, but which are not macro in nature. Meso events include experiences with friends, in clubs, at school, and in church to name the most common settings. Therefore, each event is tied to a social setting (micro, meso, macro) and a point in time.

The time component added another set of variables to the coding of events. Time is reported in terms of the respondent's age at the time an event occurred. During the initial interview process it was noted, repeatedly, that extended periods of time passed between when most respondents first became interested in amateur radio and when they finally entered the hobby. Therefore, a final category associated with time was added for coding; delay in years between first interest and licensing.

The following tables provide a summary of the various categories in terms of descriptive statistics. This summary is useful in understanding the differences that exist between the Low and the High group.

Table 5.3 through Table 5.5 provide descriptive statistics to describe the characteristics of the two group of individuals interviewed. Two sets of data are provided in each table. One set of data from the Low quartile group of respondents, and the other set of data from the High quartile group of respondents. Each minor category, SDLRS score, birth year, micro age, meso age, macro age, and delay in years from first event to being licensed will be discussed.

SDLRS Score

Comparing the Low and High quartile SDLRS descriptive statistics, Table 5.3, reveals that the standard deviation of the High quartile (SD 7.64) is noticeably smaller than the standard deviation of the Low quartile (12.68). This implies that the members of the High quartile are more similar to one another in terms of SDLRS scores than are the members of the Low quartile group.

Birth Year

The Mean, Mode, and Median birth year, Table 5.3, for the Low group are 1945.55, 1951, and 1949 respectively. The mean, mode, and median for the High group are 1941.95, 1941, and 1941 respectively. The Low group is on the average about 10 years younger then the High group. Comparing the two group's age to Figure 5 it is can be to noted that the High groups age plots during the period when the total number of

Table 5.3

Comparison of Low and High Quartile Descriptive Statistics for SDLRS and Birth Year

	SDLRS		Birth year	
Quartile	Low	High	Low	High
Mean	205.35	267.55	1945.55	1941.95
SD	12.68	7.64	15.22	15.76
Mode	198	263	1951	1941
Low quartile	198	261.5	1935.5	1928
Median	203.5	267	1949	1941
High quartile	216.5	272	1952	1948.5
Sml value	170	257	1916	1917
Lrg value	222	283	1973	1976
Numerical value	20	20	20	20
Coefficient variable	6.334	2.929	0.802	0.833
Kurtosis	1.349	-0.263	-0.314	0.275
Skewness	-0.844	0.734	-0.28	0.548

Table 5.4

Comparison of Low and High Quartile Descriptive Statistics for Micro and Meso Experiences

	1st Micro age		1st Meso age	
Quartile	Low	High	Low	High
Mean	15.4	13.7	20.6	16.2
SD	9	9.3	9.2	12.7
Mode	10	14	10	12
Low quartile	10	10	13	10
Median	12.5	11	17	12.5
High quartile	15	14	32	15.5
Sml value	8	7	10	6
Lrg value	40	45	35	60
Numerical value	16	13	13	20
Coefficient variable	60.637	70.455	46.381	80.599
Kurtosis	3.64	11.423	-1.479	7.393
Skewness	2.109	3.294	0.571	2.74

Table 5.5

Comparison of Low and High Quartile Descriptive Statistics for Macro Experiences and Delay in Licensing

	1st Macro Age		Delay from 1st to License	
Quartile	Low	High	Low	High
Mean	24.2	16.6	16.9	16.9
SD	10.8	12.3	12.2	14.9
Mode	13	10	0	2
Low quartile	14	10	5	5
Median	18	12	19.5	11
High quartile	38	16	24.5	27.5
Sml value	13	7	0	1
Lrg value	42	50	47	55
Numerical value	11	14	20	20
Coefficient variable	46.925	76.832	74.177	90.421
Kurtosis	-1.528	3.745	0.175	0.454
Skewness	0.598	2.128	0.506	1.07

amateurs were born was well below the normal distribution. While the plot of the Low group's age places them during the period when the number of amateurs being born is well above the normal distribution.

First Micro, Meso, and Macro Event by Age

Consistently the Low group on the average (mean) appears to be older (age 15.4 and 20.6) than the High group (age 13.7 and 16.2) when its members had their first micro or meso experience. This continues to be true for the median age at which the first events occur. The most often reported age (the modal age) at which these events occur, however, is reversed for the micro and meso events. The Low group, with a cohort birth year of 1951, is analyzed in greater depth below. Therefore, individuals in the Low group often have their first micro and meso experience before individuals in the High group. Micro and macro events were not experienced by all respondents in either the Low or High groups. However, all members of the High group reported experiencing meso events.

Micro Events. The most common micro event was the gift of a crystal radio kit, or the construction of a radio or electronic device by the respondent during the period age 7 to 12. These events were scored as both micro and macro because of the technology component in the event. High group respondents typically expanded the experience by pursuing follow-on learning projects on their own. These early events seemed to lead to a reoccurring pursuit of knowledge of a technical nature across their life time. Most indicated that this early experience in life contributed not only to their choice of hobbies but also to their selection of educational pursuits and vocation.

Meso Events. The most common meso event was the experience of learning Morse Code or some other form of a communications activity while participating in the Boy Scouts of America. A close second kind of event in terms of frequency reported, was the experience of having a close friend with whom the learning experience and ultimate pursuit of amateur radio as a hobby was shared. Members of the High group often identified

themselves as the leader of the learning effort and the most persistent across their life time. While they reported maintaining contact, often their friend is no longer active in amateur radio.

The Low group respondents often cited the influence of a close friend or family member as introducing them to the hobby. More often than not they have maintained the friendship, however Low group respondents often were no longer actively involved in the hobby.

The preceding analysis of the interviews examined the relationship between Low and High quartile respondents, and events coded micro, meso and macro. The analysis focused on the difference between the respondents grouped in the first and fourth quartile. Next the analysis will focus on those periods in which a below normal distribution of amateurs and periods in which above normal distribution of amateur radio operators were identified. Interviews of amateurs born during these periods will be reexamined with a particular emphasis on identifying events that are common to these two groupings.

Peak Birth Year for Low Group Amateur Radio Operators, 1951

Further analysis of the two groups of amateur radio operators was warranted. The most often reported birth year for the Low group was 1951, during a period when entry into amateur radio was above the normal curve (Figure 5) for the sample. Therefore, interviews from amateurs born in 1951 were analyzed to determine what shared events, if any, might emerge.

The following abstracts cover the key points of the interviews from those born in 1951. This material was examined to see if a framework could be identified that might explain why the Low group is highly represented in this year.

L9, Birth year - 1951, SDLRS - 201, Sex - Female, Race - White.

He reported she first became interested in amateur radio as an adult. Later she indicated that she might have become interested in radio as a child watching war movies. She entered the amateur radio service at age 36. Her husband and children decided to become amateur radio operators and so she decided to make it something the whole family did together. When pressed to identify an earlier event that contributed to her interest in amateur radio she responded with:

> "Well in watching movies you would see a little bit - it may not actually have been amateur radio, but it may have been during the war movies ... the guys would have those radios that they could talk from and stuff .. so it may not have been real amateur radio."

When pressed to identify other events that may have influenced her decision to become an amateur radio operator she identified "severe weather watch" and "public service."

L10, Birth year - 1951, SDLRS - 203, Sex - Male, Race - White.

Reported he first became interested in electronics working with an older brother (by fours years) while doing experiments with batteries, motors, and a home made crystal radio at about age 12 or 13. He got his Novice at 19 while in college. He attempted to upgrade immediately, but failed. He and his brother share the same professional training, electronics. Both upgraded to an Advanced class amateur radio license in about 1984. This respondent serves as the volunteer emergency communications coordinator for the Red Cross and his county in southwest Oklahoma.

L11, Birth year - 1951, SDLRS - 204, Sex - Male, Race - White.

Respondent's uncle was a amateur radio operator and during the uncle's visits the respondent became aware of and then interested in amateur radio. The respondent's family told stories of the uncle's mobile amateur radio in his car interfering with pizza parlor public address (PA) systems and PA systems in churches. The stories fascinated the respondent. The respondent was fascinated with his uncle's ability to communicate. His

uncle became his mentor and gave him his Novice exam. The respondent lived in a rural Kansas town. The nearest large town was 50 miles away. While conscious of the Vietnam war, and the death of President Kennedy, the responded reported that these events really didn't effect him.

L13, Birth year - 1951, SDLRS - 211, Sex - Male, Race - White.

The respondent reported that he first became interested in electronics at age 11 through helping a friend of his father's repair black and white TV sets. Next followed an interest in communicating through Citizen Band which the respondent did off and on, until age 32 when through an informal study group he learned enough material to pass his amateur radio written and code tests. At about age 32 the respondent became involved with a circle of friends that met at a local fast food restaurant. He described the situation this way (sic):

> "Well, ah an elmer and my elmer, his call sign is WC2A, and he lives in Brooklyn, NY, and we hung around in MacDonalds on an every night basis, where other amateur radio operators would drop in on us practically every evening and I studied code and I studied theory, and I passed my Novice. This was before the no-code tech. ..... I met Bob ... let me see through hanging around places other hams that knew Bob and Bob sort of was an older gentleman ... he took a liking to me and wanted me to become a ham because he thought I'd be a good ham. ... I was interested mainly in Dxing."

When pressed to identify three aspects of amateur radio that hold his attention he responded, "Ah, speaking long distance, phone communications, and learning new things about the hobby."

H6, Birth year 1951, SDLRS - 262, Sex - Male, race - White.

The respondent reported he first became interested in amateur radio in high school, but that he didn't really pursue it as a hobby until 1983 (about age 32). His initial interest was kindled by a high school physics teacher who was also an amateur radio operator. In 1983 he and his wife were at a county fair where the local radio club had a booth set up.

When they stopped at the booth, he told his wife it was something he was interested in, and they both decided to become amateurs. They attended class together and licensed together.

When pressed about his initial interest in radio and why he didn't act on it at the time he reported that there was no time. The teacher introduced amateur radio the last month of the school year and did not return the next year. The respondent, however, developed an abiding interest in radio, became a short wave listener, and enjoyed listening to foreign broadcasts and the police bands. He was particularly fascinated with the radical, anti-American broadcasts. He clarified this interest by saying "Don't get the wrong idea, I wasn't a protestor or anything, but I was interested in how the other side talked about us."

He is a computer professional and he reports he spends his leisure time working with computers at home. He is currently teaching himself how to program in C++ for Windows `95. When pressed to identify any other situation or world event that kindled his interest in amateur radio he began discussing trains (trains were a reoccurring theme among all groupings of respondents). He went on to say (sic):

> "Not really, however in at least the local club and the radio club in Kansas City an awful lot of folks have another interest that seems totally unconnected with this .. also have a high interest in radio, and that's trains. ... I don't know if that it's that way all over the country, but from looking on the internet, I think it is. I don't know why, it's the common element of a lot of hams. ... You know locally you would have to say 3/4th of the members of the group love trains. ... They come through town and not exactly at a high rate and I'll be out there watching them go by so. The same thing for others, I don't know but looking at the internet most of the computer, train enthusiastic groups and the ham groups look a lot alike. I don't know why, but it's something interesting and may be a good place for hams to look to recruit folks cause there seems to be a common interest."

Summary of Birth Year 1951. The five respondents born in 1951 present several common threads. Each contained a combination of micro, meso, and macro experiences. Each viewed amateur radio as a service oriented hobby that could facilitate communications between family members and friends. None of the respondents licensed in their youth. Each reported developing an interest in radio during their youth, but not becoming active in amateur radio until fully adult and able to share it with a family member.

Maybe most importantly, each reported having someone else to work with that helped them acquire their amateur license.

The second group considered worthy of additional exploration were those individuals born in 1941, the most common birth year for the High group, and a period during which the total number of amateurs born was well below the normal distribution. Four respondents were selected. Each born in 1941.

H11, Birth year - 1941, SDLRS - 267, Sex - Male, Race - White.

The respondent attributes his interest in amateur radio to his Boy Scout experience and efforts he made to earn a merit badge in communications when he was 14 or 15 years of age. However, he had much earlier experiences that contributed to his interest. He said (sic):

> "Yeah, that's when I started...I didn't actually get my license till I was 16, but we started studying on it when I was 14 or 15. I built my first receiver when I was in the sixth grade....One of those Heathkits, well I built a crystal set before that...probably built the crystal set when I was in the fourth grade."

The respondent's interest in radio communications preceded his awareness of amateur radio in the Boy Scouts. He described his developing interest this way (sic):

> "Ahm, can't really remember being exposed to amateur radio before that (the Scouts) because I was just mainly interested in listening to shortwave broadcast from an international ... (How old were you?) Oh ah fourth or fifth grade, somewhere along in there. I guess the radio my dad had also had the shortwave band on it...the big radio...use to play with that a little bit. I can remember about the fourth grade I would literally get back up after everybody else went to bed and flip the old radio on ... with a tuning eye ... I was fascinated with the signal strength cause that had something to do with how much closer (the eye would close as strength increased) you would get on that eye late at night when the bands quieted down and you could listen to those very clear signals and the eye would hardly close at all, but you could get a tuning indication with it. ... We got up on the roof and strung some wire over the roof so we could get more signal."

The respondent further explained that the local amateur radio club provided training for the Boy Scouts, that the club was run by individuals that were motivated by profit because they owned the local radio and electronics store who sold Army surplus radio, electronic, and telephone equipment.

H14, Birth year - 1941, SDLRS - 268, Sex - Male, Race - White.

The respondent first became interested in amateur radio about 1955 when he was age 14. He became interested through listening to the family radio. It had shortwave bands. His mother knew of his interest and read in the newspaper about an amateur radio club that met at a local school, that was starting licensing classes. His father provided transportation. The respondent met a boy a few years older that became his friend and mentor. His mentor, also a teenager just old enough to drive, was the organizer and leader of the amateur radio club. Three other individuals in his high school class also became amateurs. As a result of the local amateur radio club being formed primarily with teenagers, the respondent became an amateur radio operator. The respondent described the development of his initial interest with these words (sic):

> "Yeah we owned an old wooden floor model Zenith radio, and I took an interest in listening to various things in the shortwave bands there with that radio and then my mother had read about a radio club meeting in our school at that time and of course my father was the taxi service we lived in the country and he carted me into the radio meetings and a W2EZS was my mentor. ... I listened to what ever was out there. ... Yeah and just listen to what there was. Of course then there was a lot of HF and they still did the airline positioning reports were done on HF. ... I would find those, plus you had the cities around the world on the dial you know. ... Yeah, there was a couple of other guys in my class, K2OFY and K2OSN, the Bliesdale brothers they were interested also. There was another guy, but I forget the call signs of some of the other folks. ... Yeah, yeah, we were all pretty close (in age). ... They licensed before me...I was stuck out on the farm after that, and then of course we went through the normal stuff. You know radio was just one small, I'd say it was an integral part of my development there, but it was not, it didn't dominate my life. ... We did a tape recording of the Sputnik when it went up. We took the recording to our science class. ... I am not sure if it was a club project ... remember the club was just us guys."

The respondent went on to say that he was involved in sports, athletics, hunting, attended college, and had a career as a pilot in the Air Force. He indicated that his amateur radio experience has affected every facet of his professional life. Although he never studied communications as a profession, his amateur communications background contributed to his ability to set up remote radio stations, make phone patches, perform his duties, and stay in contact with his family while flying world-wide. He retired from the

U.S. Air Force after 22 1/2 years, had a commercial aircraft sales position, but later went into emergency communications management with county government. He describes himself as having operated radio stations in Asia, Africa, and Central America. Today he is very involved in mentoring others in becoming amateur radio operators.

H15, Birth year - 1941, SDLRS - 271, Sex - Male, Race - White.

The respondent became interested in amateur radio when he was age 12. He built a one tube receiver and discovered that he could use it to transmit in the AM band. He describes himself as always being interested in science in school, but that he had no involvement with amateur radio. He didn't know anyone that was involved in the hobby. He discovered material on the hobby in the library, wrote the American Radio Relay League and got copies of their promotional material. He was a member of the Boy Scouts but his troop was never involved in radio. He was studying physics. His college had a ham club, he never became involved in the club. His formal interest in becoming an amateur radio operator materialized when he started teaching physics. He decided to make amateur radio a part of his classes. As he taught his students he acquired the knowledge to pass his the exam to acquire his own amateur radio license. He reported that he contacted a stranger to give him his first test and that he prepared for the exam alone. The hobby was never something he shared, except with his students in the classroom. He teaches in a college and has licensed two dozen foreign students who have used amateur radio to speak with their family and friends in their home countries. Today he serves as a mentor to the local hams, organizing on the air nets, and other group activities. His other hobbies include rocketry and model building.

L15, Birth year - 1941, SDLRS - 216, Sex - Male, Race - White.

The respondent reports that he is not currently active in amateur radio. He reports that his first interest in radio may have been kindled by his fathers description of a crystal radio set when he was a teenager. He reports that he started studying radio and electronics

in the Navy. He attempted several correspondence courses, including a DeFry Institute course but never finished.

About six years after leaving the Navy he joined a local radio club, took their course and acquired his amateur radio license. Interestingly, this respondent communicated in short, two to five word, responses except when discussing current learning projects associated with his professional work. Then his responses increased to 50 to 250 words in length.

The respondent's self-assessment for why he approaches learning the way he does is that he may have a learning disability such as Dyslexia. He indicated he believed that individuals with learning disabilities are forced to devise ways to learn on their own.

Summary of Birth Year 1941

The four respondents born in 1941 present several common threads. Each respondent indicated a strong meso component to the events that led to their interest in the amateur radio hobby. Each indicated their first experience occurred at age 14 or before. There was no consistent pattern of the type of experience (micro, meso, macro), however, there was a strong communications component to each individual's experience and support through group experiences that aided them in kindling and sustaining their interest in radio. Born in 1941, they were too young to personally remember WW II which ended when they were age 4. The America they grew up in was optimistic after having just defeated the Axis Powers, but more aware than ever before that isolation from the rest of the world could no longer be considered a form of protection. The Cold War was in full swing, and the Korean Conflict occurred while these respondents were ages 9 through 12.

Discussion and Findings

The research designed called for interviewing 40 respondents. From the pool of respondents, 20 from the first quartile (Low group) and 20 from the fourth quartile (High group) were interviewed to determine if they had a single identifiable experience from their

youth which influenced their ultimate entry into the amateur radio hobby. The interviews produced over 15,000 lines of transcribed text.

From the literature review it was determined that coding would address micro and macro events. A third category, meso events, was added. To these three categories the dimension of time was added permitting the age of the respondent to be associated with a micro, meso, or macro event. The data indicate that the average age of these events is in the range of 10 to 16 years. This suggests Massey's (1979) notion of value formation at age 10, might more correctly be thought of as age 12 to 14.

The Federal Communications Commission (FCC) data base records the year of birth of US amateur radio operators. HamCall (1993) is a commercial release of the FCC data base. This information was used to construct a histogram of the distribution of US amateur operators by birth year (see Figure 4). The total US population of amateur radio operators in 1990 was in excess of 500,000. A histogram, overlaid by a normal distribution curve graphically portrays those birth years during which higher and lower than expected numbers of amateur radio operators were born. The distribution was expected to be normal. Certain birth year periods, such as those associated with the Great Depression, World War II, and the Vietnam War appear to be associated with lower than expected numbers of amateur radio operators.

In particular, two points in time appear to be of interest; birth year 1922 and birth year 1935. The year 1922 is the point when the increase in the normal distribution turned negative and remained so through birth year 1935. It lends support to Massey's (1979) premise, supported by Bandura (1986) and Jarvis (1992) that value formation at about age 10 can affect a person for the rest of his or her life. By adding 10 to 12 years to their birth year period 1922 through 1935, it can been seen that these individuals experienced the Great Depression and World War II.

The FCC data base contains a number of individuals that maintain their amateur radio operators' license but who are not in fact active in the hobby. Since an amateur radio license is issued for a period of 10 years, with an additional two year grace, the FCC data base also contains a number of individuals who licensed but who are no longer active. The self-selected nature of the sample amateur radio operators used in this study insured that only active amateur radio operators were represented. Therefore, the study sample is a better representation of high self-directedness as indicated by being an amateur radio operator and a participant in the study.

Figure 5, Histogram of Sample by Age, confirms the selection of birth year 1922 and 1935, from Figure 4, as two birth years that produce fewer than expected amateur radio operators. It also supports the notion that the number of amateur radio operators that entered the hobby from the period of the Vietnam War was also well below normal.

Using Figure 5 and Mills' (Guba, 1985) method of agreement, the investigator sought to identify one type of experience that discriminated between those that are high in SDLR and those that are not. Birth years 1925, 1951, and 1962 appear to correlate with periods of increased numbers of amateurs. If one adds 10 years to see what was occurring in the US during the periods that Massy (1979) indicates values are being formed, the following pattern emerges. Birth year 1925 becomes 1935, near the end of the Depression, but before World War II. Birth year 1951 becomes 1961, after the Korean Conflict but before the Vietnam War. Birth year 1962 becomes 1972, generally after the Vietnam War. If we tentatively accept the notion that being an amateur radio operator is a demonstration of being high in SDLR, then the unexpected variation in the distribution of amateurs by birth year may be used as an indication of when something in the environment is effecting the development of high SDLR. It is interesting to note that respondents, during interviews, rarely mentioned these macro events, and never associated them with developing an interest

in amateur radio. Yet, this does not mean that they were not influenced in some unknown way by the impact of the Great Depression on American society.

According to Mills method of difference, the investigator sought to identify one factor (type of experience/event) that was associated with the failure to develop high SDLR as evidenced by a below expected number of individuals that enter amateur radio by birth year. National crisis, operationally defined as a depression, or national war, appear to be a type of macro event that depresses the number of high SDLR individuals. Inspecting Figure 5, it can be seen that the number of amateurs by birth year is depressed for ages 75 to 77, ages 62 to 64, age 45, and ages 36 to 38, adjusted by Massey's (1979) value formation age. Thus adjusted, these ages corresponding to the Great Depression, World War II, the Cuban Missile Crisis, and the Vietnam War.

In accordance with Mills' joint method, the investigator sought one factor common to all instances when there is an increased evidence of high SDLR, and which is absent in all cases where there is evidence to suggest that SDLR is low. The above demonstration of data and discussion can be used to support the notion that a relationship exists between historical events and the development of SDLR, as demonstrated by variations in the amateur radio population by birth year. The common factor associated with increased high SDLR appears to be periods of national peace. When this factor is absent, there is evidence (fewer amateurs) that the manifestation of high SDLR is decreased.

Low Group

The Low group was more likely to engage in amateur radio as a member of a group. They typically had experiences within their family and immediate community that contributed to their lifelong interest in amateur radio. The Low group members were most often influenced by micro events. Less frequent were the larger cultural experiences. The macro experiences were generally associated with the introduction to technology such as the construction of a crystal radio set.

High Group

The High group members were more likely to engage in amateur radio alone. When in a group they often assumed the role of leader. All members of the High group encountered meso experiences that contributed to the lifelong interest in amateur radio. They were more likely to have multiple types of experiences (micro, meso, macro) that contributed to their developing and interest in amateur radio.

Micro Events

Micro events were associated with the respondent's immediate family. Typically they consisted of the gift of a crystal radio set at Christmas and its subsequent successful construction. Also common, was the experience of using a family radio with short wave bands to listen to foreign broadcasts. High group members tended to focus on the technology, while Low members tended to be more impressed with the ability to listen to foreign broadcasts and gather information about the world around them.

Meso Events

Meso events included experiences with friends, in clubs, at schools, and in church that can be associated with developing an interest in amateur radio. The most common form of meso event was associated with scouting activities. The second most common meso experience was having a close friend, often older, with whom the respondent was able to share the experience of becoming an amateur radio operator. Low group participants in meso events were often followers, while High group participants often assumed the leadership role.

Macro Events

The introduction of technology was the most common macro event, as manifested by either a crystal radio set, or the building of a more sophisticated type of radio receiver. A close second for the most common type of macro event was the use of a family owned shortwave receiver to listen to foreign broadcast stations. Typically, the macro experience

was associated with an interest in the larger world and a desire to know more of what was happening. Even though, none of the respondents cited a major world event, depression, war, or conflict as contributing to their general interest in amateur radio these kind of events cannot be discounted entirely.

Peak Birth Year, Low Group

The peak birth year for the Low group corresponded with a peak in the total number of amateur radio operators being born at a particular point in time. Trying to understand what kinds of events lead to individuals generally low in SDLR to engage in high self-directed learning activities seemed worthy of further exploration.

The peak birth year for the Low group was 1951, during the "baby boom". It coincides with a peak well above the normal distribution for the number of radio amateurs by birth year being born. An improved understanding of the micro, meso, and macro social environments that contributed to increased high SDLR activity is desirable. A common pattern, that may be helpful, emerged from the interview data. All respondents born in 1951 experienced micro, meso, and macro events that they associated with becoming amateur radio operators.

While having experiences in their youth that contributed to their interest in radio, none of the respondents born in 1951 actually acquired their amateur license in their youth. Instead, they each licensed later, after becoming fully adult; and in some degree they were motivated by the common desire to be able to communicate readily with other family members. They also found someone to assist them in acquiring their license. Born in 1951, they were too young to have direct personal memories of the Korean Conflict. The America they grew up in was conscious of world communication and technology. Their early developmental years preceded the Vietnam era (1964 - 1974) and seems to be characterized by a supportive macro climate that made it safe for meso learning relationships, and affluent enough for micro learning opportunities to be available.

Peak Birth Year, High Group

The peak birth year for the High group was 1941, a year that was well below the normal distribution for producing amateur radio operators. The question then becomes, what factors contributed to a large number of individuals becoming highly self-directed learners during a period that generally produced below the expected number of high SDLR individuals? Education was important and being able to manage the new technologies associated with electronics was a priority for school systems.

These respondents each reported having micro, meso, and macro experiences that contributed to their developing interest in radio. All experienced technology and the fascination associated with shortwave listening and building electronic equipment. Born in 1941, they were too young to have direct personal memories of World War II which ended when they were age 4. The America they grew up in was optimistic after having just defeated the Axis Powers, but more aware than ever before that isolation from the rest of the world could no longer be considered a form of protection. The Cold War was in full swing, and the Korean Conflict occurred while these respondents were ages 9 though 12.

What Kind of Association is there Between Historical Events and the Development of SDLR?

There appears to be evidence to support the notion that there may be an association between the development of high SDLR and the events experienced by individuals during their youth. It is speculated that the strongest association appears to be macro, but is not reported by the respondents. Schooler (1990), among others, indicate that societal influences may exert pressure on individuals and influence their choices and propensity toward self-directedness unconsciously. The development of High SDLR appears to be tied to certain types of events at the micro and meso level, and to the introduction of new technology at the macro level.

Discussion

The examination of the Lowest and Highest quartiles and analysis of the respondents born in 1951 (Low SDLRS) and 1941 (High SDLRS) are informative. The interview data when coded as micro, meso, and macro phenomena imply some differences between Low quartile respondents and High quartile respondents. Low respondents tend to enter the amateur radio hobby with someone else. They are older when they license and identified micro events as the most common type of experience that led to their lifelong interest in amateur radio. High respondents are more likely to pursue their amateur radio interests alone. When in a group of amateurs they tend to assume the leadership role. They license at an earlier age than the Low respondents and the High respondents identify meso events as the most common type of experience that led to their lifelong interest in amateur radio.

As this inquiry is exploratory in nature and is designed to attempt to find associations rather than cause - effect it is not necessary here to establish why the differences exist. Neither is it necessary to conclude that the differences between Low and High quartile amateur radio respondents fully explain the differences in SDLRS between the two groups. Nevertheless, the identification of the kinds of differences that exist between Low and High respondents, such as the importance of micro events to one group versus the importance of meso events to the other provides opportunity for further study. Similar, the tendency to be a leader versus a follower needs to be explained. There are other interesting differences suggested in the interview data. For example, the 1951 Low SDLRS group members obtained their amateur radio licenses after becoming adults compared with the High SDLRS group licensing as adolescents. The interplay of micro, meso, and macro phenomena may be of further interest as elements in individual situations.

For example, the 1941 group members were born before the general availability of television. Also, telephones as communications instruments were limited in distribution.

Compare that macro situation with the macro conditions that prevailed for the 1951 sample. They were born after television was gaining wide distribution in American homes, telephone communications was becoming common place, and the format and importance of radio broadcast was changing. Consequently, it can be speculated that the Low group members who were not particularly interested in being independent learners did not feel a need or develop an interest in the communications technology manifested by the 1941 High group. Of course, this does not explain how or why the 1951 group had low SDLRS scores, neither does it explain the reverse in the 1941 group, but it does reveal how macro phenomena may be related to behavior and preferences.

Summary

This chapter reports the results of the qualitative analysis of the interviews that sought to discover a single type of event that contributed to the development of High SDLR.

First the distribution of the sample of amateur radio operators by age was inspected against a normal distribution to determine if there were periods of time when the number of amateurs by birth year was above or below the normal distribution. Points in time were selected, both when the number of amateurs were high, and when the number of amateurs were low. These points in time were then considered in terms of major events that coincided with the development of an interest in amateur radio.

Qualitative interviews were analyzed from the Low and High group, coding micro, meso, and macro events in terms of the age of occurrence of each event in the life of the respondent, in order to associate various events with the development of SDLR.

The Low group peak birth year, and the High group peak birth year were further analyzed to determine what type of shared experiences might emerge from the analysis. The findings indicate support for the notion that the development of SDLR may be associated with individual experiences during the development years. Micro, meso, and

macro events may play a part in the development of SDLR. The macro component appears to exert an unconscious influence on members of society.

The data indicate that the topic is complex and would benefit from further study. Each type of experience/event, micro, meso, and macro might influence the development of SDLR. The data indicate that exposure to new technology in the home can contribute to the development of high SDLR. Further, more opportunities to learn in a group setting may have a positive effect on the development of SDLR for members of the Low group. The macro component may be the most powerful in influencing the development of SDLR in a society.

CHAPTER VI

Conclusions, Implications, and Recommendations for Further Research

The purpose of this study was to determine the association between historical events and the development of self-directed learning readiness (SDLR) of amateur radio operators as measured by Guglielmino's (1977) Self-Directed Learning Readiness Scale. A demographic questionnaire and 40 interviews provided additional data. This study examined the association between adult self-direction and being an amateur radio operator, sex, age, educational level, class of amateur radio license, self-assessment of whether one prefers to study alone or in a group, self-assessment of whether they are self-directed learners, number of amateur radio operators in a family, number of hobbies, occupation, and whether there is an association between historical events and one's development of self-directed learning readiness.

Two hundred and sixty-two U.S. Amateur radio operators participated in the study. They were asked to complete the SDLRS, a questionnaire designed by Guglielmino (1977) to measure readiness for self-directed learning. Participants were self-selected through solicitation to participate in a national amateur radio magazine, invitations extended in amateur radio conferences, through amateur radio clubs, and through on the air contacts.

The SDLRS with accompanying demographic data was scored and tabulated. The subjects were subsequently divided into four groups using standard deviation. Two groups, one group comprised of individuals with of SDLRS scores within the first quartile, and a second group of those scoring within the fourth quartile, were selected and interviewed. The qualitative data were then analyzed.

The potential interviewees for the qualitative analysis were selected based on the highest and lowest individual scores on the SDLRS. Forty individuals, 20 from the first quartile, and 20 from the fourth quartile were interviewed. The quantitative phase of the

analysis focused on the association between 11 variables and SDLRS scores. The qualitative analysis followed with focused interviews that moved from structured to open questioning techniques designed to explore individual experiences related to their becoming amateur radio operators and demonstrating high self-directed learning. Coding was developed that address micro, meso, and macro events that subsequently were tied to the age of occurrence.

The information obtained from the interviews raised questions concerning the impact the micro, meso, and macro events might have on the development of SDLR, and the importance of age at which these events occur. Other implications associated with the larger cultural climate, and its interaction with micro and meso experiences that occur during youth, the development of SDLR, and the pursuit of lifelong learning raise additional questions.

Final Characterization

The interviews presented the following profiles of Low and High quartile respondents.

Low Quartile

1. The birth year for this group, 1951, was a year in which the peak of the number of amateur radio operators by birth year was higher than expected.

2. Most Low quartile respondents had two early events that are identified with their interest in amateur radio and SDL activities.

3. The most common first experience (14 of 20) that led to an abiding interest in amateur radio and associated lifelong learning was a micro experience.

4. Four respondents reported a meso event as their first experience.

5. Two respondents reported their first experience was a macro event.

6. All but one Low respondent reported having a micro event that is identified with their participation in amateur radio.

High Quartile

1. The most common birth year for this group, 1941, was a year in which the number of amateur radio operators who were born was well below the normal distribution.

2. All but one High respondent reported experiencing two or more events that are identified with their lifelong interest in amateur radio.

3. The most common first experience was a meso experience, with all High respondents reporting such an event.

4. Eighteen of the High respondents indicated a micro event was one of their initial experiences identified with an interest in amateur radio.

5. Seven of the High respondents indicated a meso event was one of their initial experiences identified with an interest in amateur radio.

6. High respondents generally experienced their first micro, meso, and macro event at a younger age than did Low respondents.

7. The SDLRS score SD for High respondents was smaller (7.64 vs. 12.68) than Low respondents.

The profiles of the two groups are striking in their contrast. The analysis of the interviews suggests that the age of the respondents at which they had certain experiences was different. High group respondents had their first experience that led to developing an interest in amateur radio at an earlier age than members of the Low group. While the types of experiences were similar, the sequence was different; whether the first experience was micro, meso, or macro. For the Low group the dominant first experience was micro. The dominant first experience was meso for the High group, and it was often reinforced with a micro experience at about the same time.

Conclusions

It is assumed that amateur radio operators comprise a select group based on their SDLRS scores, which are above the normal mean reported by Guglielmino (1977). It is also assumed that SDLR as measured by the SDLRS is developmental. Therefore information about amateur radio operator's and their adoption of amateur radio as a hobby might aid in exploring the development of SDLR development. While the above assumptions seem to be valid, this research indicates that the development of SDLR might be more complex then assumed. While this inquiry identified interesting associations between SDLRS scores and a variety of social variables including micro, meso, and macro social/cultural phenomena: it was not able to identify the potential interaction of genetic and psychological variables. Furthermore, it was assumed that the development of SDLR is associated with major macro events such as the Great Depression and major wars of the current century, these phenomena were not identified by the amateur radio operators interviewed. In order to maintain the position that these macro events are, in reality, associated with the development of SDLR it must be posited that major macro events, in some way, have subtle psychological affects and/or they are associated with other socio-cultural beliefs and practices such as general life style and concepts of personal responsibility. These phenomena can influence one's world view while not being explicitly identified with conspicuous phenomena such as the Great Depression or wars. It is also likely that the beliefs, attitudes and values of parents formed a generation earlier than the developmental age of their children may be more directly associated with an earlier time period. While parenting procedures and nurturing attributes are believed to be socio-cultural in nature, the relationship of these variables with the development of SDLR has not been examined in this study. Cloud (1992) found an association between parents' and children's SDLRS scores, but she was unable to fully explain the nature - nurture phenomena.

Consequently, the absence of the Great Depression in the respondent interviews does not directly negate the influence of adults who lived through it on children who escaped it. As a result children have both direct and indirect experience that may influence them. Whether it is possible to definitively explain the development of SDLR by time periods as brief as a few generations by macro events remains to be demonstrated. Despite this intermediate conclusion some of the following conclusions may eventually contribute to a better explanation for the development of SDLR.

Four conclusions emerged from this investigation:

1. Self-directed learning readiness as measured by Guglielmino's SDLRS is associated, in the sample studied, with being an amateur radio operator, sex, educational level, preference to study alone, number of hobbies, and occupation.

2. Historical events, whether micro, meso, or macro are associated with developing an interest in amateur radio, and thus by definition demonstrating high SDL. The interaction of these experiences, the age of the respondent, and the importance of the larger macro cultural framework in the development of high SDLR is unclear.

3. Respondents in the High group tended to be younger when they developed an interest in amateur radio.

4. The explanation for the association between historical events, whether micro, meso, or macro and adult self-directed learning readiness is complex.

Specific Conclusions for this sample

1. There is an association between being an amateur radio operator and SDLRS scores.

2. There is no association between SDLRS scores and sex.

3. There is no association between SDLRS scores and age.

4. There is an association between SDLRS scores and educational level.

5. There is no association between SDLRS scores and class of amateur radio license.

6. There is an association between SDLRS score and one's self-assessment of whether one prefers to study alone or in a group.

7. There is no association between SDLRS score and one's self-assessment of whether they are self-directed learners.

8. There is no association between SDLRS scores and the number of amateur radio operators in a family.

9. There is an association between SDLRS scores and number of hobbies.

10. There is an association between SDLRS scores and occupation.

11. Support was found for the conclusion that there may be an association between historical events and the development of SDLR.

Implications

The research question and the qualitative information have interesting implications for parents, community leaders, educators and those involved in the field of adult and child development.

Micro Environment

The micro environment was important to both the Low and the High groups' development of an interest in amateur radio. The research implies that the kind of experiences children have in the home can influence their adult level of SDLR as evidenced by the kind of lifelong learning they become involved in. A supportive learning environment in the home can have an impact on an individual's adult self-directed learning readiness.

Providing a child with an educational toy, or construction project such as a crystal radio set can have a lasting impact on their interest in technical subjects. An adult simply telling a child about such a device, and the experience of building it can be of importance,

also. Providing children with the opportunity to explore the world around them through such isolated activities, such as listening to a shortwave radio alone late into the night, or investigating the possibility of building an electronic device can each contribute to development as lifelong learners and higher levels of adult self-directed learning.

Parental support of a child's developing interest is also important. Children should be provided with encouragement as they pursue isolated learning projects. Whether they engage in learning with a friend or alone, parental support, whether active or passive, is essential. Active support may involve providing transportation to and from clubs, groups, libraries and stores, or it may include gift selections that feed a child's growing interest in a subject. It could be passive support such as allowing children to engage in play with a friend that involves learning. Examples from the interviews include stringing wire between rooms in a house to practice Morse Code or sharing a family radio to audit shortwave bands.

Siblings can also play an important role in the development of a lifelong interest in a hobby such as amateur radio that requires high self-directed learning. Two examples from the interviews from the Low group illustrated the importance an older sibling in encouraging self-directed learning. In both cases an older brother became a role model, served as a mentor, and led in the learning experience.

Meso Environment

Meso events were present in the development of High group respondents in all cases. Meso events were also important in the development of the Low group. The research implies that the kind of experiences children have with their friends and in their immediate community (school, church, and clubs) can influence their adult level of SDLR as evidenced by their participation in amateur radio. Clubs that provide a supportive learning environment may be the most important component for some individuals in developing a lifelong learning interest. The most common meso experience involved

learning projects leading to acquiring merit badges in the Boy Scouts. The second most common experience reported in the interviews was having a close friend with whom the initial experiences leading to an interest in amateur radio were shared.

Sharing an interest in amateur radio with a circle of friends was a common occurrence for the members of the Low group as they acquired their amateur radio licenses as adults. Members of the High group, while all reported meso events that contributed to the interest in amateur radio, often actually pursued their hobby in isolation. When they were involved in a group, often they reported themselves as the leader.

Macro Environment

Macro events were the least often reported experience that respondents identified as associated with becoming interested in amateur radio. Typically they followed either a micro or a meso event. The most common macro event was the introduction of technology, such as a crystal radio set. The second most common macro event reported by respondents was an interest in listening to foreign broadcasts on the shortwave bands. The inspection of the histogram of the age of amateur radio operators, however, and the points below and above the normal distribution that can be identified with historical event supports the notion that macro events may be an important experiential factor associated with the development of SDLR.

These types of events, however, do not appear to lend themselves to control by parents and educators. It should be remembered that the two most reported types of macro events, the introductions of technology and access to experiencing shortwave listening, are both helped by parents and/or educators.

Summary of Micro, Meso, and Macro Events

Events appear to be influential in the development of an interest in amateur radio when experienced in combination with each other, or at least sequentially. Micro events were more often the first experience for Low group respondents. Meso events were more

often the first experience for High group respondents. Macro events were reported more often by the High respondents than by the low respondents. Macro events, beyond the introduction of technology, such as war or depression might be associated with the development of SDLR, as evidenced by a fluctuation in the number of amateur radio operators by birth year, and other events.

Hypotheses

Two major hypothesis suggested by the findings and conclusions are as follows:

1. The kinds of experiences encountered by a child are associated with adult SDLR.

2. The kind of macro social climate that exists during childhood is associated with the development of adult SDLR.

The results provide some empirical support for the theoretical position that some experiences, between about ages 8 to 16, may be associated with adult SDLR. The nature of the findings would suggest that the next step would be to isolate the birth years associated with higher and lower than normal numbers of amateur radio operators. Then determine the mean SDLRS score for the peaks and valleys to determine if SDLR also varies.

Additional Questions Generated by the Study

1. Do macro events, such as war and depression, decrease the number of individuals that act in a high self-directed manner?

2. Do macro events, such as war and depression, contribute in some way to individuals becoming high in SDLR?

3. How is exposure to micro, meso, or macro events during one's youth associated with an increase in adult SDLR?

Suggestions for Further Study

Consideration of the results of this study within the context of existing research suggests several avenues for further study.

1. Further study could be used with a different hobby population, such as amateur astronomers, as a verification study.

2. A similar study could be conducted using amateur radio operators not drawn from all over the nation, but rather, from a single geographical area.

3. A similar study could be conducted on a random selection of adults, not amateur radio operators.

References

Adenuga, T. (1991). Demographic and personal factors in predicting self-directedness in learning. In H. B. Long's (Ed.), Self-directed learning: Consensus and conflict (pp. 93-106). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education of the University of Oklahoma.

Aslanian, C. B., & Brickell, H. M. (1980). Americans in transition: Life changes as reasons for adult learning. New York: College Entrance Examination Board.

Bandura, A. (1986). Social foundations of thought and action: A Social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall, Inc..

Bonham, L. A. (1989). Self-directed orientation toward learning: A learning style. In H. B. Long (Ed.), Self-directed learning: Emerging theory and practice (pp. 13-42). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education of the University of Oklahoma.

Bonham, L. A. (1991). Guglielmino's Self-Directed Learning Readiness Scale: What does it measure? Adult Education Quarterly, 41(2), 92-99.

Brill, P. L., & Hayes, J. P. (1981). Taming your turmoil: Managing the transitions of adult life. Englewood Cliffs, NJ: Prentice-Hall.

Brookfield, S. M. (1984). Self-directed learning: A critique of research and theory. In Proceedings of the Twentieth Annual Adult Education Research Conference. Raleigh, NC, April 5-7.

Brookfield, S. M. (1988). Conceptual, methodological and practical ambiguities in self-directed learning. In H. B. Long and Associates (Eds.), Self-directed learning: Application and theory (pp. 11-38). Athens, GA: University of Georgia, Adult Education Department.

Brookfield, S. M. (1991). Foreword to P. C. Candy's Self-Direction for Lifelong Learning. Jossey-Bass, San Francisco, CA.

Brockett, R. G. (1985). Methodological and substantive issues in the measurement of self-directed learning readiness. Adult Education Quarterly, 36, 15-24.

Brockett, R. G., & Hiemstra, R. (1991). Self-direction in adult learning: Perspectives on theory, research and practice. New York: Routledge.

Caffarella, R. S., & O'Donnell, J. M. (1988). Research in self-directed learning: Past, present, and future trends. In H. B. Long and Associates (Eds.), Self-directed learning: Application and theory (pp. 39-64). Athens, GA: University of Georgia, Adult Education Department.

Candy, P. C. (1990). The transition from learner-control to autodiaxy: More than meets the eye. In H. B. Long (Ed.) Advances in research and practice in self-directed learning (pp. 9-46). Norman, OK: Research Center for Continuing Professional and Higher Education of the University of Oklahoma.

Candy, P. C. (1991). Self-Direction for lifelong learning. Jossey-Bass, San Francisco, CA.

Clark, M. C., & Wilson, A. L. (1991). Context and rationality in Mezirow's theory of Transformational Learning. Adult Education Quarterly, 41,(2), 75-91.

Cloud, D. L. (1992). Association of parent-child self-directed learning readiness: An exploratory study. Unpublished doctoral dissertation, University of Oklahoma, Norman.

Confessore, G. J. (1992). An introduction to self-directed learning. In G. J. Confessore and S. J. Confessore (Ed.) Guideposts to self-directed learning. King of Prussia, PA: Organization Design and Development, Inc..

Confessore, G. J., & Long, H. B. (1992). Abstracts of literature in self-directed learning 1983-1991. Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Confessore, G. J., Long, H. B., Redding, T. R. (1993). The status of self-directed learning literature, 1966-1991. In H. B. Long (Ed.), Emerging perspectives of self-directed learning (pp. 45-56). Norman, OK: Oklahoma Center for continuing Professional and Higher Education of the University of Oklahoma.

Cronbach, L. J. (1968). Psychological issues and recent curriculum reforms. In R. G. Kuhlen (Ed.) Studies in educational psychology (pp. 19-26). Waltham, MA: Blaisdell Publishing Co..

Cross, K. P. (1988). 10th printing. Adults as learners: Increasing participation and facilitating learning. Jossey-Bass, San Francisco, CA.

Curry, M. A. (1983). The analysis of self-directed learning characteristics in older adults engaged in formal learning in two settings. Dissertation Abstracts International, 44, (05A), p. 1293. (University Microfilms No. AAC83-21092).

Danis, C., & Tremblay, N. A. (1988). Autodidactic learning experiences: Questioning established adult learning principles. In H. B. Long and Associates (Eds.), Self-directed learning: Application and theory (pp. 171-197). Athens, GA: University of Georgia, Adult Education Department.

Dertouzos, M. L. (1991, September). Communications, computers and networks. New York, NY: Scientific American.

Durr, R., Guglielmino, L., & Guglielmino, P. (1994). Self-directed learning readiness and job performance at Motorola. In H. B. Long (Ed.) New ideas about self-directed learning (pp. 175-185). Norman, OK: Oklahoma Center for Continuing Professional and Higher Education of the University of Oklahoma.

Easterlin, R. A. (1980). Birth and fortune: The impact of numbers on personal welfare. Basic Books, New York.

Eisenman, G. (1988). Self-directed learning: A correlational study of 5th grade students, their parents and teachers. Doctoral dissertation, University of Georgia, 1988). Dissertation Abstracts International, 49/12A, 120.

Eisenman, G. (1990). Self-directed learning-a growth process. In H. B. Long (Ed.) Advances in research and practice in self-directed learning (pp. 93-122). Norman, OK: Research Center for Continuing Professional and Higher Education.

Field, L.D. (1989). An investigation into the structure and validity and reliability of Guglielmino's Self-Directed Learning Readiness Scale. Adult Education Quarterly, 39(3), 125-139.

Finestone, P. (1984). Construct validation of the Self-Directed Learning Readiness Scale. Unpublished doctoral dissertation, University of Toronto, Canada.

Flavell, J. H. (1963). The developmental psychology of Jean Piaget. D.Van Nostrand Co..

Flavell, J. H. (1970a). Cognitive changes in adulthood. In L. R. Goulet and P. B. Baltes (Eds.), Lifespan developmental psychology: Research and theory. New York: Academic Press.

Flavell, J. H. (1970b). The developmental psychology of Jean Piaget. Princeton, NJ: D. Van Nostrand Co..

Flavell, J. H. (1977). Cognitive development. Englewood Cliffs, NJ: Prentice-Hall, Inc..

Garrison, D. R. (1992). Critical thinking and self-directed learning in adult education: An analysis of responsibility and control issues. Adult Education Quarterly, 41, 136-148.

Godfrey, E. (1975). Self-directed people in organizations. Part 1. Industrial Training International, 10(2), 34-36.

Gore, A. (1991). Computers, networks and public policy: Infrastructure for the global village. Scientific American, Special Issue, September, 265 (3).

Guilford, J. P. (1968). The three faces of intellect. In R. G. Kuhlen (Ed.) Studies in educational psychology (pp. 59-70). Waltham, MA: Blaisdell Publishing Co..

Guglielmino, P. J., & Klatt, L. A. (1994). Self-directed learning readiness as a characteristic of the entrepreneur. In H. B. Long (Ed.) New ideas about self-directed learning (pp. 161-174). Norman, OK: Oklahoma Center for Continuing Professional and Higher Education of the University of Oklahoma.

Guglielmino, L. M. (1977). Development of the Self-Directed Learning Readiness Scale. Unpublished doctoral dissertation, University of Georgia, Athens.

Guglielmino, L. M. (1992). Familial relationships in readiness for self-directed learning. In H. B. Long (Ed.) Self-directed learning: Application and research (pp. 181-188). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education, University of Oklahoma.

Guglielmino, L. M. (1996). An examination of self-directed learning readiness and selected demographic variables of top female executives. In H. B. Long (Ed.) Current developments in self-directed learning (pp. 11-22). Norman, OK: Public Managers Center, College of Education, University of Oklahoma.

Guglielmino, L. M., & Guglielmino, P. J. (1988). Self-directed learning in business and industry: An information age imperative. H. B. Long & Associates, Self-directed learning: Application and theory (pp. 125-148). Athens, GA: University of Georgia.

Guglielmino, P. J., Guglielmino, L. M., & Long, H. B. (1987). Self-directed learning readiness and performance in the work place: Implications for business, industry, and higher education. Higher Education, 16(3), 303-17.

HamCall: U. S. And International. (1993). Mineral, VA: Buckmaster Publishing.

Harlow, H. F., Harlow, M. K., Rueping, R. R., & Mason, W. A. (1968). Maturation and increasing learning capability. In R. G. Kuhlen (Ed.) Studies in educational psychology (pp. 41-49). Waltham, MA: Blaisdell Publishing Co..

Hays, W. L. (1988). Statistics. Orlando, FL: Holt, Rinehart & Winston, Inc., The Dryden Press.

Hiemstra, R. (1988). Self-directed learning: Individualizing instruction. In H. B. Long and Associates (Eds.), Self-directed learning: Application and theory (pp. 99-124).

Houle, C. O. (1988, second printing), The inquiring mind. The University of Wisconsin Press.

Howard, M. M. (1985). Modeling a training and development system and employee motivation to learn. Unpublished doctoral dissertation, The University of Oklahoma, Norman.

Jarvis, P. (1985). The sociological perspectives on lifelong education and lifelong learning. Athens, GA: Adult Education Department on Lifelong Learning and Self-Direction in Learning including the Lifelong Learning Forum, University of Georgia.

Jarvis, P. (1986). The sociology of adult and continuing education (Reprint). Dover, NH: Croom Helm.

Jarvis, P. (1990). Self-directed learning and the theory of adult education. In H. B. Long (Ed.), Advances in research and practice in self-directed learning (pp. 47-65). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Jarvis, P. (1992). Free-will, freedom and self-directed learning. In H. B. Long (Ed.) Self-directed learning: Application and research. Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Jones, C. J. (1989). A study of the relationship of self-directed learning readiness to observable behavioral characteristics in an adult basic education program. Unpublished doctoral dissertation, University of Georgia, Athens.

Kasworm, C. E. (1983). Self-directed learning and lifespan development. International Journal of Lifelong Education, 2(1), 29-46.

Knowles, M. S. (1975). Self-directed learning: A guide for teachers. Chicago Press. Association Press.

Knowles, M. S. (1970). The modern practice of adult education: Andragogy versus pedagogy. New York: NY Association Press.

Knowles, M. S. (1991, February). Keynote presentation at the Fifth International Symposium on adult self-directed learning, University of Oklahoma, Norman, Oklahoma .

Kuhlen, R. G. (1968). Studies in educational psychology. Waltham, MA: Blaisdell Publishing Co..

Kurian, G. T. (1996). DATAPEDIA of the United States 1790-2000: America year by year. Lanham, MD: Bernan Press.

Langenbach, M., Vaughn, C., & Aagaard, L. (1994). An introduction to educational research. Needham Heights, MA: Allyn and Bacon, Simon & Schuster, Inc.

Lant, T. K., & Mezias, S. J. (1990). Managing discontinuous change: A simulation study of organizational learning and entrepreneurship. Strategic Management Journal, 11, 147-179.

Larkin, J. (1988). The reshaping of everyday life in the United States 1790-1840. Harper & Row Publishers, Inc..

Lawton Public School System (1992). Understanding outcome based education. Staff development course presented by T. R. Redding in the Lawton Community Education Program.

Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic inquiry. Newbury Park, CA: Sage Publishing.

Long, H. B. (1987). New perspectives on the education of adults in the United States. New York: Nicoles Publishing Co.

Long, H. B. (1988a). Foreword to the New Edition. In the 1988 edition of Cyril O. Houle's The inquiring mind. Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Long, H. B. (1988b). Self-directed learning reconsidered. In H. B. Long and Associates (Eds.), Self-directed learning: Application and theory (pp. 1-10). Athens, GA: University of Georgia, Adult Education Department.

Long, H. B. (1989a). Self-directed learning: Emerging theory and practice. In H. B. Long (Ed.) Self-directed learning: Emerging theory and practice (pp. 1-12). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Long, H. B. (1989b). Truth unguessed and yet to be discovered: A professional's self-directed learning. In H. B. Long (Ed.), Self-directed learning: Emerging theory and practice (pp. 125-135). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Long, H. B. (1990a). Understanding adult learners. In M. W. Galbraith (Ed.), Adult learning methods: A Guide for effective instruction (pp. 23-37). Malabar, FL: R. E. Krieger.

Long, H. B. (1990b). Peter the Great: A social-historical analysis of self-education principles. Annual Adult Education Research Conference (AERC) Proceedings, May 18-20, 1990, University of Georgia, pp. 130-134.

Long, H. B. (1991a). Evolution of a formal knowledge base. In J. M. Peters, P. Jarvis & Associates (Eds.), Adult education: Evolution and achievements in a developing field of study (pp. 66-96). San Francisco, CA: Jossey-Bass.

Long, H. B. (1991b). Preface to self-directed learning: Consensus and conflict. In H. B. Long (Ed.), Self-directed learning: Consensus and conflict (pp. ix-x). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Long, H. B. (1991c). Challenges in the study and practice of self-directed learning. In H. B. Long (Ed.), Self-directed learning: Consensus and conflict (pp. ix-x). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Long, H. B. (1992A, March). Personal communication as to the earliest appearance of the term self-directed learning in the literature.

Long, H. B. (1992b). Learning about self-directed learning. In H. B. Long (Ed.), Self-directed learning: Application and research (p. 1-8). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Long, H. B. (1993a). Self-directed learning knowledge: Some important issues. In H. B. Long (Ed.), Emerging perspectives of self-directed learning (pp. 1-9). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education of the University of Oklahoma.

Long, H. B. (1993b). Preface. In H. B. Long (Ed.), Emerging perspectives of self-directed learning (p. Ix). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education of the University of Oklahoma.

Long, H. B., & Agyekum, S. (1983). Guglielmino's Self-Directed Learning Readiness Scale: A validation study. Higher Education, 12, 77-87.

Long, H. B. & Barnes, K. (1995). Self-directed learning in nursing education. In H. B. Long and Associates (Eds.) New dimensions in self-directed learning (pp. 217-242). Norman, OK: Public Managers Center, College of Education, University of Oklahoma.

Long, H. B., & Confessore, G. J. (1992). Abstracts of literature in self-directed learning 1966-1982. Norman, OK: Oklahoma Center for Continuing Professional and Higher Education.

Long, H. B., & Redding, T. R. (1991). Self-directed learning. Dissertation Abstracts, 1966-1991. Norman, OK: Oklahoma Center for Continuing Professional and Higher Education.

Long, H. B., Redding, T. R., & Eisenman, G. (1993). Development of self-directed learning readiness: A longitudinal study. In H. B. Long (Ed.), Emerging perspectives of self-directed learning (pp. 9-25). Norman, OK: Oklahoma Center for Continuing Professional and Higher Education of the University of Oklahoma.

Long, H. B., Redding, T. R., & Eisenman, G. (1994). A longitudinal study: Social behavior and SDLRS scores. In H. B. Long (Ed.), New ideas about self-directed learning (pp. 39-57). Norman, OK: Oklahoma Center for Continuing Professional and Higher Education of the University of Oklahoma.

Long, H. B., Redding, T. R., & Eisenman, G. (1995). Longitudinal study of Self-Directed Learning Readiness: SDLRS scores at the 5th, 8th, and 11th Grades. In H. B. Long and Associates (Eds.) New dimensions in self-directed learning (pp. 23-37). Norman, OK: Public Managers Center, College of Education, University of Oklahoma.

Long, H. B., & Stubblefield, C. H. (1994). Childhood experiences as origins of Self-Directed Learning Readiness. In H. B. Long (Ed.), New ideas about self-directed learning (pp. 15-22). Norman, OK: Oklahoma Center for Continuing Professional and Higher Education of the University of Oklahoma.

Massey, M. E. (1979). The people puzzle: Understanding yourself and others. Reston, VA: Reston Publishing Company.

McCune, S. L., & Guglielmino, L. M. (1991). The validity generalization of Guglielmino's Self-Directed Learning Readiness Scale. In H. B. Long (Ed.), Self-directed learning: Consensus and conflict (pp. 147-154). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

McCune, S. L., & Garcia, G., Jr. (1989). A meta-analytic study of the relationship between adult self-direction in learning and psychological well-being: A review of the research from 1977-1987. In H. B. Long (Ed.), Self-directed learning: Emerging theory and practice (pp. 87-98). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Merriam, S. B., & Simpson, E. L. (1984). A guide to research for educators and trainers of adults. Malabar, FL: Krieger Publishing Company.

Mezirow, J. (1990). Fostering critical reflection in adulthood: A guide to transformative and emancipatory learning. San Francisco, CA: Jossey-Bass.

Mezirow, J. (1991). Transformation Theory and cultural context: A reply to Clark and Wilson. Adult Education Quarterly, 41(3), 188-192.

Middlemiss, M. A. (1987). Relationship of self-directed learning readiness and job characteristics to job satisfaction for professional nurses. Unpublished doctoral dissertation, Syracuse University.

Minium, E. W., & Clarke, R. B. (1982). Elements of statistical reasoning. NY: John Wiley & Sons.

Morris, S. S. (1997). Item analysis of Guglielmino's Self-Directed Learning Readiness Scale: Revisiting the issue of internal consistency. In H. B. Long and Associates (Eds.), Expanding horizons in self-directed learning (pp. 195-208). Norman, OK: Public Managers Center, College of Education, University of Oklahoma.

Mourad, S. A. (1979). Relationship of grade level, sex, and creativity to readiness for self-directed learning among intellectually gifted students. Dissertation Abstracts International, 40, 04A, p. 2002. (University Microfilms No. AAC79-23138)

NACB (1997). North American Listings, Radio Amateur Call Book, 1997. Radio Amateur Call Book. NY, NY: Watson-Guptill Publications, BPI Communications.

Piaget, J. (1952). The origins of intelligence in children. New York, NY: International University Press.

Pratt, D. D. (1988). Andragogy as a relational construct. Adult Educational Quarterly, 38,(3), pp. 160-172.

Redding, T. R. (1991). Spark-gap to space: A descriptive study of self-directed learning. In H. B. Long (Ed.), Self-directed learning: Consensus and conflict (pp. 155-176). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Redding, T. R., & Aagaard, L. (1991, February). A descriptive study of the construct of self-directed learning. Paper presentation at the Fifth International Symposium on Adult Self-Directed Learning, University of Oklahoma, Norman.

Redding, T. R., & Aagaard, L. (1992). A descriptive study of the construct of self-directed learning. In H. B. Long (Ed.), Self-directed learning: Application and research (pp. 147-162). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education, University of Oklahoma.

Rodin, J. (1990). Control by any other name: Definitions, concepts and processes. In J. Rodin, C. Schooler, K. W. Schaie (Eds.), Self-directedness: Cause and effects throughout the life course (pp. 19-50). Hillsdale, NJ: Lawerence Erlbaum Associates, Publishers.

Rousseau, J. (1911). êmile, translation by Barbara Foxley. Dent, London, England.

Rusk, R. R., & Scotland, J. (1979). Doctrines of the great educators. New York: St. Martin's Press.

Russell, J. M. (1990). Relationship among preference for educational structure, self-directed learning, instructional methods, and achievement. Journal of Professional Nursing, 6 (2), 86-93.

Sexton, C, A. (1985). A study of psychological factors related to assuming responsibility for work-related self-directed learning. Proceedings of the 4th Annual Midwest Research-to-Practice Conference in Adult Continuing Education, Ann Arbor, Michigan, Oct 10-11, 1985.

Schooler, C. (1990). Individualism and the historical and social-structural determinants of peoples concern over self-directedness and effacy. In J. Rodin, C. Schooler, & K. W. Schaie (Eds.), Self-directedness: Cause and effects throughout the life course (pp. 19-50). Hillsdale, NJ: Lawerence Erlbaum Associates, Publishers.

Smith, R. M. (1988). Improving the dissemination of knowledge about self-directedness in education. In H. B. Long and Associates (Eds.), Self-directed learning: Application and theory (pp. 149-167). Athens, GA: University of Georgia, Adult Education Department.

Spear, G. E. (1988). Beyond the organizing circumstances: A search for methodology for the study of self-directed learning. In H. B. Long & Associates (Ed.), Self-directed learning: Application and theory (pp. 199-222). Athens, GA: University of Georgia.

Spear, G. E., & Mocker, D. W. (1984, Fall). The organizing circumstance: Environmental determinants in self-directed learning. Adult Education Quarterly, 35(1), 1-10.

Stubblefield, C. H. (1992). Childhood experiences and adult self-directed learning. Unpublished doctoral dissertation, University of Oklahoma, Norman.

The New Encyclopedia Britannica. The University of Chicago, V 27, p. 370, 1987.

Toffler, A. (1970). Future shock, (63rd printing). Bantam, NY, New York.

Toffler, A. (1981). The third wave, (7th ed.). Bantam, NY, New York.

Tough, A. (1967). Learning without a teacher: A study of tasks and assistance during adult self-teaching projects. Toronto: Ontario Institute of Studies in Education.

Udwadia, F. E. (1990). Creativity and inovation in organizations: Two models and managerial implications. Technological Forecasting and Social Change, pp. 65-80.

West, R. F., & Bentley, E. L. (1989). Structural analysis of the Self-Directed Learning Readiness Scale: A confirmatory factor analysis using Lisrel modeling. In H. B. Long and Associates (Ed.), Advances in research and practice in self-directed learning (pp. 157-180). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

West, R. F., & Bentley, E. L. (1991). Relationships between scores on the Self-Directed Learning Readiness Scale, Oddi Continuing Learning Inventory and participation in continuing professional education. In H. B. Long (Ed.), Self-directed learning: Consensus and conflict (71-92). Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

White, R. W (1968). Motivation reconsidered: The concept of competence. In R. G. Kuhlen (Ed.) Studies in educational psychology (pp. 81-94. Waltham, MA: Blaisdell Publishing Co..

Wilson, R. W. (1992). B/STAT: Graphical and statistical software. Missisauga, Ontario, Canada.

Zemke, R. (1982). Self-directed learning: A must skill in the information age. Training(8), 28-30.

APPENDIX A

OFFICE OF RESEARCH ADMINISTRATION

The University of Oklahoma
Norman Campus

MEMORANDUM

TO: Jennifer Gourley, Curriculum Advisor
Graduate College

FROM: Karen M. Petry, Director *Karen M. Petry*
Office of Research Administration

DATE: September 2, 1997

SUBJECT: Verification of Approval for Use of Human Subjects
in Dissertation Research Project (98-002)

This is to confirm that Terrence R. Redding received approval from the Institutional Review Board, Norman Campus, on the study "Association of Historical Events and the Development of Self-Directed Learning Readiness of Amateur Radio Operators." Mr. Redding's application to the Institutional Review Board was reviewed and approved August 28, 1997 as an application that met the criteria for consideration under the exempt from Board review category.

Please contact me if you require any additional information regarding this approval.

cc: Terrence R. Redding
Dr. Huey B. Long
Dr. E. Laurette Taylor, Chair, IRB-NC