CANADIAN THESES

THÈSES CANADIENNES

NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30.

AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30.

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED

LA THÈSE A ÉTÉ MICROFILMÉE TELLE QUE NOUS L'AVONS REÇUE

The Relationship of Adults' Self-Directedness in Learning to the Cognitive Style of Field-Dependence-Independence: An Exploratory Investigation

Revital Tzuk

A Thesis

in

The Department

of

Education

Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Arts at
Concordia University
Montréal, Québec, Canada

December 1985

ISBN 0-315-30645-9

ABSTRACT

The Relationship of Adults' Self-Directedness in Learning to the Cognitive Style of Field-Dependence-Independence: An Exploratory Investigation

Revital Tzuk

This investigation addressed the assumption that adults are authentic self-directed learners. It was particularly concerned with the identification of a cognitive perspective regarding adults' self-directedness in learning. The major research question examined the relationship between self-directedness in learning and the field-dependence-independence cognitive style among adult students. The relationship between age, educational level, sex and type of subject matter studied and both these variables was also investigated. 215 students in four educational levels and in two distinct categories of subject matter participated in the study. Self-directedness in learning was measured through the Self-Directed Learning Readiness Scale and field-dependence-independence was determined by using the Group Embedded Figures Test. A Pearson correlation revealed a low but statistically significant positive correlation. Differences in field-dependence-independence according to sex, educational level and disciplinary area were also found. These suggest that assuming that all adults are highly self-directed and that self-directed learning is the best way to learn may put the field-dependent adult learner at a disadvantage. It is advised that adult educators consider program areas and individual differences in cognitive style and introduce self-directed learning methods gradually.

ACKNOWLEDGEMENTS

Doing a thesis research is an experience and challenge in self-directed learning. But self-directed learning does not necessarily imply learning in isolation. This self-directed learning endeavour has been for me a valuable personal and academic challenge, and a number of people contributed to making it a unique and cherished experience. They left their personal mark on this thesis.

This research was made possible by grants from FCAC and SSHRC.

215 students, and many administrators and professors devoted time and effort in order to enable me to gather the data for this study. Their willingness to help other students and beginning researchers and advance our theory of adult education is very much appreciated.

My thesis supervisor, Professor Joti Bhatnagar, devoted an immeasurable amount of time, dedicated an undying reservoir of patience and he introduced many helpful comments and rewarding challenges. To just say 'thank-you' would never measure the extent of my gratitude and appreciation for the rewarding learning and growth that have been my share throughout the long period as his thesis student. I complete this study with very special feelings of being blessed, enriched and very undeserving of his concern, support, cooperation and contribution.

Professor Ron Smith devoted many hours and much advice which helped bring this thesis investigation into completion. His assistance in clarifying methodological and operational

issues, solving problems and raising many interesting questions add very much to this thesis. His ongoing responsiveness and cooperation are invaluable to this thesis.

Professor Arpi Hamalian was my teacher in the Department of Education since I was an undergraduate student. Her concern, encouragement and support along the road have always been appreciated. Her many helpful comments have led me to focus more clearly on some important issues in this study.

Dr. Claudia Danis and Dr. Nicole Tremblay from the Department of Andragogie in Université de Montréal took a special interest in helping me accomplish my research undertaking. My gratitude to them is expressed for always willing to listen to questions and give advice and for their continuous encouragement. My involvement in research with GRAAME and my acceptance there as an equal member certainly helped me overcome the sense of isolation which often surrounds researchers in our field. The many interesting discussions with Jean-Pierre Theil, also from GRAAME, also helped in advancing my investigation.

Mrs. Marie Rolland Barker was the first to introduce me to the field of study of adult education. She was my teacher at the beginning of my studies, and encouraged me to continue my graduate studies at a very early stage. She remained my friend and was always interested in sharing my research experiences with me. She read my notes for this thesis at a very early phase, and with sincere interest contributed to clarifying some of the issues. I carry her concern and friendship into the future.

Dr. Chris Petersen had also helped me at the beginning of my studies. He introduced me to the construct of cognitive style and to research on adult learning. His help during that important phase is fondly remembered.

Two people contributed to typing this thesis - Mrs. Roslyn Yearwood and Mrs. Norma Digiglio. Their precision, punctuality, efficiency, patience and sense of commitment assisted greatly in completing this undertaking. My thanks are extended to them for their constant helpfulness and good will.

Two very special persons are not usually mentioned in one's acknowledgments. My father, Yogev, has set an example for me which is not always easily achieved. Thank you for your love of learning, and for your support. My mother, Nachmia, has always supported me. She has taken pride in my intellectual interests, and helped in completing this research. Thank you for the patience with many numbers and computer sheets and a daughter who was only demanding.

A very loved person departed from me while this thesis was nearing completion. The agony over loosing her could only be overcome through the knowledge that it is her love which helped me reach this day. What is good in this thesis I wish to dedicate to the loving memory of my grandmother - Chayah Vinogradsky-Smadar.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

LIST OF TABLES

Chapter I

INTRODUCTION

It has long been argued that our knowledge about adults' learning is insufficient. Therefore, the need for research in this area appears to be primary. The literature has particularly indicated the need for additional research on the characteristics of adult learners. (Birren & Woodruff, 1971; Cross, 1981; Dubin & Okun, 1973; Simpson, 1980; Simpson & Brenneke 1977). Within this broad context, one area that is of central concern to adult educators is generally referred to as Self-Directed Learning or SDL (cf. Cross, 1981; Mocker & Spear, 1982). According to Simpson (1980), research on self-directed learning should be helpful in better understanding how adults learn. Another area in which knowledge about adult learning in general and self-directed learning in particular is lacking is concerned with the relationship between learning and cognitive styles (CS). Therefore, it was suggested that adult education research needs to investigate cognitive styles (e.g., Brundage & Mackereacher, 1980; Cawly, Miller & Milligan, 1976; Simpson, 1980). Most specifically, several authors have identified the need for investigating cognitive styles (CS) in relation to SDL (e.g., Brundage & Mackereacher, 1980; Even, 1982; Hiemstra, 1980).

The Concept of Self-Directed Learning

Self-directed learning was proposed to represent both a means towards a goal and a goal in itself for all educational activities, institutional and non-institutional alike, at all levels of education (e.g., Dressel & Thompson, 1973; Glaser, 1977; Gibbons, Bailey, Comeau, Schmuck, Seymour and Wallace, 1980; Moore, 1980). In this context, the study of SDL may be justified by the need to prepare and assist individuals in accomodating to accelerating quantities of information in a rapidly changing world (e.g., Knowles, 1975; Rogers, 1969). Thus, the UNESCO committee which studied the world of education today and tomorrow declared that: "Self-learning, especially assisted self-learning, has irreplaceable value in any educational system" (Faure, Herra, Kaddoura, Lopes, Petrovski, Rahnema & Ward, 1972 p.209). Another justification for the study of SDL was forwarded by Martin (1984), who argued that because human learning in any context is mediated by cognitive operations and processes of learners, SDL may be viewed as subsuming many cognitive, meta cognitive and strategic responses that are assumed to be critical variables intervening between instruction and learning. Hence, an increased understanding of SDL will contribute to identifying these intervening variables and to our understanding of how learners design their learning and learn on their own. This information may later be utilized

by researchers and facilitators in developing instructional theories and designing methods of instruction which take into account how people tend to respond to their environment and learn.

In adult education, the concept of SDL has assumed a particularly central stance (Brookfield, 1985a, 1985b). Mezirow (1981) has stated that "it is almost universally recognized, at least in theory, that central to the adult educator's function is a goal and a method of self-directed learning" (p. 21). In addition, Knowles (1975) has stated that "self-directed learning is the best way to learn" (p.10). He has argued further that SDL "is more in tune with our natural process of psychological development," for "as we grow and mature we develop an increasingly deep psychological need to be independent, first of parental control, and then, later, of control by teachers and other adults" (p. 14). However, despite its apparent centrality in adult education, and perhaps because of the various meanings assigned to it, SDL appears to be surrounded with confusion as to its precise nature, definition, connotations, boundaries and conceptual foundations (e.g., Brookfield, 1984; Chêne, 1973; Dressel & Thompson, 1973; Guglielmino, 1977; Kasworm, 1983a; 1983b, Pratt, 1984). Guglielmino (1977), for example, noted the use of the term in describing many behaviours. She also observed that "references to self-directed learning can be found under many labels" (p.7). Such labels may include "self-teaching"

(Tough, 1967), "self-planned learning projects" (Penland, 1977), "Independent study" (Brookfield, 1980, 1981, 1983; Houle, 1972; Moore, 1976, 1980), "self-education" (Darkenwald & Merriam, 1982), "autonomous learning" (Moore, 1976) "self instruction" (Martin, 1984), and "self-directed learning" (Knowles, 1975; Mocker & Spear, 1982). Moreover, at times these terms appear to be used interchangeably in referring to the same idea, (e.g., Brookfield, 1982), and in other instances the same term implies a slightly different meaning (cf., Houle, 1972; Moore, 1976, 1980). The concept also refers to many settings, educational contexts and programs (e.g., Harrison, 1978; Chêne, 1983; Guglielmino, 1977, 1978; Mocker and Spear, 1982; Moore, 1976, 1980). Nevertheless, on the basis of their review of the literature, Mocker & Spear (1982) concluded that there is a growing trend in the use of the term self-directed learning (SDL), and that this term "seems most likely to dominate in the future" (p. 11).

Even though the literature suggests great disparity in the approaches to SDL, certain common features nonetheless emerge (cf. Candy, 1985b). SDL does not necessarily mean learning in isolation, and it appears to refer to all fields of activity rather than to any specific domain (Brookfield, 1984; Hiemstra, 1980). Thus, the construct covers the entire educational process, in all settings. Essentially, the concept of SDL appears to describe educational experiences and processes in which external initiative and

instruction are absent, incomplete or indirect to some degree. (cf., Knowles, 1975; Martin, 1984; Moore, 1976, 1980, Thesaurus of ERIC Descriptors, 1982; Titmus, Butedahl, Ironside and Legrand, 1979; Tough, 1978, 1979, 1980). Thus, for the purpose of this study SDL could be defined as "educational activities in which initiative, planning, instruction or guidance which are external to the learner are incomplete, absent or indirect to some degree". These activities may range from situations of classroom directed instruction to self-planned and self-conducted learning projects in non-institutional settings, and to extramural programs. (cf., Brookfield, 1983; Guiglielmino, 1977; Moore, 1976).

Adults' Self-Directedness In Learning

Implicit in the discussion of SDL is the concept of self-directedness in learning as a personality variable. Self-directedness in learning refers to the ability of a learner to design conditions for and facilitate his/her own learning (cf. Guglielmino, 1977; Martin, 1984). It has been conceived as a dimension of individual attitudes and behaviours which determine whether or not SDL would take place in any given educational context (cf. Brockett, 1985b; Even, 1984; Fellenz, 1985; Guglielmino, 1977; Kasworm, 1983a, 1983b). For the purpose of this study, self-directedness in learning is therefore defined as "the extent to which individuals are capable of acting in a self-directed manner within any educational activity". There are, however,

some problems with and general concerns regarding adults' self-directedness in learning.

Although SDL is considered to be "a mode of learning characteristic to adulthood" (Mezirow, 1981, p.21), not all adults are capable of conducting SDL activities or want to be autonomous (e.g., Smith, 1982). Knowles (1978) himself noticed that "by and large, the adults we work with have not yet learnt to be self-directing inquirers" (p.52). Tough (1978) observed that "adults want additional help and competence in planning and guiding their learning" (p.260). Similarly, Moore (1980) noted that "adults are often fearful of being self-directed in educational transactions" (p.24). Knox (1977) observed that adults vary greatly in the extent to which they want to be self-directed, and Smith (1982) concluded that individuals differ in their requirements for structure in educational situations. In addition, Morstain (1974) and Smith (1982) appear to imply that it is possible that the nature of the subject matter to be learnt also relate to one's expectations and willingness to become engaged in SDL. Thus, in recent years adult educators have come to agree that not all adults are equally capable and ready for self-directed learning (e.g., Even, 1984; Guglielmino, 1977; Griffin, 1980). However, it is not yet clear which individuals would be more self-directed in learning, and why individual adults are different from each other in situations that call for self-direction in learning. Research on SDL has also not clarified whether there are any individual differences with

regard to the choice of any particular SDL approach, or in relation to any particular subject matter.

The Self-Directed Learning Readiness Scale

Motivated by a desire to describe, understand and find an answer to the question of differences in the capacity of adults to be self-directed in educational situations, Guglielmino (1977) observed that "although certain learning situations are more conducive to self-direction than others," there are some learner characteristics, including abilities, attitudes, and values which "ultimately determine whether self-directed learning will take place in a given learning situation" (p.37). Through the Self-Directed Learning Readiness Scale (SDLRS), which measures personal characteristics, skills and preferences associated with SDL, she contributed to operationalizing the concept of self-directedness in learning. Furthermore, these identified characteristics represent a recent concensus among experts on self-directedness in learning. Hence, this construct may be viewed as representing one of the dominant conceptions available to date regarding what constitutes self-directedness (cf. Brockett 1985a). It was found to discriminate between adults who manifest various degrees of self-directedness in various settings (e.g., Hassan, 1981; Savoie, 1979).

According to Guglielmino (1982), readiness to self-directed learning is somewhat normally distributed across the

adult population. Thus, individual characteristics and differences may be placed along a continuum, ranging from high to low levels of readiness to SDL. The development of the SDLRS promoted among adult educators a new awareness to the existence of individual differences in self-directedness. However, further research on readiness to SDL still appears to be needed.

The problems regarding self-directedness in learning outlined so far may be described as relating to two primary areas of research on adult learning - 1) the study of personality traits and individual differences in SDL 2) the development of a cognitive perspective on SDL. For example, Hiemstra (1980) pointed towards the need to know how individuals differ as self-directed learners. Mocker and Spear (1982) stated one of the current research questions which must be addressed by researchers as asking: "What are the personality characteristics that faciliate self-directed learning" (p.3). Finally, Kasworm (1983a) suggested that "in both the theory and its application, self-directed learning should be examined within a broader content, a framework which provides depth and breath of cognitive, behavioral and affective factors" (p.3). This recommendation has not yet been implemented, and further research in this direction must therefore be undertaken.

Cognitive Styles

The Construct of Cognitive Style

The Task Force on Needed Research in the Commission of

Professors of Adult Education recommended that research on adult learning focus on personal (internal) factors which affect behavioral change (Simpson & Brenneke, 1977). The construct of cognitive style (CS) appears to be most relevant as an element that refers to internal, personal factors. The nature and relevance of this construct are best expressed in the description of style provided by Anderson, Ball Murphy & Associates (1975):

> Cognitive styles appear to reflect consistencies in the manner or form of cognition, as distinct from the content of cognition or the level of cognitive skill displayed. Conceptualized as information processing habits that develop in harmony with underlying personality characteristics, cognitive styles appear in the form of stable preferences, attitude or habitual strategies which characterize a person's mode of perceiving, remembering, thinking and problem solving. As such, their influence extends to almost all human activities that implicate cognition, including social and interpersonal functioning. (p. 60)

Thus, the main strength of cognitive styles lies in the fact that they describe and conceptualize individual differences in learning and cognition, and hence have profound implications for teaching, training and educational theory (Messick, 1976, 1979, 1984). Because "adults differ from one another in how they learn, how they prefer to learn, and in their ability and capacity to be self-directing" (Griffin, 1980, p.501), research on CS appears to be relevant and may prove to add a significant contribution to our knowledge about SDL.

The literature identifies a wide variety of dimensions of CS. These reflect many different conceptual orientations and

methodological approaches (Kogan, 1971; Goldstein & Blackman, 1978). Kogan (1971) observed that these dimensions "vary considerably in theoretical heritage, extent of methodological refinement and demonstrated linkages to education" (p.245). However, the literature reveals several characteristics which are common to the various dimensions, and must be borne in mind. 1) Conceptualized to describe consistencies in the manner of cognition, cognitive styles do not refer to the content of cognition; 2) They are conceptualized as bipolar, whereby each extreme has different cognitive characteristics and each pole has qualities that are adaptive in different circumstances; 3) The adaptiveness of each pole to different circumstances renders CS as value neutral; 4) They cover diverse cognitive operations that cut across a broad domain of human behaviour; 5) As opposed to learning strategies, they are conceptualized as high-level heuristics that organize and influence a wide array of situations (Messick, 1976). Witkin (1978) asserted that the bipolarity and value neutral characteristics of CS are "undoubtedly their most distinctive features," because they make them distinguishable from abilities and "make it possible for cognitive style to serve adaptive ends" (p.29).

In addition to the fact that they reflect differences in perceptual and intellectual functioning, cognitive styles are also seen as interwoven with tempermental and motivational factors, and they indicate differences in social and inter-personal behavior as well (Messick, 1976, 1984). Moreover, "while styles have been looked at primarily in the context of

cognition, that is, as cognitive styles, they have always borne a heavy element of affect as well" (Wardel & Royce, 1978, pp.474-475). This coverage of a wide psychological territory offers information about many features of personality and areas of personal functioning which are beyond those represented by typical tests of ability and intelligence (Witkin, 1976). However, despite the fact that "research on cognitive styles has been going on for some twenty five years. . . ." for some reason it "has not been widely applied to educational problems" (Cross, 1976, p.112).

Field-Dependence-independence Dimension of Cognitive Style

Among the many dimensions of CS that are recognized by the psychological literature (e.g., Cross, 1976; Kirby, 1979; Kogan, 1971; Messick, 1976; 1979), the field-dependence-independence (FDI) dimension of CS "holds a substantial lead over any other dimension in the extent and quality of research" (Cross, 1976, p.116). Furthermore, this dimension was the most widely studied CS in relation to educational problems, and offers a wide range of guidelines for educational application (Witkin et al., 1977). For these reasons Pratt (1984) stressed that "amidst the flood of literature on learning style. . .a convincing body of evidence has established cognitive style, particularly Field Dependence Independence" (p.115) as a pattern of individual differences that may bear on questions of readiness for SDL and learning theory in adult education.

Witkin (1950,1952) and Witkin and his associates (Witkin, Dyke, Fatherson, Goodenough & Karp, 1974; Witkin, Hertzman, Machover, Meissner & Wappner, 1972; Witkin & Goodenough, 1981) developed the construct of field-dependence-independence (FDI) as a major dimension of cognitive style. Field-Independent (FI) individuals tend to rely on internal referents, whereas field-dependent (FD) individuals tend to be less autonomous and rely more on external referents. "Perhaps the most important characteristics of FD and FI persons described in the literature from the perspective of the most recent conceptualization of FDI were those related to the extent of autonomy manifested in both the cognitive and social domains" (Walker, 1981, p.42). Research evidence that has been accumulated since 1962 related individual differences in the extent of autonomy of external referents to these two broad areas of individual functioning. Witkin (1978), Witkin & Goodenough (1981) and Witkin, Goodenough & Oltman (1979) provided the most recent summaries and elaborations on this body of research. They pointed out that FI individuals manifest a greater degree of competence in cognitive restructuring, whereas FD individuals are more competent in interpersonal relations.

According to Witkin (1978), "restructuring may entail organizing a field which lacks inherent structure, imposing a different organization on the field than the one it contains, or breaking up an organized field so that its parts are rendered discrete from the ground" (p.22). In all these

tasks, an individual is required to make changes in the field or go beyond the information given. In these perceptual tasks and problem-solving situations, "the internal referents available to field-independent people provide them with a fund of mediating mechanisms" (p.22) that enable them to restructure a field rather than follow it as given.

Individual inclination to rely primarily on internal or external referents was also found to be evident in the social domain of personal functioning. Witkin & Goodenough (1977) reviewed the literature available on this aspect and concluded that:

> Experience of one's own self as separate and distinct from that of others, and, with it, reliance on internal referents, are likely to make for autonomy in social relations. In contrast, a less delineated self and primary reliance on external referents limit personal autonomy. Whether internal or external referents are given greater emphasis affects, in turn, the individual's orientation toward the main source of external referents - other people. Specifically, we may expect reliance on external referents to be associated with a turning toward people orientation as a characteristic social stance. Such an orientation is likely to foster attention to information provided by other people and their activities, interest in involvement with others, and competence in social relations. (p.662)

Witkin (1978) suggested that FD and FI tendencies develop as an adaptive response to the demands of life situations on the one hand, and lead people to gravitate to situations that suit one's style on the other. Witkin & Goodenough (1981), however, commented that "the labels field-dependent and field-independent represent tendencies, varying in degrees of strength, to rely primarily on internal or external referents" (p.16) rather than two distinct

categories of people.

Field-Dependence-Independence and Self-Directedness in Learning

Perhaps because of the use of terms such as autonomy and independence in reference to SDL (cf. Boud, 1981; Chêne, 1983, Houle, 1972; Knowles, 1975, 1978; Moore, 1976 1980; Tough, 1967) and the distinction between analytical versus global or autonomous versus nonautonomous individuals in reference to FDI (e.g., Witkin & Goodenough, 1981; Witkin Moore, Goodenough & Cox, 1977), several adult educators have come to view greater self-directedness in learning as associated with greater field-independence. Thus, according to Moore (1976) "the personality charactertistics. . . attributed to the autonomous learner hold a central position in several psychological theories. . .of the various theories, Witkin's field-dependent independent continuum seemed especially relevant to the personality characteristics of autonomy" (p.70). Similarly, Even (1982) suggested that those individuals who are capable of adapting to educational situations that require a high degree of self-direction are perhaps highly FI individuals, whereas those individuals who encounter difficulties in adapting to self-directed educational situations may be viewed as highly FD individuals.

Realizing the centrality of SDL in adult education theory, Even (1982) further asked: "Is the adult education philosophy directed toward the field-

independent cognitive style? Have educators been biasing learning approaches toward field-independent students?" (p.16). A similar question was asked by Brundage & MacKereacher (1980), referring to learners in non-formal settings. They called for additional research regarding personal characteristics with particular attention to the need of FD individuals for interpersonal interaction. Not unlike them, but with reference to learners in formal settings, Pratt (1984), hypothesized that in order to be active and effective in adult educational situations that require individual and group self-directedness, adult learners must demonstrate skills in both cognitive restructuring and interpersonal interaction. However, most recently Brookfield (1985b) has hypothesized that at least in non-formal settings, self-directed learners may manifest a particular strength in FD competencies. All these assumptions appear to suggest that the nature of the SDL process in various settings, and the characteristics that facilitate self-directedness in learning are not clear.

The construct of FDI CS has been especially attractive for researchers of SDL for the following reasons: a) it is a process variable that describes how individuals process information: b) it represents a bipolar continuum along which individual differences may be observed; c) it describes individual differences in personality and cognition; d) it has been well established through research; and e) it calls attention to a broad array of educational implications and applications (Cross, 1976; Even, 1982;

Messick, 1976; Pratt, 1984; Witkin, 1976; Witkin et al., 1977). However, the existence, nature and extent of the relationship between FDI CS and current conceptions of self-directness has never been examined and verified by empirical research. Therefore, research aiming at the investigation of the relationship between adults' self-directedness in learning and FDI CS appears to be of primary importance.

The next chapter would review the literature on the relationship between adults' self-directedness in learning and FDI.

Chapter II

REVIEW OF RELATED RESEARCH

What can we learn from research about the characteristics of adult learners which are associated with greater self-directedness in learning? Has the research endeavour undertaken by adult educators so far identified particular personality traits which facilitate SDL or are associated with greater self-directedness? In particular, are there any specific FD or FI tendencies which may be relevant to the study and practice of SDL? Does the research literature indicates the need and provides a basis for the justification of an investigation into the relationship between self-directedness in learning and FDI among adults? Are there any specific dimensions of this relationship which must be closely examined? In an effort to answer these questions, this chapter reviews the research literature available on two issues: adults' self-directedness in learning on the one hand and the Field-Dependence-Independence dimension of cognitive style on the other. The purpose of this review is to identify what is known about each of these aspects within the realm of educational theory. Throughout, more specific problems that require further investigation are explored, and the most relevant research questions are identified.

Adults Self-Directedness in Learning

The research literature concerning adults' self-directedness in learning includes only a small number of studies, but is very difficult to organize. It spreads across a wide array of research methods, questions and instruments and a large variety of population samples. In order to achieve clarity and focus the review of the literature, this section has been divided into 3 main parts. 1) The traits associated with self-directedness in learning; 2) Empirical studies concerning self-directedness in learning and field-dependence-independence; 3) Related social and demographic variables. Throughout, the attempt is made to examine two major issues: a) the characteristics and traits which emerge as descriptive of the highly self-directed adult learner; b) the more specific clarification of the field-dependent or field-independent tendencies of highly self-directed learners. Specific problem areas are then highlighted, related variables are identified and the need for further research of the cognitive style construct of FDI is emphasized.

The Traits Associated With Adults' Self-Directedness in Learning

Self-Directedness and Field-Independence

The findings of one group of studies on adults' self-directedness in learning may be interpreted as suggesting that greater self-directedness is positively related to greater field-independence (cf. Brundage & Mackereacher,

1980; Even, 1982, 1984).

Fox & West (1983) conducted an investigation with medical students in which they were allowed to choose their own educational format. They observed that students who chose non-traditional approaches such as self-directed field-based study over structured teacher-directed lecture and reading format manifested greater personal autonomy, and were less impulsive and less anxious than their peers. This finding suggests an association between greater self-directedness in learning and autonomous personality, and perhaps some relationhip to greater FI. Similarly, Armstrong (1971) found that adults with low educational attainment who spent an average of 1121 hours in a year on independent learning projects viewed themselves as tenacious, independent, open to new experience and possessing high achievement motivation. Such descriptions may be viewed as indicating a high degree of field-independence (cf. Witkin & Goodenough, 1981). In contrast, learners who had averaged only 110 hours a year on projects described themselves as warm, friendly, conformists and resigned to their life situations. Some of these traits may be viewed as indicating greater field-dependence (cf. Witkin & Goodenough, 1981). Finally, Bigelow & Egbert (1968) measured the correlation between scores of the California Psychological Inventory and the levels of success and satisfaction from independent study in college courses. One relevant finding relates to the level of satisfaction from independent study, which was associated with

needs for social interaction. While no differences in personality were found between individuals who were successful in either independent study or traditional classrooms, individuals who enjoy and need social interaction tended to be less satisfied from the SDL experience. Hence, the possibility exists that some FD individuals, perhaps those who are less academically successful, may not succeed in achieving a higher degree of self-directedness in learning in SDL situations that call for isolation because of their stronger needs for sociability and social interaction. FI people require less interpersonal contact (Witkin & Goodenough, 1981) and are likely to be less affected by the absence of interpersonal contact, and might therefore be more self-directed in some situations than FD people.

The findings and conclusion drawn from the research of Armstrong (1971), Bigelow & Egbert (1968) and Fox & West (1983) are limited in several respects. First, no one of these studies included any specific measure of self-directedness in learning which would allow a definite conclusion about the personality variable of self-directedness in learning. Secondly, these studies did not address directly the construct of FDI. Third, the samples observed were very small.

Self-Directedness and Field-Dependence

The findings of the second group of studies on adults' self-directedness in learning may be interpreted as depicting

the highly self-directed learner as manifesting a particular strength in the competencies, orientation and approach to learning which are associated with greater field-dependence (cf. Brookfield, 1985b).

Theil (1984) investigated the learning styles of successful self-directed adults who achieved a level of expertise outside an educational institution in an area unrelated to their jobs. Measured on Kolb's inventory of learning style, he found that a little more than one half of these people (53.3%) were accommodators, who perform better when they use concrete experience and active experimentation. Their greatest strength lies in doing new things and they tend to excell in those situations that require adaptation to specific immediate circumstances. They also tend to solve problems in an intuitive, trial and error manner, and they rely heavily on other people for information. Conversely, they don't rely very heavily on their own analytic ability. All these appear to suggest some FD orientation (cf. Kirby, 1979). However these results are applicable to only 1/2 of the sample and do not permit generalization to the broad universe of self-directed adult learners. In addition, the study did not include an objective instrument which measures the learner's level of self-directedness in learning.

Similar findings about 10 adults were reported by Danis and Tremblay (1985), who after employing the same methodology, observed that self-directed

learners "proceed in a heuristic manner within a learning approach which they organize around intentions, redefine and specify without following any predetermined pattern" (p. 139). These adult learners "take advantage of any opportunity that random events may offer them in order to learn" (p. 139) and, thus, do not appear to be breaking a field into its elements and pre-plan a learning sequence in an analytic, more field-independent fashion. However, this study observed a very small sample of adult learners, it did not address the construct of FDI directly and it did not employ an instrument which measures self-directedness in learning. In addition, it must be noticed that the studies of both Theil (1984) and Danis & Tremblay (1985) investigated samples of learners who did not complete more than 12 or 13 years of schooling and are therefore limited to this population alone.

Self-Directedness, Field-Independence and Field-Independence

The third group of research studies on self-directedness may be viewed as suggesting that adults who are highly self-directed are neither highly field-dependent nor highly field-independent. Instead, they suggest that being a self-directed learner requires competence in both cognitive restructuring and interpersonal relations (cf. Pratt, 1984).

Gibbons et al. (1980) analyzed the biographies of a sample of self-educated people who lacked formal training beyond high school and became experts in a

socially accepted field of human activity. The findings indicate that these people may be viewed as highly FI, as they were found to be able to create their own structure, actively test hypotheses, internally motivated and capable of identifying their own direction (cf. Kirby, 1979; Walker, 1981). However, they were also found to follow experiential and situational paths to learning in a concrete rather than abstract fashion, which may be viewed as indicating greater FD tendencies (cf. Tootle, 1985). In addition to internalized control and self-awareness, which may be viewed as indicating greater FI tendencies, however, the self-educated experts were also found to be sensitive to others and not necessarily pre-plan the events in their learning, which indicates a greater FD orientations (cf. Kirby, 1979; Walker, 1981; Witkin et al., 1977).

Joining this study is the research of Even (1985) which also suggests that by and large, adults are not highly self-directed, but they are not necessarily interested in depending on teachers to a very large degree. Specifically, Even (1985) reported that adult graduate students preferred an educational environment in which both students and instructors participate in planning and conducting learning activities. If, indeed, adult learners are capable of participating and learning effectively in such an environment, this would necessitate some competence in cognitive restructuring and some competence in interpersonal relations.

The results of both studies are limited.

The information of biographies (Gibbons et al., 1981) may be subjective, where facts may be withheld, distorted or added by authors or informants. A research method which includes a preference questionnaire alone without a measure of actual performance and investigates graduate students alone (Even, 1985) is also limited. Finally, neither study addressed the investigation of FDI directly or used a measure of self-directedness in learning.

Personality Correlates of Readiness to Self-Directed Learning

The last group of studies on self-directedness in learning is concerned with the personality correlates of the Self-Directed Learning Readiness Scale.

As may be seen from the research reviewed so far on self-directedness in learning, very little information is available about the personality traits that facilitate SDL. In particular, no clear picture can be drawn from these studies about the FD or FI characteristics of self-directed learners, and the information available presents mixed evidence and does not provide any useful guidelines. In an effort to resolve this unclarity, a number of studies attempted to identify the range of personality traits and cognitive variables that are associated with self-directedness in learning as it has been defined by Guglielmino (1977). The review of this research appears to be particularly meaningful because Guglielmino's (1977) SDLRS has gained a concensus

among adult educators (Brockett, 1985a) and it had been found to significantly discriminate between learners who manifest various degrees of self-directedness in formal and non formal settings alike (e.g., Hassan, 1981; Savoie, 1979).

Several studies investigated the relationship between creativity, flexibility, originality and dogmatism and readiness to SDL. In studying 40 graduate students of adult education Torrance & Mourad (1978b) found positive correlations among adult students between readiness for SDL and several measures of originality, creative experiences and achievements, and ability to produce analogies. However, this study is limited because it observed only graduate students in adult education. Two other studies involving gifted students of elementary and high school age observed a correlation between verbal originality, fluency, creativity in learning and confidence of students in their abilities and skills for learning (Mourad, 1979; Torrance & Mourad, 1978a). Still, one must question whether the findings from a sample of children is relevant to adult education. Finally, one must note the significantly negative relationship between readiness for SDL and scores of dogmatism and agreement response that were observed among college students (Long & Agyekum, 1983, 1984). However, all these findings taken together do not provide a clear answer as to whether greater FD or FI are related to readiness to SDL.

Three other studies looked at the extent to which highly

self-directed learners are satisfied with their lives, view themselves as controlling their lives and conceive of themselves as valuable and effective individuals. These findings also do not present conclusive evidence regarding the relationship between self-directedness and FDI and thus suggest the need for additional research. Sabbaghian (1979) found a moderate positive relationship between readiness for self-directed learning and its various dimensions and the levels of self esteem among 77 adult students. She also found that adult students with a high degree of self esteem appear to be more interested in learning, tend to view themselves as effective and independent learners, are more creative people and they consider learning as a lifelong and beneficial process. These people have a high degree of self understanding and greater tolerance for risk, ambiguity and complexity in learning, and are therefore more likely to plan and direct the majority of their learning projects themselves than adults with a lower degree of self esteem. A higher degree of self esteem may also be associated with greater field-independence (e.g., Morable, 1983).

Sabbaghain (1979) also observed that highly self-directed learners considered themselves to be generally more effective in life than low self-directed individuals. This finding coincides with that of Skaggs (1981). She found that highly self-directed learners do not feel that their lives are controlled and affected by chance, but that they themselves control their

lives. Finally, Brockett (1983a) investigated the degree of life satisfaction of older adults and their readiness for SDL. He observed a low positive correlation between the two variables. This led to the conclusion that people who are high in life satisfaction are also likely to be high on self-directedness in learning. Conversely, it appears that a lower degree of self-directedness is associated with a lower degree of satisfaction from life, as well as a lower degree of self esteem and the lack of sense of controlling one's life. The extent to which these may be related to FD or FI, however, is unclear.

The last finding on readiness to SDL also does not bear directly on FDI CS, but nevertheless provides some information which appears to suggest that greater readiness to SDL may be positively related to greater field-independence. Wiley (1981, 1982) observed students in a nursing program who were divided into experimental and control groups. Only the experimental group was taught how to conduct a learning project following the format described by Tough (1971, 1979). The variable of preference for structure did not affect the readiness for SDL of students. However, what seems significant is that it appeared to influence the reaction of learners in the experimental group to the SDL experience. Specifically, those who had a low preference for structure gained in their readiness to SDL scores. Although not in a conclusive fashion, it also appeared that students who preferred high structure lost in readiness to SDL during the experience.

This led Wiley to conclude that "since preference for structure seems to influence learners' reactions to an SDL experience, it is recommended that learners be measured on their preference for structure"(p. 230). Furthermore, she recommended that "learners who prefer high structure may best be served through assistance in self-restructuring, as an added component to SDL instruction" (1982, pp. 230-231).

The strength of Wiley's findings lies in the fact that the study employed a more extensively validated measure of self-directedness in learning - Guglielmino's (1977) SDLRS - rather than a questionnaire designed for the purpose of one study. Furthermore, the findings of this study appear to support the suggestions of Smith (1982) that some, but not all individuals, prefer more structure in a learning situation and may therefore be less self-directed. Greater field-independence indicates a greater capability for restructuring. If indeed there is a high relationship between self-directedness and FI, the theory of FDI may be useful in lending additional support to Wiley's (1981, 1982) study and in providing practical guidelines for SDL practice.

The results of these studies must be interpreted with caution. In addition to the population biases, one must also note the unclear picture about field-dependence or field-independence in relation to readiness to SDL, and the absence of an investigation which has directly addressed the examination of the relationship

between these variables.

Self-Directedness and Type of Subject Matter

Although SDL does not refer to any particular field of study, one investigation indicates that the type of subject matter chosen for study must be investigated in relation to self-directedness. Morstain (1974) reported that more college students in physical sciences, engineering and other scientific fields were interested in formal, teacher-directed and structured courses than students in the social sciences, fine arts and humanities, who preferred self-directed, independent programs. While the former group is ususally more FI (Witkin et. al, 1977) the latter is usually characterized as FD. This observation appears to stand in contradiction to the assumption that relatively more FI individuals would prefer SDL formats (e.g., Brundage & Mackereacher, 1980; Pratt, 1984).

Mortain's (1974) research findings are tentative and represent only one institution. Furthermore, they reflect declared preferences, but not actual choices. They also do not reflect one's capacity to be engaged in SDL in actual situations. They do, however, raise the question of whether the type of subject matter pursued by a person bears any relationship to his/her attitudes towards and capacity to follow SDL. No other study on SDL has attempted to examine this relationship.

Empirical Studies Addressing Self-Directedness in Learning and Field-Dependence-Independence

Only three studies were found which dealt directly with both SDL and FDI. Their results appear to recommend the need for further research which addresses specifically the relationship between readiness for SDL on the one hand, and FDI on the other. Powell (1976) studied children in elementary school and found that "cognitive style, achievement and self concept do not predispose a student to select particular self-directed study option and are not good predictors of the amount of structure students desire" (1976, p.3383A). The findings of this study appear to challenge those of Fox & West (1983), which imply an association between greater personal autonomy (according to the Myers-Briggs Personality Inventory) and greater self-directedness. They also stand in contrast to the assumptions made by Even (1984) which suggest that greater FI may predict greater self-directedness. However, it must be noted that Powell (1976) employed a preference questionnaire designed for the purpose of that study alone. The validity of this questionnaire may be doubted, and it appears that a more widely recognized construct of self-directedness in learning, such as the SDLRS, must be used before conclusive generalizations are drawn. In addition, it is unclear whether the study of children may bear directly on adult education theory.

Simpson & Walker (1983) compared the reactions of FD

versus FI nursing students to their experience in an individualized, self paced and self-directed curriculum. They found that FD students need more external structure and direction. They also observed that FI students benefited more than FD students in increasing their competence in SDL from participation in the program. These findings appear to indicate that high self-directedness in learning may be associated with high field-independence. However, although it examined adult learners, the results of this investigation are limited in two respects. First, the study did not employ a measure which assessed individual differences in self-directedness. Secondly, it included a very small sample of students (22). However the qualitative data yielded by this exploratory investigation provide a direction for future research, and recommend the pursuit of a study addressing the examination of the relationship between self-directedness and FDI among adult students.

Moore (1976) attempted to clarify whether people who enroll in independent-study programs of distance education display particular personality characteristics. He was particulary interested in identifying differences in personality characteristics between students who enroll in two different kinds of independent study programs. He divided learners into FD and FI groups and expected learners in both programs to be more FI than the norm and manifest favorable attitudes to independent study. The results of his investigation are very confusing, for

he found different results regarding FDI CS of adult learners in the two programs of independent study, and contradictions between their attitudes and cognitive styles. These results make it difficult to conclude whether FDI is related to greater self-directedness. Thus, while FI individuals were only partially favorable towards independent study, more FD individuals were favourable toward independent study. In addition, people enrolled in a more unstructured autonomous program were more FD than those enrolled in a more structured correspondence program. Yet, in contrast to the expectation of the researcher, they were not more FD than the norm. These findings led Moore (1976) to conclude that the FDI construct does not meaningfully discriminate between people who do and do not choose to enroll in an autonomous versus a correspondence program specifically, and he recommended that the construct is not useful to reseachers of independent study. These results, however, cannot be accepted as definite and conclusive. First, the samples included a self-selected population of graduate students in adult education and all subjects were teachers. Secondly, the characteristics of the programs involved and the features which distinguish them from one another are unclear. Third, the attitude questionnaire used did not gain widely tested and acknowledged validity as the SDLRS. Moreover, it contained only a small number of items reflecting attitudes towards SDL.

These related primarily to the particular types of programs studied and reflected a definition of self-directedness in learning of a small group of graduate students, which has not relied on a concensus of experts in the field. Finally, the major research question of this study was not concerned with the identification of variables and characteristics that are associated with the concept self-directedness in general, but with the isolation of specific characteristics in relation to two specific programs and contexts. The literature on SDL in adult education, however, indicated that there is a general dimension of self-directedness in learning which may be observed regardless of specific program areas (e.g., Even, 1982, 1984; Guglielmino, 1977). This suggests that the relationship between any aspect of self-directedness and any possibly related variable must be studied while treating the data as continuous, rather than as dictomous or context specific. Yet, in Moore's study, data on both FDI cognitive style and self-directedness were not treated as continuous, and the degree of the relationship between these two dimensions could not be ascertained. Nevertheless, the broader direction implied by the studies of Moore (1976), Powell (1976)and Simpson & Walker (1983), namely, the need for the identification of a relationship between self-directedness in learning and the cognitive style of Field-Dependence-Independence may be worthwhile of further investigation.

Social and Demographic Variables

In outlining directions for future research, Guglielmino (1977) suggested the need for investigating, among other variables, the relationship between readiness for SDL and age, sex, and educational level. The need for the consideration of these variables has also emerged in studies of adult behavior because these variables may intervene or moderate the relationship between personality and adult behavior (Botwinick, 1978).

Age

Torrance & Mourad (1978b) and Mourad (1979) investigated the relationship between the level of individual readiness for SDL as defined by Guglielmino (1977) and age among gifted children. These results are encouraging in their general indication of an increase in the level of ability to act in a self-directed manner with increased age. However, because the study dealt with gifted children only, the results cannot be generalized to the general population of adult learners. Several other authors examined this issue among populations of adult students. Sabbaghian (1979) studied an adult population ranging from 25 years to 60 years. Using the SDLRS, these subjects were divided into young adults (25-35) and older adults (over 35). She concluded that age appears to be a significant variable in considering adult readiness to self-directed learning:

"....older adults have higher self images, greater creativity and initiative in learning, view learning as a lifelong process and are more self-directed than younger adult students" (p. 126). Similar results were obtained by Long & Agyekum (1984) who also used the SDLRS. Caffarella (1983) however, did not find the age of subjects to cause a statistically significant difference in the way they responded to Guglielmino's (1977) SDLRS.

One group of particular interest to adult educators is older adults. Hassan (1981, reported in Brockett, 1983) did not find major differences in SDLRS scores between scores of groups under 55 years and over 55 years. Similarly, Brockett (1982, 1983) observed that the age of older adults 60 years and over (mean age 78) was not related to readiness for SDL. He concluded that "growing older, in and of itself, neither limits nor enhances one's potential as a self-directed learner" (1983, p.18), thus indicating that the relationship between the two variables is not linear. However, Omen (cited in Smith, 1982) identified a contradictory trend. In studying 2800 community college students it was found that those over the age of twenty five preferred more direction than did their younger counterparts. The results of these studies taken together may be interpreted as indicating that increased age is associated with a decrease in self-directedness. However, it may also suggest that at a certain age people reach a plateau, and their level of

self-directedness does not increase. Nevertheless, it seems that definite conclusions regarding the relationship between self-directedness and age can not yet be drawn and that further research in this direction is needed.

Education

The literature on the psychology of adult learning suggests that the educational level attained by an individual must always be considered, and may possibly affect one's performance (e.g., Botwinick, 1978; Petersen, 1979). Contract learning may be viewed as a form of SDL. Lehman (1976) stated that individualized, contract learning method seems particularly well suited for the older, working, married adult who have graduated from college. Most of the studies conducted with SDLRS report a similar trend. Sabbaghian (1979) reported that "more educated adults have a greater capacity for self-direction in learning than less educated adult students" (p. 125). In addition, more educated adults were found to have a greater love of learning, creativity, initiative and self understanding. Similar findings were obtained by Long & Agyekum (1983, 1984). Finally, Hassan (1981) discovered that "adults' readiness for self-direction in learning does increase with advanced education to the point that prediction of readiness can be made" (p. 3839A).

Several other studies may be viewed as implying that

although there seems to be a relationship between education and self-directedness, individuals with less schooling can nevertheless be self-directed. They suggest, however that individuals may pursue a different learning approach that corresponds to the educational level they have attained. In addition, they put into question the applicability of current conceptions of SDL to all groups of adults. (cf. Brockett, 1983, 1984).

Brockett (1983) studied older adults who completed an average of 10.43 years of schooling. He found that these adults were self-directed, but pursued their learning efforts in a different manner, with more emphasis on experiential modes of learning and less emphasis on books and schooling oriented means. Brockett (1984b) later concluded that "SDLRS defines self-directed learning from a highly school and book oriented perspective" (p. 17), which could be inappropriate among adults who have completed relatively few years of schooling. Furthermore, on the basis of a review of the literature he concluded that "a great many adults of low educational attainment engage in self-directed learning" (p. 18), and suggested that these adults pursue self-directed learning in a different fashion, which is more concrete and experiential. Brockett's (1983, 1984b) conclusions are further supported by the findings of Theil (1984). Most of the subjects in his study have had 13 years or less of schooling. They tended to use a method of concrete experience, active experimentation and intuitive and trial and error problem solving, while relying heavily on other

people. Thus, a picture may be drawn in which less educated individuals follow a different, more FD oriented path when they conduct self-directed learning projects. Therefore, it is still unclear whether FD or FI traits facilitate, contribute, affect or relate in any way to degree of self-directedness of adult learners with different educational background.

Two questions thus emerge. First, it appears that the relationship between self-directedness in learning and education must be further investigated. A broad sample that compares self-directedness in learning among adult learners with a different amount of schooling and those engaged in study in different educational levels is necessary. Within this sample, an additional comparison must take place, which examines whether these individuals manifest a different approach to educational situations, or a different degree of field-dependence or independence.

Sex

Very few researchers attempted to identify differences in self-directedness between the sexes. Mourad (1979), who studied gifted children, found that males and females may differ in their responses to complexity, adventure and independence in learning, responsiblity, self-confidence and skills for learning which are some aspects of readiness to SDL. He also observed that males were inferior to females in complexity, adventure and independence in learning, but were superior in

responsibility for own learning. Among adult learners, Sabbaghian's (1979) findings suggested that females who responded to the SDLRS generally "have greater abilities to organize and direct their learning activities, are more creative, more eager to learn, and have higher self concepts than male adult students" (p.126). She further recommended that facilitators in learning experiences should pay attention to the variable of sex. This last generalization, however, did not consider the educational level of these women, and represents the findings of one study alone. Generally, sex differences in self-directedness among adults remain almost unexplored.

Conclusions and Identification of Questions for Research

On the basis of the literature reviewed on adults' self-directedness in learning several tentative conclusions may be drawn. The first group of conclusions is related to the social and demographic variables that are associated with self-directedness in learning. The literature does not allow a definite statement as to the nature of the relationship between self-directedness in learning, age and sex. The literature has also indicated that the educational level attained by an individual may intervene to affect his/her readiness for SDL (e.g., Brockett, 1983). Moreover, it appears that the process of SDL may entail different characteristics and cognitive

approaches depending on the educational level attained by the adults studied, and the research instruments employed (e.g., Brockett, 1984b; Theil, 1984). Evident is the lack of a design which compares the sexes, different age groups and individuals who attained different educational levels.

A second set of conclusions relates to research methodologies. The review of the literature disclosed a particular bias regarding the characterisitics of the populations studied. Many of the studies reviewed were conducted with samples of gifted children(e.g., Mourad, 1979; Torrance & Mourad, 1978b), students in areas related to the medical profession (e.g., Fox & West, 1983; Simpson & Walker, 1983; Skaggas, 1981; Wiley, 1981, 1982), or graduate students, primarily in adult education (e.g., Even, 1985; Moore, 1976; Torrance & Mourad, 1978b). Only a small number of studies observed populations of university students from program areas that are not related to medicine or adult education, or with adult populations that did not reach a university level in their formal education. Furthermore, Morstain's (1974) study presented confusing findings which suggest that attention may need to be given to the content or subject matter chosen for study and its relationship to SDL. Another observation regarding methodology is that the investigations reviewed represent a large variety of methodologies, each aiming at answering a different research question. This

feature of the research literature limits the conclusions which may be drawn regarding the nature and implication of evidence inherent in the results of each study respectively, and the results of them all together. Thus, our knowledge about the personal characteristics that are associated with self-directedness and the theoretical basis of SDL remain limited. Moreover, very few studies attempted to directly identify and question what are the personality characteristics that are related to or contribute to self-directedness in learning specifically among adults. Third, very few empirical investigations of self-directedness were conducted at all, and the samples observed were relatively small in size. The last conclusion concerning research methodology relates to present conceptions of SDL. Within many of the studies reviewed, and across various areas of SDL in institutional and non-institutional settings, one of the conceptions of self-directedness in learning that prevails and is recognized is that of Guglielmino (1977). Nevertheless, to date, most of our knowledge about self-directedness in learning is in the form of assumptions and theoretical discussions.

The third cluster of conclusions that the review of the literature supports is pertinent to findings about the personality traits of highly self-directed learners and their FD or FI tendencies. As the evidence from empirical research indicates, highly self-directed learners appear to be emotionally and socially independent

and self-confident, flexible and non dogmatic (e.g., Long & Agyekum, 1983, 1984; Fox & West, 1983; Sabbaghian, 1979; Skaggs, 1981). Preliminary but inconclusive evidence suggest that these individuals may have a low preference for structure (e.g., Fox & West, 1983; Wiley, 1981, 1982). Another group of traits describes these individuals as creative in unusual ways and capable of pursuing problem-solving in trial and error and intuitive manners rather than a systematic, analytic approach, while relying heavily on other people (cf. Theil, 1984; Danis & Tremblay, 1985 Torrance and Mourad, 1978a, 1978b). The findings regarding trial and error and intuitive manners, however, are unclear. Tough (1971) discovered some more educated self-directed learners who are systematic and analytic individuals. This raises the possibility of two processes of SDL or of a broader concept that combines both FD and FI modes of information processing. Thus, a conclusion about these characteristics is yet to be drawn. Correspondingly, the personal characteristics associated with sociability and social interaction are unclear. Theil (1984) discovered that some successful self-directed learners outside an educational institution tend to rely on others and probably possess skills in interpersonal interaction that are essential for their success. Similarly Bigelow & Egbert (1968) showed that at least in independent-study programs in colleges, those who have strong need for

social interaction find independent study unsatisfactory. Yet, in contrast to both studies, Moore (1976) observed that individuals enrolled in a structured correspondence education program are more FI than students in an unstructured program and these people may thus be viewed as requiring relatively less interpersonal contact.

The dearth of research about personality traits associated with and potentially contributing to individual readiness for SDL allows very few generalizations, but generates many questions. Clearly evident is the almost total lack of knowledge about cognitive characteristics and individual differences in cognition. The degree to which highly self-directed learners are FD or FI individuals remains unexplored. Therefore, it follows that the study of the cognitive characteristics that are related to self-directedness in learning must be undertaken.

Many studies have used Guglielmino's (1977) concept of self-directedness in learning. Still, the number of studies exploring the relationship between SDLRS and personality traits is very small. To date, no study has reported the relationship between self-directedness in learning as defined by Guglielmino (1977) and Field-Dependence-Independence. Therefore, the need emerges to undertake such an investigation. This direction offers three research questions:

a) Is there a relationship between self-directedness in learning as it is currently being conceived and the field dependence-independence dimension of cognitive style?

The second research question that emerges involves the various intervening variables such as age, sex and educational level of an individual. Broadly stated, this question may be presented as follows:

b) What are the social-demographic variables that operate to moderate or affect the relationship between self-directedness in learning and the field-dependence-independence dimension of cognitive styles?

Finally, the question may be asked regarding the effect of a subject matter on one's preference for SDL and the capacity of an individual to pursue SDL. In its most general form, it calls for asking the following question:

c) Is there any relationship between self-directedness in learning and the type of subject matter chosen for study?

Field-Dependence - Independence Dimension of Cognitive Style

The literature on Field-Dependence-Independence dimension of cognitive style provides ample evidence regarding the educational implications of this dimension. The relative position of a student on the FDI continuum and the characteristics associated with this position were found to influence how students learn, the academic and vocational choices of individuals with different cognitive styles, the way teachers teach and the way teachers and students interact (Cross, 1976; Witkin, 1976; Witkin et al, 1977). Research evidence available to date also provide information about specific areas of learning theory such as concept

attainment, structuring of learning situations, the effect of social reinforcement, learning of social material and choice of subject matter. In this section, the results of research are reviewed with an attempt to identify and examine their implications regarding the theoretical basis of self-directedness in learning. The review is divided in to two main sections: 1) Educational research on FDI; 2) Related social and demographic variables. Most of the research information available has been derived from studies with children and high-school age students. Therefore, this section will review available information, but will also attempt to highlight particularly those studies which were conducted with adults.

Educational Research on Field-Dependence-Independence

Perception and Concept Attainment

A high degree of readiness to SDL requires that learners are able to identify what they need to learn, figure out a way to learn something, not stick with the known way but experiment with other methods, be able to find the information they need, enjoy tracking down the answers to a question and to a large degree learn what they need on their own (Guglielmino, 1977, 1982). The literature on FDI CS, however, provides information related to these areas of self-directedness which suggests that relatively FD individuals may manifest a low degree of readiness to SDL. This information appears to be particularly relevant in

the areas of perception and concept attainment.

Concept attainment "is of particular concern to educators because of their interest in having students learn concepts rather than isolated facts" (Witkin et al., 1977, p. 26). In a typical task of concept attainment, researchers introduce a series of stimuli to subjects, and expect them to discriminate between examples and nonexamples of the concept they wish them to learn. Research on FDI found a difference between FD and FI individuals. One difference that has been observed is concerned with the nature of the cues provided and the way FD and FI people notice these cues. Whereas FI subjects tended to sample examples of a concept from the full array of cues, FD subjects tended to sample only those stimuli that were salient and easily noticeable. (Dickstein, 1968; Kirschenbaum, 1969). Thus, this responsiveness to the dominant arrangement in a field may sometimes impair the attainment of a concept on the part of FD students, and suggests that in order for them to learn new concepts, educators must present learners with stimuli which are easily noticable. Moreover, it was also found that when the salient stimuli are irrelevant to the concept, they affect the pace of learning. Consequently, FI people were found to learn a concept more rapidly than FD individuals when the salient cue was irrelevant to the definition of the concept. This suggests that the relevance of the salient cues to the concept to be learned must also be considered in presenting new material (Goodenough, 1976;

Witkin et al., 1977), and raises questions regarding the effectiveness of self-directed learning methods in facilitating the attainment of concepts which are surrounded by irrelevant information.

Research evidence also suggest that concept attainment among FD individuals appears to be related to the content of the material to be learned. The results of several investigations indicated that FD students learned better social material even if it was peripheral to the concepts to be learned (Adcock & Webbereley, 1971; Fitzgibbons, Goldberger & Eagle, 1965; Ruble & Nakamura, 1972). According to Goodenough (1976) this superiority may be attributed to the selective attention that FD people give to social material and social cues. What these findings suggest is that if FD individuals initiate and control their own learning, they may lead themselves to study material which is compatible with their cognitive style tendencies. It also offers the possibility that these individuals may be more self-directed only in areas which involve social content. The extent to which these learners may cope with greater self-direction in areas of knowledge which do not include social material, however, is unknown. Consequently, this information introduces the need to consider the particular type of subject matter studied within a study of FDI and SDL.

Another aspect related to concept attainment is the approach taken by FD and FI individuals towards the testing of hypothesis. The two approaches taken by learners in hypotheses testing are that of a participant and that of an

observer. Nebelkopf & Dryer (1973) found that in contrast to FI individuals, FD people tended to use a spectator approach. In this approach, rather than actively taking elements and testing a hypothesis, the individual observes the elements passively and allows them to provide an impression. However, when FD people are encouraged to use a participant approach, they tend to form hypotheses on the basis of salient cues (Goodenough, 1976; Witkin et al., 1977). Being a self-directed learner requires that an individual be actively engaged in initiating, controlling, or monitoring one, some or all aspects of the educational activity (e.g., Guglielmino, 1977). This may imply an active approach to testing hypotheses that learners may require to take at times. If this is the case, FD individuals may be at a disadvantage in situations that require self-direction in learning. These people may be less capable of self-directedness in educational activities than FI individuals.

Rule transfer is another aspect of concept attainment. The difference in the manner of transferring rules by FD and FI individuals may be viewed as suggesting that greater self-directedness in learning is associated with greater field-independence. Maloney (1981) found that FI university students in the electrical sciences were superior to FD students in what he called lateral transfer, in which a person was expected to apply a rule in a context which was different from the one in which it was first learned. These students were also

found to be superior to FD students at solving novel problems by combining two or more learned rules and generating their own and combination. These findings raise questions regarding the capacity of FD individuals who engage in SDL to transfer rules from one context to another and generate new rules. Even if this may eventually take place, the effectiveness and efficiency of the SDL approach may be questioned, at least at the beginning of a learning experience.

In conclusion, the research regarding perception, concept attainment and rule transfer indicates that FD students may be at a disadvantage in educational situations which call for self-direction in learning. Consequently, this information implies that greater field-independence may be associated with a greater capacity to act in a self-directed manner in educational situations, and perhaps with a higher degree of readiness to SDL. Subjected to an unorganized body of knowledge and wishing to arrange it and master it on one's own, these individuals may encounter many difficulties. If cues in the learning material or information provided by resource people are not properly arranged, do not avoid negative or irrelevant examples, do not call attention to the most relevant stimuli or require the transfer of rules, the FD individual may not be able to learn a chosen topic or it may take him/her a longer period of time. Furthermore, the literature also suggests that FD individuals find it particularly difficult to consider cues that are not relevant to their

experience and to transform cues which were useful in the formation of one concept and became irrelevant in another concept (Ohnmacht, 1966; Zawel, 1970; both cited in Witkin et al., 1977). This suggests that during SDL activities, FD adults may have difficulties in approaching a body of knowledge which is new to them or discarding irrelevant concepts when trying to learn a new subject matter. According to Guglielmino (1977), however, a high degree of readiness to SDL implies a capacity to deal with unfamiliar problems and be able to track down answers to new questions on one's own. Thus, the extent to which high FI is indeed related to greater self-directedness must be investigated.

Use of Mediators and Feedback

According to Guglielmino (1977, 1982), individuals who manifest a high degree of readiness to SDL do not have problems in understanding what they learn, they know when they need to learn more better than most people, and they do not necessarily require much feedback during learning experiences. Related to these is the use of mediators in learning. Generally, FDI theory suggests that if there is no inherent structure in the material to be learnt, greater difficulty in organizing the field is experienced by FD people (Witkin et al., 1977). The evidence of research in this particular area also appear to suggest that greater field-independence may be a necessary condition for coping with educational activities which require greater self-

direction. Flemming (1968, reported in Witkin et al., 1977) found that FD individuals had less difficulty in recalling lists of words when they were presented in an orderly sequence or some kind of a hierarchy, but they did not recall these words when no order was imposed on the list. Similarly, Telfer (1979) observed high school students and found that the use of advanced organizers facilitated learning among FD students but made no difference in learning among FI students. Hawks (1983) found that although not at a level of statistical significance, the use of graphic organizers tended to lessen the difference in achievement between FD and FI undergraduate students.

Studies of programmed instruction also confirm these observations. Schwen (1970) found that FI students learned and remembered better than FD students when a learning sequence was presented through a large unbroken unit. Nevertheless, when a program of small steps was presented, no difference in learning was found between FD and FI students. Research findings also suggest that FD individual may require more feedback during learning. Renzi (1974) observed that when taught to draw an ellipse from a programmed text, FD university students learned more effectively when they were provided with feedback than when feedback was absent. Confirming these observations is the qualitative study of Simpson & Walker (1983) which was conducted among adult nursing students. They found that FD students reported that they experienced difficulty with large units

of instruction which were to be learned in a limited time. The same students also expressed a need for more feedback during educational activities and a desire for flexible pacing. They also viewed repetition and reinforcement as essential for their learning. Walker (1981, 1982) also found that FD individuals require more external feedback. These findings, again, suggest that unless they choose appropriate methods and resources, human and non human alike, FD individuals may encounter difficulties in being self-directed learners. They also support the hypothesis that greater field-independence is positively related to greater self-directedness in learning. However, as will be shown in the preceding sections, evidence also exists to suggest that certain FD traits may also be instrumental in facilitating greater self-directedness in learning.

Reinforcement, Feedback and Structure in Learning Situations

Highly self-directed learners appear to be capable of making themselves do what they think they should, they feel responsible for their own learning and they are not deterred by difficult study (Guglielmino, 1977, 1982). These aspects of readiness to SDL appear to indicate little need for external reinforcement, a high degree of internal motivation and little need for external structure and guidance. According to the theory of FDI, however, FD and FI individuals differ in these respects.

According to several studies, FI people

learn more than FD individuals under conditions of intrinsic motivation. However, FD and FI students appear to learn as much when their goals are defined for them and rewards are offered by a teacher (Fitz, 1971; Paclisanu, 1970; Steinfeld, 1973). Two other investigations found that while both FD and FI learners learned well when external reinforcement was provided in the form of material reward or praise, FD children appeared to be more affected by criticism (negative reinforcement) than FI people(Konstadt & Forman, 1965; Fitz, 1971). Similarly, Hubner (1983) found that teacher adaptation to a child's CS was significantly related to student behavior, and concluded that "by placing field-dependent students in the more personal and structured contexts, teachers increased the likelihood of their positive behavior" (3083A). Several adult educators suggested that greater self-directedness in learning is associated with internal motivation and emotional independence (cf. Even, 1984; Dressel & Thompson, 1973; Guglielmino, 1977; Moore, 1976, 1980; Skager, 1978). If this is the case, it may be expected that relatively more self-directed adults are those who are more FI.

Highly self-directed learners do not expect a teacher to tell them what to learn or how to learn (Guglielmino, 1977, 1982). Similarly, the difference between FD and FI individuals in response to and desire for social interaction is also related to their need for the external structure that is provided in instructional activities. Martens (1976) found that FD community college subjects preferred courses

"where the teacher followed the outline and which were highly structured and where the teacher determined how the requirements would be met" (p. 13). Marchese (1977) studied 60 female community students in their first year of college. She reported that FD students learned better in high structure, whereas FI individuals learned better in low structure. The findings of Simpson & Walker (1983) appear to confirm these observations. These results suggest that field-independence is positively related to self-directedness.

Concrete Examples and Human Modelling

In contrast to the skill in cognitive restructuring and the impersonal orientation of FI students, FD individuals are characterized by special attentiveness to social cues, interpersonal orientation, alertness to social components in the learning environment and tendency to require more mediators, demonstrations and modelling in educational situations (Witkin et al., 1977). Research evidence show that FD people spent more time looking at the faces of other people (Konstadt & Forman, 1965; Ruble & Nakamura, 1972), and they even remembered the faces of those they interacted with better than FI individuals (Messick & Damarin, 1964; Nevill, 1971). This attentiveness to social cues was also seen in the fact that FD people were better able to remember verbal messages that included a social content (Eagle, Fitzgibbons & Goldberger, 1976; Eagle, Goldberger & Breitman, 1969;

Goldberger & Benedich, 1972). Studies by Koran, Snow & Mcdonald (1976, cited by Witkin et al., 1977), Candler (1976, cited by Witkin et al., 1977) and Rittner (1981) also indicate that FD individuals learn better when they are provided with explicit, concrete stimulus and examples, and when different tasks and behaviours are modeled for them by other people.

These findings suggest that concrete examples and human modeling behavior are especially effective with FD learners. They raise the question of whether FD individuals in SDL situations will be capable of mastering knowledge on their own when the resources they use lack concrete examples and /or do not involve human interaction. On the other hand, Danis & Tremblay (1985) and Theil (1984), found that some highly self-directed learners manifest a particular strength in deriving advice and information from other people and solving problems in a concrete fashion. It implies that if greater self-directedness is related to a greater capacity to collaborate with others, highly FD individuals may be viewed as highly self-directed in learning (cf. Brookfield, 1985b). It suggests that the extent to which the interpersonal orientation of highly self-directed learners is associated with their degree of self-directedness must be investigated.

Social interaction

Individuals who manifest a high degree of readiness to

SDL appear to be capable of learning on their own, without much interaction with others or constant guidance (Guglielmino, 1977). Differences between FD and FI students were also found in their preference to learn alone or with others and in their favoring methods in which different amounts of social interaction are provided as a part of the educational activity. Walker (1981, 1982) investigated nursing students in a community college and found that those who were more FD preferred group learning over individual learning. Loveall (1979, cited in Walker, 1981) investigated adults who prepared themselves to take the GED (General Education Development - a high school completion program) test. As a group, they tended toward FD and the majority of these students preferred to study with a group of other people. Only a small part expressed preference to work alone, and they were more FI than those who expressed a tendency to study with a group. A similar observation was made by Martens (1976) with regard to adult students of a non traditional age who tended to be FD. She reported that these students preferred classroom situations which stressed individual attention, group work and interaction with other students.

Evidence also exist to suggest that social interaction is desirable by academically successful FD individuals as well. Simpson (1981) interviewed graduate students in adult education and students in a GED program and found that

regardless of level, they reflected a general orientation toward affective aspects and interpersonal interaction. Most subjects found people to be the most important resources and facilitating agents. Finally, De Cosmo (1977) found that among adult students enrolled in evening classes, FI individuals preferred self-help guidance strategies, while FD subjects preferred strategies that involved individual consultation. Thus, if SDL involves learning in isolation, FD subjects are not likely to choose this process. However, if SDL also involves some skill and competence in interpersonal relations, relatively more self-directed individuals will demonstrate skills that are possessed by both FD and FI individuals (cf. Brookfield, 1985b; Pratt, 1984).

Type of subject matter

Previous research on FDI reveals that a relationship exists between CS tendencies of individuals and the type of subject matter chosen for study. The studies on concept attainment reviewed earlier have already demonstrated that FD individuals pay selective attention to the social content of the material learnt and prefer group learning situations. Research on academic and vocational choices among college and university students adds support to these observations, and provide evidence that the curricular area in which learners are involved must be taken into consideration when research and intervention are considered.

Although FD and FI students do not differ in overall achievement in college, research evidence accumulated throughout the years indicate that they differ in their selection of courses and vocational domains (Witkin, 1976). (Witkin et al., 1977, p. 43). A longitudinal study of 1,548 students (Witkin & Goodenough, 1981; Witkin, Moore, Oltman, Goodenough, Friedman, Owen & Raskin, 1977). found that field-dependent people tended to favour and choose vocational domains that are social in content, emphasize interpersonal relations and are limited in need for restructuring skills, such as elementary and early childhood education, nursing, the helping professions and the general social sciences. Field-independent individuals tended to favour mathematics, natural sciences and engineering, which require skills in cognitive restructuring, are not interpersonal in content, and their conduct does not depend particularly upon interpersonal relations.

Studies involving adult students of a non traditional age also found differences in the curricular choices of FD and FI individuals. Martens (1976) found that FD students preferred areas of academic major that involve social subjects, writing and discussion and did not like an analytical curriculum. De Cosmo (1977) observed 200 community college adult students and found that those enrolled in occupational programs were significantly more FD than those students who selected science or business - technical options. The implications for SDL

theory of these differences between FD and FI individuals in vocational and curricular choices have never been addressed by research. In particular, self-directedness in learning appears to be perceived by adult educators as a dimension of individual differences that is equally applicable to all subject matters, skill areas and levels of competence (cf. Brookfield, 1984; Guglielmino, 1977). Apparently, this perception contradicts the findings of FDI theory. Therefore, it appears that at least in studies that involve the FDI dimension of CS, the extent to which a particular subject matter is related to or affects self-directedness in learning must be considered. In the light of Morstain's (1974) confusing results about the relationship between preference for SDL and one's choice of a subject matter, such an approach appears to be desirable.

Social and Demographic Variables

Within the research literature pertinent to life-span developmental psychology, very little attention was devoted to the issue of cognitive styles. Furthermore, very little research has been concerned with the age period beyond young adulthood. Thus, within the context of a study on adult education these variables must also be investigated.

Age

Apparently "there is some confusion as to the correlation of age with cognitive style" (Kirby, 1979 p. 40). This confusion suggests that the variable of

age must be considered with any study on adult learning. The prevalent view about FDI CS was summarized by Cross (1976), who concluded that "there is a movement toward field-independence up to early adolescence, followed by a plateau and some move toward field dependence around the age of fifty. These age patterns seem to hold regardless of culture, but individuals show remarkable stability through life with respect to their relative position on the continuum" (p. 118). Adult educators such as Peterson & Eden (1981) seem to support these ideas, and especially the conclusion that greater FD is associated with advanced age. Similarly, Goldstein & Blackman (1978), who reviewed studies of geriatric populations concluded that: "... these data indicate that both advanced age and infirmity are associated with field-dependence" (p. 189). De Cosmo (1977) studied samples of adult students in a community college and also found that advanced age was associated with greater field-dependence. Conversely, Bertinot (1978) found that age did not predict performance on tests of FDI CS. Kogan (1973), however, has criticized the research methodologies and conclusions available on the relationship between age and cognitive style. He argued that the research findings which suggest a relationship between advanced age and greater field-dependence are limited, because other variables, such as intelligence, education and occupational involvement must also be considered and may be related to FDI among various age groups. Thus, it appears that much is

still unclear about the extent to which greater field-dependence or field-independence are related to age.

Education

A similar confusion with regard to the source of variation in cognitive style exists in relation to the educational attainment of adult learners. Several authors have suggested that the educational level attained by an individual may contribute to the development of his/her FI cognitive style. Kogan (1973) suggested that the greater FI of 30-39 years old individuals, when compared to 17 year old, may be attributed to the educational advantage of the older group. Kogan (1973) later compared the results of two other studies and stressed the possibility that education may be a variable affecting greater FI. The only adult educators who considered education as an important variable are Peterson & Eden (1981), who concluded that "persons with more formal education are likely to be field independent" (p. 60). These findings indicate the possible relationship between greater FI and educational attainment. They suggest that the variable of education must be considered in designing research on adult learning.

Sex

According to Kirby (1979) "When we look at correlations of cognitive style and sex, we find somewhat more consistent findings. Although style varies more within sex groups than between sexes,

still, females at all ages tended to be field dependent... more often than males" (p. 41). Cross (1976), however, observed that the greater field-dependence of women is not necessarily universal. According to Messick et al. (1976) and Witkin (1975) sex differences may be attributed to socialization and culture, and they appear to conclude that in Western culture, women have usually been socialized to be more FD. Finally, Witkin & Goodenough (1981) concluded that with regard to gender, differences in FDI scores are greater within groups than they are between groups. Whether female adult learners are more FD than male adult learners is therefore still unclear, and additional research is therefore needed.

Conclusion and Identifiction of Questions for Research

As was suggested by Cross (1976), Even (1982), Pratt (1984) and Witkin et al. (1977), the educational implications of the FDI theory are numerous, and their consideration within the framework of adult learning theory appears to be a worthwhile undertaking. More specifically, it appears that this body of knowledge may be especially helpful in yielding additional information regarding adults' self-directedness in learning.

Upon reviewing the research literature on FDI CS, the central feature that emerges is that of two major groups of characteristic tendencies and personality traits. One group is that of relatively FD individuals, whose strength lies in

the area of interpersonal relations. Another group is of relatively FI persons, who are more competent in cognitive restructuring. The research literature has demonstrated that each of these types of individuals learn in a different manner, and may require a different facilitative approach. It has also indicated that when structure is absent, and no individual attention is provided to them, FD learners may be at a disadvantage. Therefore, FD individuals may be unsuccessful in many SDL situations. Their strength, however, may lie in the fact that they can benefit more from using people as resources. They may, however, be attracted only to the learning of some content areas, particularly those which include social content or to contexts that emphasize interpersonal interaction. Thus, the review of research on FDI CS and learning provides three alternatives for the conception of self-directedness in learning. On the one hand, greater self-directedness in learning may be conceptualized as greater field-independence (cf. Brundage & Mackeracher, 1980; Even, 1982, 1984). This may then exclude FD individuals from being capable of exercising self-direction. On the other hand, greater self-directedness may be conceptualized as requiring skill in both cognitive restructuring and interpersonal relations. This conception of self-directedness may require strength in both FD and FI modes of processing information(cf. Pratt, 1984). The third direction offers that greater self-directedness implies a higher degree of competence in using people as

resources, employing trial and error strategy and generally following a situation as given in a field dependent manner (cf. Brookfield, 1985b; Danis & Tremblay, 1985; Theil, 1984).

Perhaps because of the absence of a clear theoretical framework that describes what is meant by self-directedness in learning, no investigation to date has provided a clear answer as to the nature of its relationship to FDI. These studies which are reported in the literature reflect limited methodologies and sample size characteristics. They appear to bear no direct evidence which may specifically augment our information about the degree of the relationship between these two variables, and they did not study self-directedness in learning as it is currently being conceived among a population of adult learners from a broad spectrum of educational levels and within a sample that compares the sexes and age groups. Despite the fact that a specific instrument was designed to discriminate between adults who manifest various degrees of readiness to SDL (Guglielmino, 1977), no study to date has undertaken the examination of the relationship between adults' self-directedness in learning and their cognitive style of field-dependence-independence. Hence, the most important research question that emerges is the following:

a) Among a population of adult learners, is there a relationship between readiness to self-directed learning and their cognitive style in the dimension of field-dependence-independence?

The need to answer this question is consistent with the meaning of findings of research which were identified both in

relation to SDL and FDI. Similarly, the research literature on FDI also indicates the need to further study and provide an answer to two additional questions:

b) What is the relationship between the subject matter area that is being studied and the adult learners' degree of FDI.

c) What is the relationship between age, sex, and educational attainment and the adult learners' degree of FDI.

Chapter III

RESEARCH DESIGN AND METHODOLOGY

The purpose of this chapter is to describe the research design and methodology which were followed in an attempt to answer the general research questions identified in the previous chapter. Also included are the definitions of terms which guided this methodology and basic characteristics of the sample recruited.

Definition of Terms

Because many concepts in the field of adult education imply more than one definition, and in order to avoid confusion and preserve a coherent conceptual framework, this study employed the following definitions:

Adult

"Any person who is no longer subject to compulsory school attendance in Quebec."

(Commission d'étude sur la formation des adultes, English version, 1982, p.7)

Adult Education

"The entire body of organized educational processes, whatever the content, level and method, whether formal or otherwise, whether they prolong or replace initial education in schools, colleges and universities as well as in apprenticeship, whereby persons regarded as adults by the society to which they belong develop their abilities,

enrich their knowledge, improve their technical or professional qualifications or turn them in a new direction and bring about changes in their attitude or behavior. . ."

(Titmus, et al., 1979, p.33)

Adult Learning

"The process by which adults acquire new knowledge and skills, develop new attitudes, and the factors, intellectual, biological and social, which influence these processes, with particular reference to those factors which differ from factors influencing the learning of children."

(Titmus et. al, 1979 p.34)

Age

The student's age in years to the nearest birthday at the time of data collection in this study.

Educational Activity

"Any organized and systematic activity whose sole or principal purpose is the acquisition or development of knowledge, skills and aptitude, and which requires a deliberate effort".

(Commission d'étude sur la formation des adultes, English version, 1982 p.7)

Cognitive Style

A hypothetical construct that involves the characteristic and consistent modes of functioning by which individuals organize and process information and experience.

(Messick, 1976 pp.4-5, 1984 pp.59-60)

Field-Dependence-Independence

One dimension of cognitive styles identified by Witkin et al. (1954), which is measured by the individual's score on the Group Embedded Figures Test (GEFT). Individuals whose scores fall toward the lower and higher ends of the continuum are considered Field-Dependent or Field-Independent respectively.

(Walker, 1981 p.13)

Self-Directed Learning

As it appears in the literature, self-directed learning refers to "Educational activities in which initiative, planning, instruction or guidance which are external to the learner are incomplete, absent or indirect to some degree". (e.g., Chêne, 1983; Guglielmino, 1977; Knowles, 1975; Mocker & Spear, 1982).

Self-Directedness in Learning

The extent to which individuals are capable of acting in a self-directed manner within an educational activity.

Self-Directed Learning Readiness

The level of self-directedness of an individual as it is described by Guglielmino's (1977) Self-Directed Learning Readiness scale (SDLRS).

Self-Direction in Learning

The extent to which self-directed learning behavior is

allowed in an educational activity.

Educational Level

The level of a course in CEGEP or University program.

Type of Subject Matter

The type of subject matter which is taught in the courses from which the participants in this study were recruited. There are two types of subject matter in this study:

1) Education and helping disciplines.

2) Natural sciences and mathematics.

Education and Helping Disciplines

One category of subject matter which is studied by participants in this investigation. In this type of subject matter emphasis is placed on interpersonal relations and the need for skills in cognitive restructuring is generally limited.

(Witkin, Moore et al., 1977)

Mathematics and Natural Sciences Disciplines

In this category of subject matter, emphasis is placed on cognitive restructuring skills, the content is not social in nature and the conduct does not depend primarily upon interpersonal relations.

(Witkin, Moore et al., 1977)

Specific Research Questions

In order to answer the research questions identified in the previous chapter, the following specific research questions were formulated.

a. Is there a relationship between self-directedness in learning and Field-Dependence-Independence (FDI) among adult students?

b. Is there a difference in self-directedness in learning between adult students from different educational levels?

c. Is there a difference in FDI between adult students from different educational levels?

d. Is there a difference in self-directedness in learning between adult students in courses in education and the helping disciplines and adult students in courses of mathematics and natural sciences?

e. Is there a difference in FDI between adult students in courses in education and the helping disciplines and adult students in courses of mathematics and natural sciences?

f. Is there a difference in self-directedness in learning between male and female adult students?

g. Is there a difference in FDI between male and female adult students?

h. Is there a difference in self-directedness in learning between adult students from different age groups?

j. Is there a difference in FDI between adult students from different age groups?

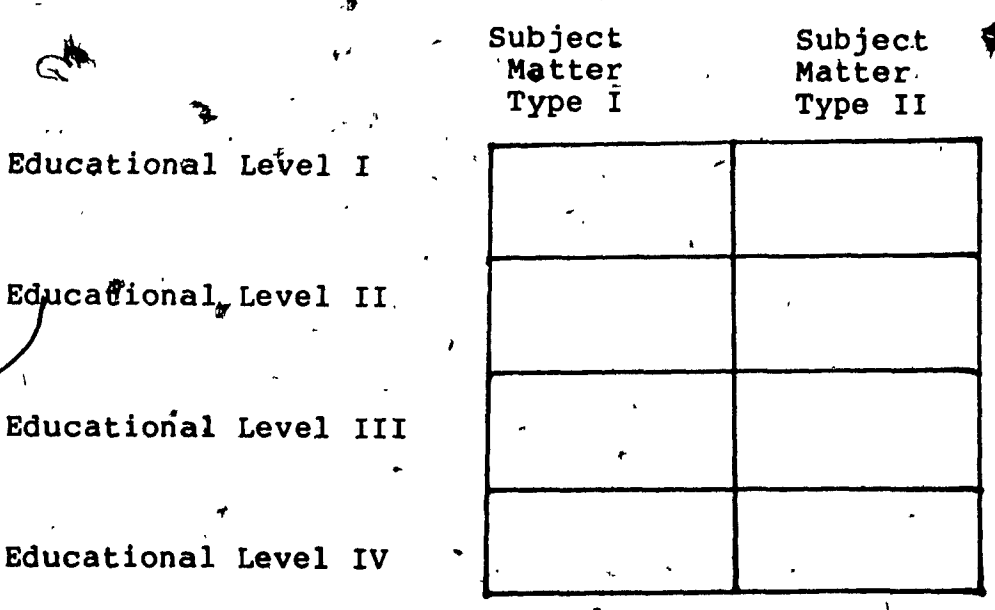
Research Design

In order to examine the relationship between self-directedness in learning and field-dependence-independence, it was concluded that a survey would be an appropriate procedure. The sample of adult learners to be surveyed must include adults studying in several educational levels. It

was decided that a sample of students from four educational levels, in institutions of post-secondary education and in equal numbers would suffice for the purpose of this exploratory investigation. This sample must also include adult learners from different age groups in equal proportions. It also needs to contain and equal number of men and women to ensure a balanced response to measures of both variables and to help in examining differences between the sexes. Finally, it was concluded that the sample must include an equal number of adult learners who attend courses in two distinct disciplinary areas: mathematics and the natural sciences (subject matter type I) and education and the helping professions (subject matter type II). It was hoped to obtain a sample of 25 people in each cell. Hence, the attempt was made to recruit 200 adult learners. Figure 3.1 describes the design of the study.

Figure 3.1

Research Design



Measurements

Self-Directedness in Learning

The degree of subjects' self-directedness in learning was measured through the Self-Directed Learning Readiness Scale or SDLRS (Guglielmino, 1977, 1982). A sample of this scale is presented in Appendix A.

The SDLRS is a self-report questionnaire that consists of 58 likert-type items. It was developed in order to identify the degree to which individuals perceive themselves as possessing the skills and attitudes that are associated with SDL. The items of this scale were determined on the basis of a Delphi survey of 14 leading experts on SDL.

In addition to a total score of readiness to SDL, the questionnaire also yields scores of eight factors in readiness for SDL. These are: 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; Ability to use Basic Study Skills and Problem Solving Skills. This study, intended to correlate both the total SDLRS score and the scores for each factor to FDI.

For the purpose of its administration, SDLRS requires that subjects fill the test form with a pencil. There is no time limit designated for filling this questionnaire.

During its development, Guglielmino (1977) administered the SDLRS to 307 subjects in Canada, Georgia and Virginia.

The scale was administered to adults from different educational backgrounds: High school, college undergraduates and individuals participating in non-credit enrichment courses. Students in both day and evening classes were represented, in a wide area of subject matters. On the basis of this information, it appears that SDLRS scores are normally distributed among the adult student population (Guglielmino, 1977; Guglielmino & Guglielmino 1982).

Using Cronbach Alfa co-efficient, the reliability of SDLRS was estimated at .87. Thus, the instrument could account for 76% of the variance in the effectiveness of individuals as self-directed learners (Guglielmino, 1977).

The construct validity of SDLRS was supported by several studies that were conducted since its development. Creativity is one aspect of behavior that characterizes individuals who are ready to engage in SDL. Torrance & Mourad (1978a) found a positive correlation between SDLRS and various measures of originality and creativity. A creativity measure that requires the description of images suggested by sounds yielded a correlation of .52 ($p < .001$). A Similes originality test was also correlated at .52 ($p < .001$), and a measure of thinking creatively about the future yielded a correlation of .38 ($p < .01$). In addition, a study of the relationship between SDLRS and creative achievements yielded a correlation of .71 ($p < .001$), and ability to use photo analogies revealed a correlation of .48 ($p < .001$).

Because readiness for SDL may imply independence in thought and action, Long & Agyekum (1983, 1984) studied the

correlations between SDLRS and measures of dogmatism and agreement response. These were found to correlate negatively with readiness to SDL. However, the figures supporting this conclusion were not reported. Similarly, Skaggs (1981) found a negative correlation between SDLRS scores and the expectation of subjects that chance controls one's life as was measured by Levenson's scale of Locus of Control. Again, no precise figures were reported.

Being self-directed in learning situations also implies a positive view about one's self, self confidence and a belief in one's ability to respond to the challenges of many situations in an independent manner (Guglielmino, 1977). Sabbaghian (1979) found a positive correlation between SDLRS and scores of the Tennessee Self Concept Scale (r =Ø.558). Similarly Skaggs (1981) found a positive correlation between SDLRS scores and subjects perception of internal control over events as measured by Levenson's scale of Locus of Control. Finally, Brockett (1982, 1983, 1985) found a correlation between the Salamon Conte Life Satisfaction in the Elderly scale and scores of SDLRS ($r = .24$; $p < .Ø5$).

As it appears from the research literature there has not been a sufficient number of validity studies of the SDLRS. In addition, the various correlations do not appear to be sufficiently high. However, the SDLRS is the only instrument available for discriminating between adults who manifest various degrees of self-directedness in learning. For this reason, and because of its acceptable

level of reliability and validity, SDLRS was selected for the purpose of the present study.

Field-Dependence-Independence

The level of field-dependence-independence of the adult students who participated in this study was measured through the Group Embedded Figures Test, or GEFT (Oltman, Raskin & Witkin, 1971). The GEFT measures FDI on a bipolar continuum. Individuals at either extreme of the continuum tend to manifest cognitive and social characteristics that are consistently different. A sample of this test is presented in Appendix B.

The GEFT test itself asks subjects to locate and outline a simple figure which is embedded within a geometric figure that is more complex. It consists of a booklet divided into 3 sections. The first section includes 7 figures that are provided for the purpose of practice. The second and third sections include 9 items each which are more difficult and constitute the test form itself. For purposes of its administration, the GEFT requires a pencil and a test booklet. The test is timed so that after an initial practice session subjects are given 10 minutes for response.

One problem with performance on embedded figures tasks is that practice or training may improve scores toward greater field-independence. Therefore, Goldstein & Blackman (1978) recommended that researchers should study naive subjects. An attempt was made in this investigation to verify whether subjects had already taken the GEFT by asking

them to mark an x on the test booklet in case they filled it in the past.

The norms established for the GEFT are based on a sample of men and women students in a liberal arts college. In this sample, men obtained slightly but significantly higher scores than women. However, Witkin, Oltman, Raskin & Karp (1971) stated that "these norms are strictly applicable only to individuals coming from populations similar to the group from which the norms were established. For other populations, they commonly serve as a general guideline" (p. 28).

The GEFT is one instrument within a series of measurements that were developed to assess FDI. Its original parent form was the Embedded Figures Test (EFT) for administration to individuals. Witkin et al. (1974) summarized and concluded the research on the reliability of these various measures, including the EFT. Goldstein & Blackman (1978), who reviewed the literature on various measures of FDI, concluded that "the reliabilities were satisfactory high, clustering in the high .80s to low .90s when tests were readministered at one week intervals" (p. 181).

The GEFT was developed on the basis of the Embedded Figures Test (EFT) in a series of tests that resulted in a final version. Its reliability was determined using correlations of section II and section III of the test. After the sections were correlated, they were corrected by the Spearman - Brown Prophecy Formula,

and produced a reliability estimate of .82 for males (n=80) and females (n=97) alike (Witkin et al., 1971).

The validity of the GEFT was established in several studies. In one study, subjects in one group were administered section II in a group form and section III individually. In a second study, section II was administered individually and section III was administered with a group test. The correlations between these two groups, corrected for reduced test length, yield results of -.63 (females) to -.82 (males). The scores should be negative because the two tests are scored in a reverse fashion. (Witkin et al., 1971). Witkin et al., (1971) concluded that these correlations are reasonaly high.

"A second measure for evaluating GEFT validity is the RFT which ". . . is itself a criterion measure of field-dependence-independence" (Witkin et al., 1971 p. 28). The correlations between these two tests were moderate: -.39 for male undergraduates and -.34 for female undergraduates. These scores should also be negative because the two tests are scored in a reverse fashion. Witkin et al. (1971) concluded that these particular correlations "fall toward the lower end of the range of correlations typically found between EFT and RFT" (p. 29). Finally, correlations of GEFT with a measure of Articulated Body Concept yielded substantial results: .71 for males and .55 for females (Witkin et al. 1971). These were viewed by Witkin et al. (1971) as substantial, particularly for males.

The information regarding the reliability and validity

of the GEFT appeared to be satisfactory, and suggested that the GEFT is a valid and reliable test. Moreover, among the various measures of FDI, this has been the most widely used instrument for administration to groups, and was found to be particularly useful for this investigation.

Age

The age of subjects in this study was identified through the Personal Background Information Form (a sample of this form is presented in appendix C). Subjects were asked to state their date, month and year of birth. For the purpose of scoring, the age of the subject was considered as their age in years to the nearest birthday at the time of data collection.

Sex

The sex of subject was also identified through their response to the Personal Background Information Form. (see Appendix C.)

Educational Level

The educational level attended by participants was determined according to the level of class in which he/she studied. There were four categories of educational level:

Level I - CEGEP

Level II - First year undergraduate

Level III - Advanced and third year undergraduate

Level IV - Graduate

Data were classified and organized according to these categories.

Number of schooling years.

The number of schooling years which subjects had completed was identified through the Personal Background Information Form.

Language

The first language of the subjects was identified through the Personal Background Information Form. (see Appendix C.)

Type of Subject Matter

There were two categories of subject matter in this study. These were determined according to the content that was taught in the classes included in this study. Thus the data in the study were organized according to these categories:

Type I : Education and helping disciplines

Type II : Mathematics and natural sciences

Recruitment of Subjects

1) A letter was sent to University and CEGEP professors, requesting them to allow their students to fill the required questionnaires during class time. A sample of

this letter is presented in Appendix E. In an attempt to recruit adult students of education and the helping disciplines (subject matter type I) and students of mathematics and the natural sciences (subject matter type II) across four educational levels, letters were mailed to professors in the following institutions and departments:

Concordia University

Certificate and B.A. :Adult Education; Applied Social Sciences.

B.Sc.: Mathematics.

Diploma, M.T.M and, M.Sc.: Mathematics.

McGill University

Faculty of Education: M.Ed. in Counselling

Champlain Regional College

Pre University Credit Courses in Mathematics and Psychology: Department of Continuing Education

Vanier College

Pre-Univeristy credit courses: Department of Mathematics

Diploma courses: Department of Special Care Counselling.

2) In addressing the professors in the various institutions, an attempt was made to specifically recruit students from courses at the following academic levels:

Level I: beginning CEGEP students

Level II: beginning undergraduate level students

Level III: last year or advanced undergraduate students

Level IV: graduate students

Thus, the letters were specifically addressed to those

professors who taught courses at these levels in each institution and in each program area.

3) Those professors who were contacted were asked to indicate their willingness to participate and designate a date for data collection.

4) Follow up calls were conducted two weeks after the delivery of letters.

5) Among those professors who agreed to participate, the researcher randomly selected one to three classes in subject matter type I and one to three classes in subject matter type II at each educational level. An effort was made to recruit at least 25 subjects in each subject area at each level. All together, 16 classes were recruited to participate in the study, with a total of 215 students.

Collection of Data

1) Upon arriving at the classes designated for data collection, there were four types of forms that each student was expected to fill out:

- Consent Form (Appendix D.)
- Personal Background Information (Appendix C.)
- Group Embedded Figures Test (Appendix B.)
- Self-Directed Learning Readiness Scale (Appendix A.)

2) It was explained to the students that a study about adult learning is being conducted. They were also informed that they do not have to provide

their name or any details that may lead to personal identification, such as student name, student I.D. number or social insurance number. This information will remain anonymous, and participants may have access to the results of the investigation if they wish at any given point in time.

3) At the next step, subjects were given a card with a number from 1 to 100 and were asked to write this number on all the forms that they would fill out.

4) In four out of the 16 classes visited, subjects were first asked to fill in the Consent Form, Personal Background Information Form, and then, in a random order, were administered the GEFT and the SDLRS in class.

However, in the other 12 classes, professors could only allow 20 minutes for this investigation. In these classes, students filled the Consent Form and the GEFT in class and these were collected immediately. They were then given the SDLRS and the Personal Background Information Form to fill out at home. These were later collected through the professor or sent by mail to the researcher.

5) Subjects were instructed about filling out the questionnaires as dictated by the manual for the GEFT and the SDLRS.

6) After filling out the GEFT, and before its collection, participants were asked to mark an x on the back of the test booklet in case they took this test before.

7) After all the questionnaires were collected, the data were scored according to the instructions provided by

the manual for the Embedded Figures Test (Witkin et al. 1971) and by Guglielmino (1977).

Sample

215 subjects were recruited and participated in this study. All of these subjects filled the consent form and the Group-Embedded Figures Test. However, only 160 subjects filled out and returned the Self-Directed Learning Readiness Scale and the Personal Background Information form as well. Table 3.1 presents descriptive statistics for the total study sample.

Table 3.1

Descriptive Statistics for Total Study Sample

	Age	No. of Years of Schooling Completed	Self-Directed Learning Readiness Score	Group Embedded Figures Test Score
Range	18-62	7-29	86-287	0-18
Mean	27.70	15	221.89	10.58
Median	23.69	14.91	226	11.44
Mode	20.00	12.00	243	16
Standard Deviation	9.72	2.74	28.43	5.39
N	161	161	160	215
Missing Data	54	54	55	0

The description of the total number of subjects who filled the GEFT and the SDLRS in each subject matter category is provided in table 3.2.

Table 3.2

The Number of Subjects Who Filled GEFT and SDLRS in Each Subject Matter Category and at Each Educational Level and Subject Matter Category

Category	SDLRS	GEFT
Total: Students of Education and Helping Professions	78	100
Total: Students of Mathematics	82	115
Total: Pre-University Students	54	79
Total: First Year University Students	39	37
Total: Advanced and Last Year University Students	34	50
Total: Graduate Students	38	49

The details of the number of subjects who filled the GEFT and the SDLRS within each level and within each subject matter category is presented in table no. 3.3.

Table 3.3

The Number of Subjects' Who Filled the GEFT and SDLRS in Each Subject Matter Category within Each Educational Level.

Category	Mathematics		Education & Helping Disciplines	
	SDLRS	GEFT	SDLRS	GEFT
Pre University	28	46	26	33
First Year University	20	21	14	16
Advanced and Last Year University	15	24	19	26
Graduate	24	19	19	25

Among the subjects who participated in this study there were 84 males and 110 females. Data about the sex of 21 participants were missing. Table 3.4 describes the number of males and females who filled the SDLRS and the GEFT respectively.

Table 3.4

The Number of Males and Females Who Filled the GEFT and SDLRS.

CATEGORY	SDLRS	GEFT
Males	68	84
Females	91	110
Missing Data	56	21
Total	215	215

The age range of subjects was 18-62. This range was divided into categories which are described in table 3.5.

Table 3.5

Age Groups in Sample

Age	N
18 - 20	40
21 - 25	57
26 - 30	18
31 - 35	14
36 - 45	20
46 - 55	11
Over 55	1
Missing data	54
Total	215

The subjects who participated in this study had completed between 7 -29 schooling years. Table 3.5 describes this information according to categories.

Table 3.6

The Number of Schooling Years Completed by Adult Students Participating in the Study.

No. of Schooling Years Completed	No. of Subjects
7	1
11-12	32
13-14	41
15-16	37
17-18	38
19 and over	12
Missing data	54
Total	215

Null Hypotheses

1. There is no relationship between self-directedness in learning among adult students as measured by the Self Directed Learning Readiness Scale and their cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test.

2.1 There is no relationship between openness to learning opportunities among adult learners as measured by the Self-Directed Learning Readiness Scale and their cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test.

2.2 There is no relationship between the self-concept as an effective learner of adult students as measured by the Self-Directed Learning Readiness Scale and their cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test.

2.3 There is no relationship between the initiative and independence in learning of adult students as measured by the Self-Directed Learning Readiness Scale and their cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test.

2.4 There is no relationship between the informed acceptance of responsibility of adult students as measured by the Self-Directed Learning Readiness Scale and their cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test.

2.5 There is no relationship between the love of learning of adult students as measured by the Self-Directed Learning Readiness Scale and their cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test.

2.6 There is no relationship between the level of creativity of adult students as measured by the Self-Directed Learning Readiness Scale and their cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test.

2.7 There is no relationship between the future orientation of adult learners measured by the Self-Directed Learning Readiness Scale and their cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test.

2.8 There is no relationship between the ability of adult students to use basic study skills and problem solving skills as measured by the Self-Directed Learning Readiness Scale and their cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test.

3.1 There is no difference in self-directedness in learning as measured by the Self-Directed Learning Readiness Scale between male and female adult students.

3.2 There is no difference in the cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test between male and female adult students.

4.1 There is no difference in the level of self-directedness in learning as measured by the Self-Directed Learning Readiness Scale between adults of different age groups.

4.2 There is no difference in the cognitive style of field-dependence-independence as measured by the Group Embedded Figures Test between adults of different age groups.

5.1 There is no difference in the level of self-directedness in learning as measured by the Self-Directed Learning Readiness Scale among adults from different educational levels.

5.2 There is no difference in the cognitive style of field-dependence-independence is measured by the Group Embedded Figures Test among adults of different educational levels.

6.1 There is no difference in self-directedness in learning as measured by the Self-Directed Learning Readiness Scale between adult students in courses of education and helping disciplines and adult students in courses of mathematics and natural sciences.

6.2 There is no difference in field-dependence-independence as measured by the Group Embedded Figures Test between adult students in courses of education and adult students in courses of mathematics and natural sciences.

Chapter IV

PRESENTATION AND ANALYSIS OF FINDINGS

The purpose of this chapter is to describe the results of the various statistical analyses which were conducted in an attempt to answer the research questions which indicated the need for this investigation.

Analysis of Data

The analysis of the data gathered in this investigation was completed using the Statistical Package for the Social Sciences (SPSS) (Nie & Hull, 1981; Nie, Hull, Jenkins, Steinbrenner & Brent, 1975) and the computer facilities at Concordia University.

Pearson Product-Moment correlation co-efficients and an analysis of variance were calculated to test Hypothesis No. 1 which aimed at studying the relationship between readiness for self-directed learning and field-dependence-independence. The eight factors of readiness to self-directed learning in hypotheses 2.1 - 2.8 were treated by a factor analysis, with the intention of correlating the eight factors of the SDLRS to field-dependence-independence scores by using a Pearson Product-Moment correlation analysis.

Hypotheses No. 3.1, 4.1, 5.1, 6.1, studying differences in readiness for self-directed learning according to educational level, type of subject matter, sex and age and the interaction between these variables were studied by means

of separate one-way analysis of variance and a complex four-way analysis of variance.

Hypotheses No. 3.2, 4.2, 5.2, 6.2, were also studied by using one-way analysis of variance and four-way analysis of variance. These hypotheses investigated differences in field dependence-independence according to educational level, type of subject matter, sex and age and the effect and interaction between these variables.

Descriptive Statistics About the Study Sample

1) Adult Learners' Degree of Self-Directedness in Learning.

160 subjects completed and returned the SDLRS. Table 4.1 presents the various findings which describe the state of readiness for SDL among these subjects.

Table 4.1

Descriptive Statistics for Readiness to Self-Directed Learning

N	Minimum	Maximum	Mean	Median	Mode	Variance
160	86	287	221.89	226.50	243.00	808.34

The scores of these adult students ranged from 86, which was described by Guglielmino (1982) as low, to 287, which was described as high. The average score in this sample was 221.89. This score is slightly higher than the one

specified by Guglielmino (1982) as the average for adults completing the questionnaire, which is 214. However, the mean score of this sample still falls within the range of scores 202-226, which were defined by Guglielmino (1982) as describing average readiness to SDL. Thus the subjects who participated in the present investigation were found to score from low to high in readiness to self-directed learning and were generally found to be average in their degree of self-directedness in learning. These findings provide support to Pratt's (1984) and Even's (1985) conclusion that in contrast to some assumptions in the literature, not all adults are highly self-directed learners, and adults are not always interested in or capable of coping with educational activities that call for a high degree of self-direction.

2) Adult Learners' Degree of Field-Dependence-Independence.

215 subjects completed the Group Embedded Figures Test. Table 4.2 provides descriptive statistics for the variable of Field-Dependence-Independence among these subjects.

Table 4.2

Descriptive Statistics for Field-Dependence-Independence

N	Minimum	Maximum	Mean	Median	Mode	Variance
215	0	18	10.58	11.44	16	29.09

The scores on the GEFT of the subjects in this investigation ranged from 0 to 18. Thus, these scores

describe students' scores across the whole range of cognitive style tendencies. The mean score was 10.58. There has been no information in the literature about mean scores for the general population of adult students across a spectrum of educational levels as broad as the one observed in this study. The norms available are for liberal arts college students and are presented separately for males and females (Witkin et al., 1971). It appears that the average score for this sample tend to cluster around the middle of the FDI continuum, with a slight tendency towards the FI end. It must be remembered, however, that there were 15 more students of mathematics in this investigation than there were students of education and the helping professions, which may have affected the results. It is concluded that adult learners appear to differ in their degree of field-dependence-independence. Thus, the findings of this analysis appear to be similar to those that were observed among populations of learners in elementary, high school and traditional college age groups. Individual differences in cognitive style are also descriptive of a mixed population of traditional age and older adult students, across a broad spectrum of educational levels.

Statistical Analyses of Hypotheses

Hypothesis No. 1.

The null hypothesis expected that there would be no

statistically significant differences in field-dependence-independence between adult students with low, average and high scores on the SDLRS using Guglielmino's cut off points. One-way analysis of variance was conducted in order to test this hypothesis.

The one-way analysis of variance revealed that there are statistically significant differences in FDI between adults with low, average and high degrees of readiness to SDL. Therefore, the null hypothesis was rejected. An increase in the degree of FI is observed from low to high self-directedness in learning. Tables 4.3 and 4.4 describe the findings of this analysis.

Table 4.3

Descriptive Statistics for Field-Dependence-Independence by Level of Readiness to Self-Directed Learning.

SDLRS Score	N	Mean	Standard Dev.	Standard Error	Minimum	Maximum
86-210 (low)	34	8.74	5.43	.93	0	17
202-226 (average)	46	10.26	5.52	.81	0	18
227-290 (high)	80	12.37	4.98	.56	0	18
Total	160				0	18

Table 4.4

One-Way Analysis of Variance for Field-Dependence-Independence by Level of Readiness to Self-Directed-Learning

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	2	350.76	175.38	6.40**
Within groups	157	4304.24	27.41	
Total	159	4654.99		

** p < .01
* p < .05

Because an analysis of variance is a cruder measure of the relationship between variables, a Pearson Correlation was obtained in order to gain information about the degree of the relationship between readiness to SDL and FDI. The null hypothesis expected that there would be no relationship between readiness to self-directed learning and field-dependence-independence. A Pearson correlation was obtained between the total sample scores on SDLRS and GEFT. Table 4.5 describes the results of this analysis and various other correlation coefficients within sub groups.

Table 4.5

Pearson Correlation Coefficients for Students of Mathematics and Education, Males and Females: The Relationship Between Readiness to Self-Directed Learning and Field-Dependence-Independence.

Group	R	N
Total sample	.24 **	160
Students of education and the helping professions	.36 **	78
Students of mathematics	.21 *	82
males	.28 *	68
females	.25 **	91

** $p < .01$
* $p < .05$

A low positive correlation ($r=.24$) was found. It was significant at 1% level of confidence. Therefore, the null hypothesis was rejected.

Further statistical analyses were conducted in order to obtain correlation coefficients within specific sub-categories of the total sample. These correlation coefficients are also described in Table 4.5. Correlation coefficients obtained within the education group, the math groups males and females ranged from .21 to .36 and were significant at 5% level of confidence.

Pearson product-moment correlations within other sub-groups yielded statistically significant positive

correlations within the pre-university group and the group of first year students. These are described in table 4.6.

Finally, an additional analysis was conducted with the scores of those students whose mother tongue is English, while eliminating the scores of those whose mother tongue was French or any other language. A Pearson correlation revealed a statistically significant positive correlation of a moderate degree (N=95, R=.40, P <.01). This finding is also described in Table 4.6. Other correlations described in table 4.6 (for example: first year education students, advanced and first year mathematics students) could also be significant if the N was higher.

Table 4.6

Pearson Correlation Coefficients for Additional Sub Section: The Relationship Between Readiness to Self-Directed Learning and Field-Dependence-Independence.

Group	R	N
English mother tongue	.40 **	95
Pre-university students.	.28 *	54
First year university students	.35 *	34
Advanced & last year university students	.11	34
Graduate students	.18	30
Education & helping profession students - pre university level	.23	26
Education & helping profession students - first year university level	.34	14
Education and helping profession students - advanced and last year university level	.28	19
Education & helping profession students - graduate level	.10	19
Mathematics students - pre university level	.26	28
Mathematics students - first year university level	.38 *	20
Mathematics students - advanced & last year level	.11	15
Mathematics students - graduate level	.21	19

P < .01 **
P < .05 *

The important finding appears to be that a low but statistically significant positive correlation was found between readiness to self-directed learning and field-dependence-independence in the total sample. The review of the various correlation coefficients within the sub-sections of the total population revealed no specific pattern of increase or decrease in the degree of the correlation. It appears that adult students who are relatively more FI are also likely to be more ready for self-directed learning, while relatively more FD individuals are likely to be less self-directed. This conclusion is further reinforced by the results of the correlation obtained for the scores of those subjects whose first language was English. This correlation was of a larger degree and may be described as moderate. It highlights, however, a new dimension of readiness to self-directed learning, that of the relationship between language skills, cultural background and present conceptions of adults' self-directedness in learning. The language of instruction in all the educational institutions in which the present investigation was conducted is English. The SDLRS form administered was also written in English. Nevertheless, the correlation coefficient of the highest degree that was obtained was among those whose mother tongue was English. This raises some questions. It is possible that the English language skills of the participants contributed to the increase in the degree of the coefficient. It is also possible, however, that the cultural attitudes and the

meaning given to the concept of self-directed learning within a certain cultural context have caused these results.

Not withstanding this last observation, however, the results of the statistical analyses conducted to test hypothesis No. 1 support the conclusion that there is some relatfonship between readiness to SDL and FDI. Thus the results of the various analyses conducted support the suggestions of Brundage & Mackereacher (1980) and Even (1982, 1984) that being a self-directed learner implies, at least in part, being a field-independent person. These results challenge those of Powell (1976), who concluded that the FDI cognitive style does not predispose a student to select a particular option for independent study and is not a good predictor of the amount of structure students desire. They also appear to challenge Moore (1976), who concluded that "field independence cannot be used to predict learning autonomy" (p. 154).

Hypotheses No. 2.1 - 2.8

Hypotheses No. 2.1 - 2.8 were introduced in order to identify the relationship between each one of the 8 factors which Guglielmino (1977, 1982) had identified as being a part of the SDLRS, and the subjects' degree of field-dependence-independence. The design of these hypotheses was motivated by a desire to understand and describe in a more

detailed fashion whether, among the variables which operationally define self-directedness in learning, there can be found a particular set of variables which describe more specifically the learner's preferences, characteristics, attitudes and skills that are associated with greater FD or FI. Thus, in addition to yielding a general description of the correlation between self-directedness in learning and field-dependence-independence, it was hoped that such an analysis would provide an answer to the following questions:

1) Is there any sub-set of variables of the SDLRS, and therefore a set of elements of self-directedness in learning which is highly related to field-dependence-independence?

2) What are the elements of such a factor?

By examining these hypotheses, it was hoped that additional information would be provided that would enable a more detailed representation of the principles, processes and cognitive operations which underlie self-directed learning. This information, it was expected, would lead to the clarification of the theory of self-directed learning and help practitioners and researchers in identifying adults who manifest different stylistic orientations. Such information could later contribute to the identification of guidelines for intervention.

The original factors of the SDLRS were determined by Guglielmino (1977) in a tryout version based on a study of 307 adult students, as described in chapter 4 of this thesis. These factors were based on a tryout version of the

scale, and were labeled as follows:

1) Openess to Learning Opportunities 2) Self Concept As An Effective Learner, 3) Initiative and Independence in Learning, 4) Informed Acceptance of Responsibility for One's Own Learning, 5) Love of learning, 6) Creativity, 7) Future Orientation, 8) Ability to Use Basic Study skills and Problem Solving Skills. These factors were described in detail in the original study which developed the SDLRS (Guglielmino, 1977) and in a later manual which describes the scale (Guglielmino, 1982). However, the final product of the original study was a revised version of the SDLRS, but not a revised version of the factors underlying the scale.

In a personal communication with Guglielmino (1985), an additional version of the scale's factors, one which is different from the original factors and based on the revised scale was provided, but without details as to the number of subjects who participated in this study and their characteristics. Only two studies used this last set of factors in an empirical investigation. Sabbaghian (1979) studied adult college students and found some relationship to self esteem. Brockett (1985b) studied older adults and found correlations between some of the factors and educational attainment and life satisfaction. However, another study identified a different factor structure with gifted children (Mourad, 1979). Thus, it appears that the final nature and cluster of elements which constitute the

factors of the SDLRS has not been determined yet. Although Guglielmino (1977) had intended after the original study to proceed and develop a scoring key for each of the factors that she had identified, to date, no information of this kind has been available.

The culmination of all the information regarding the factor structure of the SDLRS, and the fact that no research literature has been published which focused on this aspect of the structure to date, led to the conclusion that caution must be exercised in any effort regarding the study of the scale's factors. According to Kerlinger (1973), the purpose of factor analysis is to determine the number and nature of the variables underlying a large number of measures. "It tells us, in effect, what tests or measures belong together - which ones virtually measure the same thing, in other words, and how much they do so" (p.659). Thus, factor analysis "helps the scientist to locate and identify unities or fundamental properties underlying tests or measures" (p. 659). Kerlinger (1973) has added that one purpose of the factor structure which is yielded by factor analytic studies is to serve as a tool for confirming the construct validity of various measures. More specifically, factor analysis "enables the researcher to study the constitutive meanings of constructs - and thus their construct validity" (p. 686). Researchers, however, are warned that great caution must be exercised in considering the scientific value of factor analysis and the products that it yields:

> In considering the scientific value of factor analysis, the reader must be cautioned against attributing 'reality' and uniqueness to factors. The danger of reification is great. It is easy to name a factor and then to believe there is a reality behind the name. But giving a factor a name does not give it reality. Factor names are simply attempts to epitomize the essence of factors. They are always tentative, subject to later confirmation or disconfirmation. Then, too, factors can be produced by many things. Anything that introduces correlation between variables 'creates' a factor. Differences in sex, education and social and cultural background, and intelligence can cause factors to appear. Factors also differ - at least to some extent - with different samples. Response sets or test forms may cause factors to appear. Despite these cautions, it must be said that factors do repeatedly emerge with different tests, different samples, and different conditions. When this happens, we have reassurance that there is an underlying variable that we are successfully measuring. (Kerlinger, 1973, p. 688)

An observation of the nature of the various factors which have been identified in the SDLRS throughout its short history, especially the fact that no two identical clustering of factors were reported and the relatively small number of samples that were reported in the literature thus led to the re-evaluation of the factor structures which are reported by Guglielmino (1977, 1985). Coupled with the warnings of Kerlinger, (1973) these observations led to the decision that before the factor structures which Guglielmino has described were adopted in the present investigation, one must check whether the same underlying variables are observed in this sample. Consequently, a series of factor analytic studies was initiated, so that similarities or differences could be observed. In other words, it was concluded that before a correlational investigation of each factor of the SDLRS with

subjects' scores on the GEFT is undertaken, the construct validity and the nature of the constitutive definition of each factor must be reconfirmed.

In order to re-confirm the constitutive definitions of each of the eight factors of the Self-Directed Learning Readiness Scale, the first step which was undertaken was the development of an inter-correlation matrix. Following this, a principal components factor analysis with orthogonal rotation was undertaken, using Kaiser normalization procedures. In the initial analysis, sixteen factors emerged. In a later phase, an attempt was made to eliminate spurious factors and limit the number of factors. Thus, only principal axes with eigenvalues (sums of squared loadings) greater then one were rotated and eight-factor and five factor solutions were run. According to Child (1970), the largest loading values usually define the meaning of the factor. Therefore, only those items with a loading of .30 or higher were selected. Reverse items were also identified A close inspection of each of the factors which were produced revealed that items with high loadings, which tend to define the constitutive meaning of constructs, did not appear consistently in the same manner and combination, and under the same factor-clusters both in the factors identified by Guglielmino and those identified in the present investigation. Detailed descriptions of the factor solutions are available upon request.

According to Kerlinger (1973), factor analysis serves

two primary purposes: "to explore variable areas in order to identify the factors presumably underlying the variables; and, as in all scientific work, to test hypotheses about the relations among variables" (p. 685). It was the original intention of the present study to try and answer in an exploratory fashion the question of relationship of field-dependence-independence to anyone of the factors of self-directedness in learning, as defined by Guglielmino. It was expected that the nature of the factors would be inferred from the study of their relationship with FDI. However, for all the reasons that were described earlier, it was decided that the first necessary step is that of reconfirming the constitutive meaning of each of the factors, and the SDLRS in general. As the findings reveal, no consistent pattern of any of the factors which were described by Guglielmino has been observed. These results may be attributed to changes in the characteristics of the sample. They may also be attributed to the fact that there has not been sufficient number of factor analytic studies which warrant a definite conclusion regarding the underlying construct of readiness to self-directed learning.

Kerlinger (1973) suggested that factor analysis helps us check our theoretical expectations. He added that factor analytic explorations of variables may well preceed many research areas. He cautioned, however, that this does not mean that "a number of tests are thrown together and given to any samples that happen to be available" (p. 687).

Instead, he recommended that" factor analytic investigations, both exploratory and hypothesis-testing, have to be painstakingly planned. Variables that may be influential have to be controlled - sex, education, social class, intelligence and so on. Variables are not put into a factor analysis just to put them in" (p. 687). The results of the present investigation, viewed from both theoretical and empirical perspectives suggest, therefore, that before the hypothesis testing study which was planned can be pursued, a definite conclusion regarding the underlying factor constructs of the SDLRS must be reached by the means of a series of well designed exploratory factor analytic studies. This, it appears, is a subject for an additional comprehensive study. Because this is a lengthy research, and it has not been a part of the set of objectives of this inquiry, it was decided that it must await future research. Therefore, at his point the series of correlational hypotheses No. 2.1 - 2.8 were left untested, and the emerging relevant recommendations are discussed in the last chapter of this thesis.

Hypothesis - No. 3.1

The null hypothesis expected that no statistically significant differences would be observed in self-directedness in learning among adult students attending courses in various educational levels. One- way analysis of variance revealed no statistically significant differences.

Therefore, the null hypothesis was accepted. Tables 4.7 and 4.8 describe the results of this analysis.

Table 4.7

Descriptive Statistics for Readiness to Self-directed Learning by Educational Level

Level	N	Mean	Stand. Dev.	Stand. Error	Min.	Max.
Pre University	54	219.87	24.10	3.28	176.00	283.00
First year undergraduate	34	221.03	28.49	4.89	137.00	262.00
Advanced & last year undergraduate	34	221.06	25.47	4.34	171.00	261.00
Graduate	38	226.26	36.23	5.88	86.00	287.00
Total	160	221.89				

Table 4.8

One-Way Analysis of Variance for Readiness to Self-Directed Learning by Educational Level

Source	DF	Sum Squares	Median Squares	F Ratio
Between groups	3	995.67	331.89	.41
Withing groups	156	127530.31	817.50	
Total	159	128525.98		

** P < .01
* P < .05

A four-way analysis of variance also revealed no main effect to the educational level, nor were there any

interactions among the variables of age, sex, type of subject matter studied and educational level. These are described in Appendix F.

In institutions of pre university and higher education, individuals may enroll in programs while already posessing a degree or a diploma. People may do so for many reasons, but the fact which must be borne in mind is that in adult and higher education in many courses, at any given educational level, different individuals may attend who have completed a different number of schooling years. Therefore, an additional null hypothesis was posed which expected that there would be no statistically significant differences in the degree of readiness for SDL between adult students who had completed a different number of schooling years. One way analysis of variance revealed that no statistically significant differences exist, and the null hypothesis was accepted. Tables 4.9 and 4.10 describe the findings of this analysis.

Table 4.9

Descriptive Statistics for Readiness to Self-Directed Learning by Number of Schooling Years Completed.

Schooling Years	N	Mean	Stand. Dev.	Stand. Error	Min.	Max.
11-12	30	213.77	21.18	3.87	176.00	260.00
13-14	36	218.03	37.70	6.29	86.00	265.00
15-16	34	223.68	24.10	4.13	185.00	283.00
17-18	36	226.80	31.03	5.17	142.00	287.00
19 and over	12	231.91	18.21	5.26	202.00	264.00
Total		221.72			86.00	287.00

Table 4.10

One-Way Analysis of Variance for Readiness to Self-Directed Learning by the Number of Schooling Years Completed.

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	4	4697.30	1174.33	1.41
Within groups	143	119458.33	835.37	
Total	147	124155.64		

** P < .01
* P < .05

An additional one way analysis of variance was conducted within the English-speaking group alone and it revealed no statistically significant differences as well. Information regarding this analysis is presented in Appendix K.

Similarly, a four-way analysis of variance revealed no main effect to the number of schooling years completed by participants in the study. There were also no interactions between age, sex, type of subject matter studied and amount of schooling. The results of this analysis are presented in appendix G.

Because an analysis of variance is a cruder measure of the relationship between variables, a Pearson Correlation was obtained in order to further understand the relationship between the level of self-directedness and the number of schooling years completed by an adult learners. The null hypothesis expected that there would be no statistically significant difference between these two variables. The correlation coefficient obtained was .17 and it was significant at 5% level of confidence (N= 136). This led to the rejection of this additional null hypothesis and to the conclusion that a low but statistically significant positive relationship exists between adults' readiness to self-directed learning and the number of schooling years they have completed.

The lack of statistically significant differences in self-directedness in learning between adults attending courses in various educational levels is surprising. The fact that this analysis was conducted with various measures of educational attainment with no apparent differences or any observable pattern, and the low correlation coefficient obtained are inconsistent with the literature. According to Hassan (1981), the amount of education attained by an

individual may predict his/her level of self-directedness. Similarly, Sabbaghian (1979) concluded that adult students attending courses at a higher level are more self-directed in learning than those attending courses in lower educational levels. Finally, Brockett (1983) found a statistically positive correlation of .29 at 5% level of confidence between self-directedness and amount of schooling and concluded that increased self-directedness in learning is likely to be associated with a larger number of schooling years. While such a general conclusion may be reached on the basis of the findings of the present investigation, this is a very low correlation which requires caution in its interpretation. It appears, then, that the nature of the relationship between self-directedness in learning, the amount of educational attainment and the nature of the differences across various educational levels must be further clarified.

Hypothesis No. 3.2

The null hypothesis expected that there would be no statistically significant differences in the degree of FDI between adult students who attend courses at different educational levels. One-way analysis of variance revealed a difference which was significant at 1% level of confidence. Thus, the null hypothesis was rejected. Tables 4.11 and 4.12 provide detailed descriptions of this analysis.

Table 4.11

Descriptive Statistics For Field-Dependence-Independence by Educational Level.

Level	N	Mean	Standard Dev.	Minimum	Maximum
Pre-university	79	8.86	5.17	Ø	18
First year university	37	11.51	5.68	1	18
Advanced & last year university	5Ø	11.Ø4	5.2Ø	Ø	18
Graduate	49	12.16	5.1Ø	Ø	18
Total	215	1Ø.58			18

Table 4.12

One-Way Analysis of Variance for Field-Dependence-Independence by Educational Level.

Source	DF	Sum Squares	Mean Squares	F Ratio
Between groups	3	399.16	133.Ø5	4.81**
Within groups	211	5825.33	27.61	
Total	214	6224.48		

** P < .Ø1
* P < .Ø5

A pattern of increase in the degree of field-independence from pre-university level to graduate level is observed. The slight decrease in FDI between the sample of students in the first year of university studies and students in the advanced and last year courses may be

explained by two facts. First there were more students of mathematics studying in the first year than there were students of education and the helping professions. This might have caused a larger mean score on the GEFT at this level. The opposite was true at the advanced and last year level group, which was larger among the education group than in the mathematics group. Another plausible explanation may be related to some difficulties in recruitment. The classes in the advanced undergraduate level included some courses that are advanced, but not last year courses. If there is a relationship betweeen education and FI, the lower mean scores at the advanced level may be attributed to this fact. Nevertheless, the pattern that emerges is that of sharp differences in FDI, with a sharp increase in independence from pre-university to undergraduate and graduate level.

A further analysis of the data, using a four-way analysis of variance and including the variables of age, sex, subject matter and educational level revealed an F of 3.60 at 1% level of significance. This indicates that a statistically significant main effect of the educational level in which an individual studies on the degree of FI exists. Appendix H describes this finding.

As the findings reveal, adult students who attend courses in higher educational levels are relatively more field-independent than adult students who attend courses in lower educational levels. These findings are not surprising. Peterson & Eden (1981) and Kirby (1979) concluded that

the amount of schooling years completed may be related to individual cognitive style, and that "persons with more formal education are likely to be field-independent" (Peterson & Eden, 1981 p. 60).

A further one-way analysis of variance sought to identify whether or not differences in FDI exist between adults who completed a different number of schooling years. No statistically significant difference was found to exist. Tables 4. 13 and 4. 14 describe the findings of this analysis.

Tables 4.13

Descriptive Statistics for Field-Dependence-Independence by Schooling Years.

Schooling	N	Mean	Stand. Dev.	Stand. Error	Min.	Max.
11-12	32	8.81	5.37	.95	Ø	18
13-14	41	11.56	5.76	.9Ø	1	18
15-16	37	1Ø.76	5.32	.87	Ø	18
17-18	38	11.63	5.21	.85	Ø	18
19 and over	12	11.67	5.45	1.57	3	18
Total	16Ø	1Ø.85			Ø	18

Table 4.14

One-Way Analysis of Variance for Field-Dependence-Independence by Schooling Years

Source	D.F	Sum of Squares	Mean Squares	F Ratio
Between groups	4	185.11	46.28	1.568
Within groups	155	4573.29	29.50	
Total	159	4758.40		

** P < .01
* P < .05

However, a four-way analysis of variance, which considered the complex relationship between the variables of age, sex, subject matter studied and the number of schooling years found a statistically significant main effect to the amount of schooling on field-independence. Appendix J describes the findings of this analysis.

The difference, which is significant at a level of confidence of 5% leads to the conclusion that learners who complete a larger number of formal schooling years are more field-independent. Thus, this secondary analysis provides additional support to the conclusion regarding a relationship between education and greater field-independence.

Hypothesis No. 4.1

The null hypothesis expected that no statistically significant differences would exist in readiness to self-

directed learning between adult students in courses of education and the helping professions versus adult students in courses of mathematics and the natural sciences. One-way analysis of variance revealed no statistically significant differences, nor were there any observable pattern in the mean scores. Therefore the null hypothesis was accepted. Tables 4.15 and 4.16 describe the findings of this analysis.

Table 4.15

Descriptive Statistics for Readiness to Self-Directed Learning by Subject Matter

Subject	N	Mean	Stand. Dev.	Stand. Error	Min.	Max.
Education & the helping professions	78	224.58	25.13	2.85	160	287
Mathematics	82	219.33	31.19	3.44	86	283
Total	160	221.89			86	287

Table 4.16

One-Way Analysis of Variance for Readiness to Self-Directed Learning by Subject Matter

Sources	D.F	Sum of Squares	Mean Squares	F Ratio
Between groups	1	1100.83	1100.83	1.40
Within groups	158	127425.15	806.49	
Total	159	128525.97		

** P < .01
* P < .01

An additional one way analysis of variance was conducted within the English-speaking group alone and it revealed no statistically significant differences as well. Information regarding this analysis is presented in Appendix K.

Similarly, a four-way analysis of variance revealed no main effect of the type of subject matter studied when it is considered together with age, education and sex. There was also no interaction among the variables in relation to self-directedness in learning. The results of this analysis are presented in appendices F and G.

This finding is not surprising. The SDLRS was developed by Guglielmino (1977) in such a way so that the mean scores of students studying various fields would not be different. The reason for this design of the scale was the desire that the effect of specialization in any particular subject matter and its relationship to preference for independent study which was observed by Morstain (1974) would not interfer with identifying the skills and values

that are associated with SDL. Thus, in contrast to the GEFT, the SDLRS and the concept of self-directedness that it represents are not strongly associated with the the study of any particular field.

Hypothesis No. 4.2

Null hypothesis 4.2 expected that no statistically significant differences in field-dependence-independence would be observed between adult students studying in courses of education and the helping professions and adult students studying in courses of mathematics and the natural sciences. One-way analysis of variance revealed a difference which was significant at a level of confidence of 1%. this led to the rejection of the null hypothesis. Tables 4.17 and 4.18 describe the findings of this analysis.

Table 4.17

Descriptive Statistics for Field-Dependence-Independence by Subject Matter

Subject	N	Mean	Stand. Dev.	Stand. Error	Min.	Max.
Education & the helping professions	100	9.37	5.18	.52	0	18
Mathematics	115	11.63	5.38	.50	0	18
Total	215				0	18

Table 4.18

One-Way Analysis of Variance for Field-Dependence-Indspendence by Subject Matter

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	1	276.78	276.78	9.91**
Within groups	213	5947.70	27.92	
Total	214	6224.48		

** P < .01
* P < .05

It is concluded that there is a statistically significant difference in the degree of FDI between students of mathematics and natural sciences and students of education and the helping professions. The students in the mathematics group are significantly more FI than the students of education and the helping professions.

A further four-way analysis of variance which considered the complex relationship between age, education, sex and type of subject matter studied in relation to FDI, found a main effect of the type of subject matter which was significant at 1% level of confidence. This suggests that there is a relationship between the type of subject matter studied by adult students and their degree of field-dependence or-independence. These findings are also described in appendix H and appendix J.

These findings are also consistent with the FDI theory

(e.g., Witkin, 1976; Witkin & Goodenough, 1981; Witkin, et al., 1977; Witkin, Moore et al., 1977). According to this body of knowledge, "relatively field independent persons favour impersonal domains which require competence in cognitive articulation and field-dependent persons favour interpersonal domains" (Witkin et al., 1977, p. 43). A longitudinal study conducted by Witkin and his associates (1977) found that from entrance to college to graduate school, individuals tended to choose professional and vocational domains that are compatible with their style. Studies involving adult students of a non traditional age also found similar differences in the curricular choices of FD and FI individuals (e.g., Martens, 1976; De Cosmo, 1977). The fact that in the total interaction among variables, a main effect that was statistically significant was found, also serves to reinforce this conclusion. It offers that such differences are expected, partly because of the inclination that the individual brings with him/her and partly because of the content dealt with in the educational situation (Witkin et al., 1977).

Hypothesis No. 5.1

The null hypothesis expected that there would be no statistically significant difference in self-directedness in learning between male and female adult students. One-way analysis of variance revealed that no statistically significant difference exists. This led to the acceptance

of the null hypothesis. Tables 4.19 and 4.20 describe the results of this analysis.

Table 4.19

Descriptive Statistics for Readiness to Self-Directed Learning by Sex

Sex	N	Mean	Stand. Dev.	Stand. Error.	Min.	Max.
Males	68	218.44	32.18	3.90	86.00	265.00
Females	91	224.70	25.20	2.64	160.00	287.00
Total	159	222.02			86.00	287.00

Table 4.20

One-Way Analysis of Variance for Readiness to Self-Directed Learning by Sex

Source	D.F	Sum of Squares	Mean Squares	F Ratio
Between groups	1	1526.15	1526.15	1.89
Within groups	157	126517.75	805.85	
Total	158	128043.90		

** P < .01
* P < .05

An additional one-way analysis of variance was conducted within the English-speaking group alone and it revealed no statistically significant differences as well. Details regarding this analysis are presented in Appendix K.

A further, four-way analysis of variance, including age, subject matter, education and schooling also revealed no main effect or interaction between variables in relation to self-directedness in learning. These findings are presented in appendices F. and G.

This finding appears to be inconsistent with those of Sabbaghian (1979), who concluded that females have greater abilities to organize and plan their learning activities than male adult students. It suggests that additional research needs to be conducted to clarify whether or not sex differences in readiness to self-directed learning exist.

Hypothesis No. 5.2

The null hypothesis expected that no statistically significant differences in field-dependence-independence would be observed between male and female adult students. One-Way analysis of variance revealed a difference which was significant at a level of confidence of 5%. This led to the rejection of the null hypothesis. Thus, it is concluded that there is a statistically significant difference between male and female adult students, with males being more field independent than females. The null hypothesis was rejected. Tables 4.21 and 4.22 describes the findings of this analysis.

Table 4.21

Descriptive Statistics for Field-Dependence-Independence by Sex

Sex	N	Mean	Stand. Dev.	Stand. Error.	Min.	Max.
Males	84	11.86	5.55	.60	Ø	18
Females	100	10.09	5.15	.49	Ø	18
Total	184	10.86			Ø	18

Table 4.22

One-Way Analysis of Variance for Field-Dependence-Independence by Sex

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	1	148.58	148.58	5.24*
Within groups	192	5443.38	28.35	
Total	193	5591.96		

** P < .01
* P < .05

A four-way analysis of variance, however, revealed no statistically significant main effect, nor was there any interaction between the variable of sex and other variables. It is possible that the four-way analysis of variance did not identify sex differences because it included a smaller number of subjects than the one-way analysis of variance. The findings of this analysis are presented in appendix H

and appendix J.

The finding of statistically significant differences between men and women in FDI, with women scoring significantly lower than men are consistent with the conclusion of both Cross (1976) and Peterson & Eden (1981). Cross (1976), however, concluded that "while women in Western cultures are relatively more FD than men, these differences are not universal in non Western data" (p. 118). Furthermore, Goldstein & Blackman (1978) reviewed research findings and concluded that due to the variety of testing instruments, the effect of testing situations and insignificant differences between samples, the results of research are inconclusive. Still, the significant difference in the present study suggests that at least in this sample, men are relatively more FI than women.

Hypothesis No. 6.1

The null hypothesis expected that there would be no statistically significant differences in the degree of self-directedness in learning between adults of various age groups. One-way analysis of variance revealed no statistically significant differences between adult learners who are 16-25 years old, adults who are 36-45 years old, adults who are 46-55 years old and those adults who are older than 55. These findings led to the acceptance of the null hypothesis. The findings are described in Tables 4.23 and 4.24.

Table 4.23

Descriptive Statistics for Readiness to Self-Directed Learning by Age

Age	N	Mean	Standard Dev.	Standard Error	Minimun	Maximun
16-25	90	220.04	24.98	2.63	148	265
26-35	29	224.65	29.99	5.57	137	271
36-45	18	226.55	43.65	10.29	86	283
46-55	11	221.64	2249	6.78	188	257
Total	140	221.86				

Table 4.24

One-Way Analysis of Variance for Readiness to Self-Directed Learning by Age

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	3	920.66	306.88	.37
Within groups	144	118173.36	820.65	
Total	147	119094.02		

** p < .01
* p < .05

A further analysis sought to identify whether there are any differences in readiness to self-directed learning between adult students of the traditional age in higher education, those who are 25 and younger, and adult students who are older. Again, no statistically significant

differences were observed. These findings are described in Tables 4.25 and 4.26.

Table 4.25

Descriptive Statistics for Readiness to Self-Directed Learning between Traditional Age and Older Adult Students

Age	N	Mean	Standard Dev.	Standard Error	Min.	Max.
18-25	45	222.09	24.31	3.62	160	265
25 and over	42	227.33	27.22	4.20	142	283
Total	87	224.62			142	283

Table 4.26

One-Way Analysis of Variance for Readiness to Self-Directed Learning between Traditional Age and Older Adult Students

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	1	597.50	597.50	.901
Within groups	85	56364.98	663.12	
Total	86	56962.48		

** p < .01
* p < .05

One-way analysis of variance was conducted within the English-speaking group alone and it revealed no differences. Information describing this analysis is presented in Appendix K.

A four-way analysis of variance was also conducted, and found no main effect to age or interaction between the variables of age, sex, educational level attended schooling years or type of subject matter. This analysis is described in appendices F and G.

It was concluded that there is no difference in terms of readiness to self-directed learning between adults of various age groups. These findings appear to be consistent with most of the findings of research regarding the relationship between age and self-directed learning (e.g., Caffarella, 1983; Hiemstra, 1975 reported in Sabbaghian, 1979; Tough, 1978). Hassan (1981) found no difference in terms of self-directedness in learning between under 55 and over 55 age groups. Brockett (1983) also found that age was not related to self-directedness in learning. Thus, the findings of this study provide support to Brockett's (1983) conclusion that "growing older, in and of itself, neither limits nor enhances one's potential as a self-directed learner" (p. 18).

Hypothesis No. 6.2

The null hypothesis expected that there would be no statistically significant differences in the degree of FDI between adult students of various age groups. One-way analysis of variance revealed that no statistically significant differences exist. This led to the acceptance of the null hypothesis. Tables 4.27 and 4.28 describe the results of this analysis.

Table 4.27

Descriptive Statistics for Field-Dependence-Independence by Age.

Age	N	Mean	Standard Dev.	Standard Error	Min.	Max.
16-25	97	11.21	5.36	.54	Ø	18
26-35	32	1Ø.75	5.41	.96	Ø	18
36-45	2Ø	11.6Ø	5.84	1.31	1	18
46-55	11	8.92	5.92	1.78	Ø	18
55 and over	1	6.ØØ	Ø	Ø	6	6
Total	161				Ø	18

Table 4.28

One-Way Analysis of Variance for Field-Dependence-Independence by Age

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	4	1Ø9.62	27.41	.92
Within groups	156	4665.98	29.91	
Total	16Ø	4775.6Ø		

** p < .Ø1
* p < .Ø5

As is the case with readiness to SDL, an additional analysis was carried out in order to examine differences in FDI between traditional age (16-25) and older adult students (26 and over). Again, no statistically significant differences were observed. The findings of this analysis are

described in Tables 4.29 and 4.30.

Table 4.29

Descriptive Statistics for Field-Dependence-Independence Between Traditional Age and Older Adult Students.

Age	N	Mean	Standard Dev.	Standard Error	Min.	Max.
18-25	97	11.22	5.36	.54	Ø	Ø
26 and over	64	1Ø.55	5.63	.7Ø	Ø	Ø
Total	161	1Ø.95				

Table 4.3Ø

One-Way Analysis of Variance for Field-Dependence-Independence between Traditional Age and Older Adult Students

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	1	17.29	17.29	.58
Within groups	159	4758.31	29.97	
Total	16Ø	4775.6Ø		

** p < .Ø1
* p < .Ø5

A more complex investigation, using the procedure of four-way analysis of variance, revealed no statistically significant effect to age on field-dependence-independence, nor did it identify any interaction between age and either sex, educational level, number of schooling years completed

or type of subject matter. Appendixes H and J describe the results of this four-way analysis of variance.

This finding is consistent with some research on FDI, CS, but not with all of it. Cross (1976) concluded that "there is a movement toward field independence up to early adolescence, followed by a plateau and some move toward field dependence around the age of fifty. These age patterns seem to hold regardless of culture, but individuals show remarkable stability through life with respect to their relative position on the continuum" (p.118). Goldstein & Blackman (1978) also seem to suggest that greater field-independence is associated with advanced age. Bertinot (1978), however, found that age does not predict performance on tests of FDI, and Kogan (1973) criticized FDI researchers for the absence of an appropriate design and lack of consideration for intervening variables such as education and intelligence, which may be related to FDI. This set of variables was also suggested to be associated with FDI by Peterson & Eden (1981). General studies about the aging process (e.g., Botwinick, 1978) seem to imply that in the interplay of variables, educational attainment may intervene and affect improved performance in many educational situations. While no conclusive generalizations may be reached, the results of four-way analysis of variance also suggest that among populations similar to those observed in the present investigation, age does not appear to be related to FDI, but education is related to greater field-independence.

Thus, the age of adult students in itself may not provide the adult educator with sufficient information as to the expected degree of FDI that a group or an individual would manifest.

Chapter V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to present the conclusions derived from the results of this study and the recommendations that they appear to suggest. These recommendations relate to adult education practice, highlight major theoretical aspects and provide suggestions for further research. This chapter is divided into two major sections: 1) conclusions derived directly from the findings of statistical analyses; 2) general conclusions suggested by the findings.

Conclusions Based on Statistical Analyses

1) A Range of Individual Differences

1.1 The range of scores on SDLRS obtained in this study was quite large, indicating that not all adults are highly self-directed learners. The adult education literature strongly suggests that adults are highly self-directed learners. (cf. Knowles, 1984). This assumption has led to the formulation of program planning and instructional principles which recommend that learners should be allowed and encouraged to plan and conduct their own educational activities in most situations. Much of this theoretical work has not received sufficient empirical support. (cf. Knowles, 1984; Pratt,

1984). The present study, therefore, calls for the reassessment of the assumption that most adults are highly self-directed learners. Because some subjects obtained quite low SDLRS scores, it follows that these people would require a great deal of direction in educational activities. Hence, the results of this study also recommend that joint planning and shared responsibility in educational activities may not always be desirable or helpful to all adult learners. This recommendation stands in contrast to the reported research of Even (1985). Individual and group differences in self-directedness in learning should be considered when approaching program planning and the facilitation of learning. Adult education may also benefit from further conceptual and empirical research that aims at identifying methods of instruction which take into account such individual differences in self-directedness in learning.

1.2 The range of scores on the GEFT was also large, indicating a wide range of individual differences in cognitive style among adult sutdents. This is similar to the findings of research on FDI among elementary and high school students and with the little research that has been done with adult students (e.g., Cross, 1976; Simpson & Walker, 1983). This observation also supports the conclusion that adult learners should be approached from a perspective which takes into account individual differences in the degree of field-independence.

2) Self-Directedness in Learning and Field-Dependence-Independence

2.1 A statistically significant positive correlation was found between adults' readiness to self-directed learning and the field-dependence-independence cognitive style. This suggests that adult students who are relatively more FI are also likely to be more self-directed in learning, while relatively more FD individuals are likely to be less self-directed. Thus, it appears that being a self-directed learner, according to the definition of Guglielmino (1977), requires some competence in cognitive restructuring and some autonomy of external referents. Hence, it seems that the dimension of FDI is relevant to understanding and describing individual differences in self-directedness in learning. This leads to the conclusion that the general findings which were identified by research on FDI may be of value.

The above findings provide support to Even's (1982) plea against a bias in adult education theory, which favours the FI individual over the FD learner. The suggestion of this theory has been that adults are highly self-directed learners and are therefore likely to be highly FI individuals. The program planning principles which have been derived from this assumption result in the lack of structure in many educational settings (cf. Brundage & Mackereacher, 1980; Knowles, 1975, 1984). This may put the FD learner at a disadvantage. Much of these assumptions have been drawn without sufficient empirical support (cf. Even, 1984; Pratt,

1984). This study calls for the reassessment of this assumption. Research aimed at identifying methods which facilitate effective and meaningful learning and greater self-directedness among FD individuals is necessary.

2.2 Greater field-independence appears to count only for a part of what underlies readiness to self-directed learning. From the various theoretical descriptions of the highly-self-directed learner and from the findings of several empirical studies it appears that some competence in interpersonal relations, or field-dependent orientations may also be instrumental in facilitating SDL efforts (e.g.,Brookfield, 1985b; Bigelow & Egbert, 1968; Dressel & Thompson, 1973; Theil, 1984). Research aiming at the examination of the relationship between interpersonal orientation, competence in interpersonal relations and self-directedness in learning is therefore recommended.

3) A Model of Self-Directedness in Learning

Although a correlation was observed between readiness to self-directed learning and field-dependence-independence, this correlation was low, suggesting that field-independence may be viewed as counting only for a part of what Guglielmino (1977, 1982) defined as self-directedness in learning. Consequently, the findings of this investigation join the findings of several other empirical studies that identified only low to moderate correlations between self-directedness in learning and other personality contructs. Such constructs

are self-esteem (Sabbaghian, 1979), creativity, originality and right brain style of thinking (Mourad, 1979; Torrance & Mourad, 1978a, 1978b), life satisfaction (Brockett, 1983, 1985b) and internal locus of control (Skaggs, 1981).

Perhaps what is needed in adult education is a new, more complex theoretical model that describes the personality variables associated with self-directedness in learning. Various discussions in the adult education literature have offered the possibility that such a complex realtionship may exist (e.g., Even, 1984; Kasworm 1983; Penland, 1981). However, these discussions are not based on empirical research. It appears, then, that one of the next tasks that researchers must undertake is an empirical study using multivariate analysis (e.g., Kerlinger, 1973) which would identify the nature of the relationship of SDL to a variety of personality traits.

4) Self-Directedness in Learning in a Multi-Cultural/Multi-Lingual Context

The difference in the correlation coefficients between the total sample and the sample of those whose first language is English, which is the original language of the SDLRS, calls for a review of the concept of self-directedness within broader, multi-cultural and multi-lingual context. The language of instruction in all the institutions that participated is English. If it is assumed that all the students understood the language of instruction in their classes, they did not appear to relate to the SDLRS in the same manner. This raises the

possibility that adult students from different cultures may assign a different meaning to various concepts of SDL. The results of the present study may be interepreted as suggesting that adult educators in the English speaking institutions in Quebec, and perhaps those who are engaged in adult education in other multi-cultural settings, should consider the complex multi-cultural composition their student population. It is possible that individual perceptions of SDL may vary according to one's culture. Therefore, precision and caution in clarifying the meaning and expectations from the learner in various SDL activities must be exercised. In addition, it appears that research aiming at the clarification of the nature and meaning of self-directedness in learning within a multi-lingual and multi-cultural context is necessary.

5) The Factor Structure of the Self-Directed Learning Readiness Scale

A factor analysis of the SDLRS scores among the sample of this study revealed differences in the factor structures between those identified by Guglielmino (1977, 1979) and those identified in the present investigation. More specifically, the items with high loadings in Guglielmino's factors did not appear in the same manner and combination in the present investigation. Thus, additional factor-analytic studies (e.g., Kerlinger, 1973)

which may identify and clarify the nature of the construct of readiness to self-directedness learning, appear to be necessary (cf. Kerlinger, 1973).

6) Education

6.1 There are no statistically significant differences in the level of readiness to self-directed learning between adult students who attend courses at various educational levels. There are also no statistically significant differences in self-directedness between adult students who had completed a different number of schooling years. There is a low but statistically significant positive relationship between the number of schooling years completed by adult students and their level of readiness to self-directed learning. This low correlation is of little practical use. It raises questions regarding the ability of the SDLRS to discriminate between individuals with different educational attainment. Further research must continue to clarify whether the SDLRS discriminates between individuals and groups according to the level of education that they attend.

6.2 There are statistically significant differences in the level of field-dependence-independence between adult students who attend courses at different educational levels. A statistically significant main effect of the educational level attended and the number of schooling years completed on greater FI also exists. It is concluded, therefore, that the

higher the educational level attended, and the more schooling years completed, the more field-independent adult students may be. Adult educators may expect to find more FD and pershaps less self-directed individuals among students who attend courses at lower educational levels and those who have completed a smaller number of schooling years. The opposite may be true among adult students who had completed a larger number of schooling years or who attend courses in higher educational levels, such as undergraduate and graduate courses. Therefore, adult educators are advised that educational attainment and the amount of schooling should be considered when approaching program planning and instruction. Further training in cognitive restructuring to students in various levels is recommended.

6.3 Research on self-directed adult learning in non-institutional settings appears to focus on two distinct kinds of populations. One stream of research, initiated by Allen Tough, (1971, 1979), has focused on adult learners who are highly educated (Brookfield, 1984). The description of the learning process that these individuals pursue appears to imply a systematic, pre-planned, analytically oriented learning approach, which may indicate that the learners are more field-independent (e.g. Brundage & Mackereacher, 1980; Tough, 1979). Another group of studies, initiated and stimulated by Brookfield (1982), has focused on adult learners who completed no more than 12 years of schooling, and appears to suggest the contrary. In this group of studies

learners are described as proceeding in the learning process in a heuristic manner, without following any pre-determined pattern. They take advantage of any opportunity that random events may offer them in order to learn, they use concrete experiences and active experimentation, they solve problems in a trial and error fashion and they rely heavily on other people for information instead of using one's own analytic ability (e.g., Danis & Tremblay, 1985; Theil, 1984). This learning approach seems to characterize the more field-dependent individual (Brookfield, 1985b).

The present study has found that individuals who had completed a larger number of schooling years are relatively more FI, and that those who completed a smaller number of schooling years are more FD. Because the number of schooling years completed is one dimension along which the subjects of the two streams of SDL research appear to differ, it may be that more educated individuals proceed in a relatively more field-independent manner, while less educated individuals follow a more field-dependent style of learning. In the light of the findings of this study, it is therefore suggested that the FDI cognitive style of self-directed adult learners in natural societal settings be studied, so that the emerging dimension of learner characteristics and learning approach be better understood.

7) Type of Subject Matter Studied

7.1 There are no statistically significant differences in the degree of readiness to self-directed learning between adult students in courses of education and the helping professions and students in courses of mathematics and the natural sciences. This finding must be viewed as tentative because the evidence obtained in this study is not strong. Morstain (1974) found some preliminary evidence that indicate a relationship between preference for independent study, academic area of specialization and personal goals. The SDLRS, however, was designed with the intention of by-passing such differences (Guglielmino, 1977). Thus, this study raises the question as to whether or not SDL should be conceived as taking place in the same manner in all situations and program areas, and covering all content areas in a similar fashion. Further conceptual and empirical research is needed to clarify this issue.

7.2 There is a statistically significant difference in the degree of Field-Dependence-Independence between adults studying in courses of education and the helping professions and adults studying in courses of mathematics and the natural sciences. There is also a statistically significant main effect of the type of subject matter on the degree of FI. Adult students in courses of mathematics and the natural sciences are significantly more FI than adult students in courses of education and the helping professions. This clearly has implications for different curricular areas and

program objectives.

From these findings two categories appear to be of special importance for future research. First, research endeavors must clarify whether differences in the degree of FD or FI exist between learners in other program areas, such as business education or engineering. This research endeavor must also clarify whether or not differences are observed and bear significant implications in educational settings other than formal institutions, such as community education, staff development enterprises and leisure courses. Second, research efforts must look at the phenomenon of SDL in natural societal settings, identify the subject matter areas which are chosen by learners, and verify whether or not they reflect individual differences in cognitive style.

8) Sex

8.1 There is no statistically significant difference in the level of readiness to self-directed learning between male and female adult students. This stands in contrast to the results reported by Sabbaghian (1979), who concluded that females are more self-directed than males. Therefore, further research on sex differences appears to be necessary.

8.2 There is a statistically significant difference in the level of field-dependence-independence between male and female adult students. Males are more field-independent than females.

Although the literature on FDI did not suggest in a conclusive manner that females are more FD (cf. Goldstein and Blackman, 1978; Kirby, 1979), the results of this study provide clear evidence that females are, indeed, more FD. Further research is needed to verify the source of such differences, and to explore ways which would minimize their effect on educational performance.

9) Age

9.1 There are no statistically significant differences in the level of readiness to self-directed learning between adult students of various age groups. This finding is encouraging to adult educators in suggesting that the age of adult learners alone may not predict their level of self-directedness in learning. Those adult educators who are interested in encouraging students to be self-directed need not worry that just because they work with adults who are beyond the traditional schooling age, they should expect to meet individuals and groups who are less prepared for SDL. However, data available to date are still preliminary and as is the case in the study of human behaviour and aging, further research is still needed. One area which such research may address is that of the relationship between self-directedness in learning on the one hand, and amount of schooling and age on the other. The question that may be asked is whether it is the educational attainment or the socio-economic circumstances (e.g., employment) that leads them to be more prepared to SDL. Another

possibility which must be addressed by further reaseach is that of a plateau in the level of readiness to self-directed learning which may be reached at a certain age. Various cross sectional and longitudinal research designs (e.g., Botwinick, 1978) which are properly and carefully planned may address these issues.

9.2 There is no statistically significant difference in the degree of field-dependence-independence between adult students of various age groups. The results of the four-way analysis of variance which considered the interaction between all variables reinforces this conclusion. Thus, the results of the present investigation suggest that the age of adult students by itself may not provide sufficient information about the expected degree of FDI that a group or an individual would manifest. However, there appears to be a relationship between the educational level attained by learners and their degree of FI, suggesting that it is education, rather than age which may influence greater field-independence (cf. Kogan, 1973).

General Conclusions and Recommendations

In addition to the specific conclusions and recommendations which are derived directly from the testing of each hypothesis alone, the results of the present investigation also appear to offer some general conclusions and recommendations. These are presented in the following section.

1) Guidelines for Adult Education Practice

1.1 While supporting the findings of previous investigations on self-directedness in learning (e.g, Brockett, 1983, 1984a, 1984b, 1985b; Sabbaghian, 1979), and in light of the implications of the FDI theory, the results of the present investigation suggest that adult educators in formal educational settings ought to consider the unique characteristics of the population with which they are working, and the curricular area taught. Thus, for example, it is likely that populations in lower educational levels, women, and people in social science and helping professions programs would be more FD, and perhaps less self-directed.

1.2 It appears that encouraging SDL practice in the format suggested by Knowles (1975, 1980, 1984) in formal instructional settings may put the adult learner who is relatively more FD at a disadvantage (cf. Witkin et al., 1977). In order to prevent the FD learner from being at a disadvantage in these settings, the FDI theory appears to suggest that there are two elements which must be considered:
a) A clear cognitive framework and organized structure in instructional situations (for example, outlines to be communicated and followed, a clear cognitive framework regarding the body of knowledge, clear and systematic presentations of concepts and cues, modelling and feedback).
b) Experiential learning approaches which provide an opportunity for individual experimentation, group discussion,

interpersonal interaction and personal attention and feedback.

The relative proportion or emphasis that each of these elements would assume may vary according to the following: a) The extent to which the learners are perceived to be FD or FI. b) The requirements of the situation including its goal and objectives, the subject matter which is being taught and the educational level of students.

Elias and Merriam (1980) have identified 5 approaches to teaching adults. The findings of this investigation suggest that no one method alone is useful. Instead. it appears that a flexible combination of liberal, (traditional), progressive and humanistic approaches (Elias & Merriam, 1980) to the teaching of adults in formal instructional settings is preferred. Further research must address these components and clarify their usefulness in various settings and with different learners.

1.3 The results of the present study suggest a gradual approach to the development of greater self-directedness in learning. This approach must take into account the level of readiness for SDL of adult learners and the degree of field-dependence-independence that these individuals seem to manifest. This information may be used to design educational experiences which gradually allow learners to assert more independence in educational activities.

1.4 The results of this study suggest that specific training in analysis and cognitive restructuring may be helpful in the

development of greater self-directedness in learning. The literature on FDI has offered several specific areas on which such training may focus, such as the development of one's capacity to distinguish between relevant and irrelevant cues in concept learning or active hypothesis-testing (e.g. Goodenough, 1976; Witkin et al., 1977). Research aiming at the development of such an approach and the testing of its effectiveness with various populations of adult learners is recommended.

2) Self-Directed Learning Theory and Research

The present study addressed one of the most central concepts in adult education theory. The complexity of this concept and its unclear meaning emerge as primary targets for future research.

2.1 This investigation appears to confirm that there are individual differences in capacity to engage in SDL activities (cf. Kasworm, 1983a, 1983b). However, one question which needs to be asked is whether it is realistic or desirable to conceive all adult learners as manifesting the same skills and competencies under all circumstances (cf. Candy, 1985b).

2.2 Also evident in the literature is the lack of a clear definition of SDL structures, which makes it impossible to delineate the requirements and limitations of specific SDL situations and expectations from learners. A clearer delination of SDL structures would assist future

research.

2.3 The lack of a clear definition and relevant information of SDL may stimulate thinking in another direction. Spear & Mocker (1984) appear to suggest that studying SDL from a perspective which considers only learner characteristics and behaviours without regard to the effect of situations is inherenly limited. This suggests that self-directedness is not necessarily an enduring personality trait that would manifest itself regardless of situational variables. It implies that an adult may behave in a self-directed manner in one situation and not so in another. Perhaps what is needed is an extended theoretical framework in which the two axes of learner characteristics on the one hand and learning situations on the other are considered (cf. Moore, 1972, 1976, 1980). There may then be a need to closely examine the interaction between learner characteristics and situational variables. Such an approach may also prove meaningful in the study of cognitive style in general, and FDI in particular.

2.4 Another direction for further research which may prove fruitful is concerned with the motivation of learners to engage in a learning activity and its relationship to their degree of self-directedness in learning or their cognitive style. It may be that the learner's goal tends to affect his/her approach to a situation and the characteristics of the learning process that he or she might

then pursue. Thus, for example, it may be that the solution to a specific practical problem would entail a field-independent-analytic, pre-planned approach to learning (cf. Tough, 1967, 1979), whereas leisure time learning may entail a more field-dependent learning approach (cf. Danis & Tremblay, 1985; Theil, 1984). Further research is needed to clarify this issue.

2.5 Related to these is another conceptual problem. There is still no consensus about what has been meant by adult educators when they use the term Self-Directed Learning. (e.g., Fellenz, 1985). Nevertheless, the concept has assumed a central stance in adult education theory to the extent that it has become identified with the field (Brookfield, 1985a). A clear delineation of what is meant by SDL is necessary. On the basis of this investigation, including the review of the literature, it appears that SDL may best be understood as a metaphor which is used at times to lend meaning to complex phenomena (cf. Candy, 1985a). Adult educators, however, are having to face the need to be more specific about their referents in order to promote scientific rigor and clarity in the discourse. In facing this problem, the question which is asked is whether adult educators are required to use the term self-directed learning or if alternative terms may be useful. Conceptual research in this direction has already begun (e.g., Boshier, 1983; Chêne, 1983; Fellenz, 1985), but it must continue

to address this issue.

3) Adult Education Theory and Research

3.1 This study indicates that the same general characteristics and intervening variables related to FDI that were observed among samples of younger students are observed among a mixed population of students of traditional age and older students, across a broad spectrum of formal educational levels. However, it might be beneficial to study this variable among populations who had completed less than 10 years of schooling. The study of learners in other educational settings, formal, informal and non formal, may also prove worthwhile.

3.2 Future research endeavors must address the development of effective educational methods which enhance the learning of FD and FI individuals respectively.

3.3 The usefulness of the construct of field-dependence-independence in describing individual differences in readiness to self-directed learning among adult learners has been demonstrated by the present investigation. It may be that other cognitive and learning style constructs also provide useful information about readiness to self-directed learning in particular and adult learning in general. Further research using cognitive and learning style theory is recommended.

3.4 This study also indicates that instead of prescribing an all-encompassing set of principles for practice, an effort

must be made to develop a more flexible set of guidelines for adult educators. Thus, it appears that further research must aim at developing a theoretical framework which considers learner differences and different educational contexts, objectives and methods at the same time. Further research on cognitive styles may provide one useful theoretical framework.

3.5 At last, the findings of the present study suggest that it is to the advantage of adult educators and adult learners alike to undertake the close examination of adult learning theory. First, this study provided additional empirical evidence suggesting that not all adults are highly self-directed or can benefit from highly self-directed learning situations. Secondly, this study indicated that the same individual differences in cognitive style which were observed among children, adolescents and traditional college age students are also observable among adult students. Third, age did not appear to be related to any of the variables investigated in the present study. These findings appear to contradict some of the common beliefs regarding the uniqueness of adults as learners (e.g., Knowles, 1984). Therefore, future research should examine what is the nature of the relationship between adult learning theory and the wide realm of learning theories which were described by psychologists. The most pertinent question which needs to be asked may be stated as follows: Is there a difference between the learning

process of adults and the learning process of children? (cf. Dubin & Okun, 1973). The debate in this area has already begun (e.g., Elias, 1979; Kasworm, 1983a; Knowles, 1979; Knudson, 1979; Mckenzie, 1977, 1979). However, in the realm of learning psychology, much more work still needs to be conducted. Conceptual, philosophical and empirical investigations may contribute to further understanding.

Limitations

This study attempted to further knowledge and theory building about the relationship between readiness to self-directed learning and FDI. The information gained through this investigation suggested that adult learners in various settings must be approached from a perspective addressing individual differences in FDI and in self-directedness in learning. However, the results of this study are limited in several respects and require some caution in their interpretation.

Setting out to be an exploratory investigation with a relatively small sample, the findings of this study alone do not suffice to formulate generalizations about readiness to SDL and FDI. Because the sample of the population in this study was not drawn in a completely random fashion, the results of this study do not permit the generalization of findings to the broad universe of all adults engaged in learning activities. Adults observed in this study were drawn from among those

engaged in studying two distinct categories of subject matter in institutions of pre-university and of higher education. This fact also does not permit even the generalization of findings into the universe of all students in institutions of higher and post-secondary education. The study of adult learners in other types of educational environments and other personal and educational backgrounds requires additional investigations. The need for a sample which includes more adults who are over 25 is also evident. Nevertheless, this is a first step towards an understanding of this relationship and it augmented our information regarding personality correlates of readiness to SDL. In particular, it added information about cognitive aspects related to SDL.

Within a multicultural society such as the one that exists in Montreal, special attention must also be given to the cultural and linguistic background of the sample population. The findings of this study are limited to those adult students in the English-speaking educational institutions in Montreal. Until further investigations are conducted, the results of this research may not apply to adults from other geographical regions and other cultural or linguistic backgrounds. Further research of readiness to self-directed learning in a multi-cultural/multi-lingual context also appears to be necessary.

In an observational study, researchers are limited in their ability to manipulate the conditions of the

investigation. An ultimate conclusion regarding the effect of any of the variables on readiness for SDL can not be reached. However, data gathered through this study may serve to describe how the variables are related to self-directedness, and they help in eliciting factors that deserve further observation or special attention. One such observation which is required is concerned with additional multivariate and factor analytic studies of the SDLRS.

The last factor that may limit the conclusions drawn from this research concerns the nature of the measuring instruments. Due to the self-report nature of the SDLRS, subjects who attempted to deceive the researcher might have succeeded in doing so. However, until a more objective method is to be devised to identify readiness to SDL, the only measurement that was available for the purpose of this investigation is the SDLRS.

In conclusion, this study was stimulated by suggestions from the literature that the construct of FDI cognitive style may be useful for describing individual differences in readiness to SDL and furthering a theory on adult learning. As an exploratory investigation, this study fulfilled its primary purpose. Although limited in its implications, it offers some guidelines for adult education practioners and several avenues for further research.

REFERENCES

Adcock, C.J., & Webberley, M. (1971). Primary mental abilities. Journal of General Psychology, 84, 229-243.

Anderson, S.B., Ball, S., Murphy, R.T., & Associates.(Eds). (1975). Encyclopedia of educational evaluation. San Francisco: Jossey-Bass Publishers.

Armstrong, D. (1971). Adult learners of low educational attainment: The self-concepts, backgrounds, and educative behavior of average and high learning adults of low educational attainment. Unpublished doctoral dissertation, University of Toronto.

Ausubel, D.P. (1968). Educational psychology: A cognitive view. New York: Holt, Rinehart and Winston.

Bertinot, E.A. (1978). Choice of learning format as a function of three constructs: Personality variables, cognitive style and locus of control. Dissertation Abstract International, 39, 1990A.

Bigelow, G.S., & Egbert, R.L. (1968). Personality factors and independent study. Journal of Educational Research, 62(1), 37-39.

Birren, J.E., & Woodruff, D.S. (1973). Human Development over the life span through education. in: B.P. Baltes, & Warner K. Schaie (Eds.), Life span developmental psychology (pp.305-337). New York: Academic Press.

Boshier, R. (1983, April). Adult learning projects research: An alchemist's fantasy. Invited address to the American Educational Research Association. Montreal, Canada..

Botwinick, J. (1978). Aging and behavior - A comprehensive integration of research findings. (2nd ed.) New York: Springer Publishing Company Inc.

Boud, D. (Ed.). (1981). Developing student autonomy in learning. London: Kogan Page.

Brockett, R.G. (1982). Self-directed learning readiness and life satisfaction among older adults. Dissertation Abstracts International, 44(01), 42A.

Brockett, R.G., (1983, February). The relationship between life satisfaction and self-directedness among older adults. Paper presented at Lifelong Learning Research Conference, College Park, M.D.

Brockett, R.G. (1984a, April). Methodological and substantive issues in the measurement of self-directed-learning. Proceedings of the 25th Annual Adult Education Research Conference, (p. 283), Raleigh, N.C.

Brockett, R.g. (1984b). Self-directed learning and the hard to reach adult. Lifelong Learning:the Adult Years, 7(6), 16-18.

Brockett, R.G. (1985a). A response to Brookfield's critical paradigm of self-directed adult learning. Adult Education Quarterly, 36(1), 55-59.

Brockett, R.G. (1985b). The relationship between self-directed learning readiness and life satisfaction among older adults. Adult Education Quarterly, 35(4), 210-219.

Brookfield, S. (1980). The nature of independent adult learning. Continuing education, (3).

Brookfield, S. (1981). Independent adult learning. Studies in Adult Education, 13(1), 15-27.

Brookfield, S. (1982, April). Successful independent learning of adults of low educational attainment in Britain: A parallel educational universe. Proceedings of the 23rd Annual Adult Education Research Conference (pp.48-53), Lincoln, NE:Department of Adult and Continuing Education, Univeristy of Nebraska-Lincoln.

Brookfield, S. (1983). Independent learners and correspondence students. Teaching At A Distance 22, 26-33.

Brookfield, S. (1984). Self-directed adult learning: A critical paradigm. Adult Education Quarterly, 35(2), 59-71.

Brookfield, S. (1985a). Self-directed learning: A conceptual and methodological exploration. Studies in the Education of Adults, 17, 1, 19-32.

Brookfield, S. (1985b). Self-directed learning: A critical review of research. In S. Brookfield (Ed.), New direction for continuing education, no. 25: Self-directed learning: from theory to practice (pp 5-17). San Francisco: Jossey-Bass.

Brundage, D.H., & Mackereacher, D. (1980). Adult learning principles and their application to program planning. Toronto: Ontario Ministry of Education.

Caffarella, R.S. (1983, February). The learning plan format: A technique for incorporating the concept of learning how to learn into formal courses and workshops. Paper presented at Lifelong Learning Research Conference. College Park, MD.

Candy, P.C. (1985a, March). Microscope or telescope: The place of metaphor in adult education research. Proceedings of the 26th Higher and Adult Education Research conference, (pp. 69-74). Tempe, AZ: College of Education, Arizona State University.

Candy, P.C. (1985b). The ideology of autonomous learning. Paper presented at the 4th Annual Conference, the Canadian Association for the Study of Adult Education. Montreal, Canada.

Cawly, R.W.V., Miller, S.A., & Milligan, J.N. (1976). Cognitive styles and the adult learner. Adult Education, (Washington) 28(28), 101-116.

Chêne, A. (1983). The concept of autonomy in adult education: A philosophical discussion. Adult Education Quarterly, 34(1), 38-47.

Child, D. (1970). Essentials of factor analysis. London: Holt, Rienhart and Winston.

Commission d'étude sur la formation des adultes. (1982). Learning: A voluntary and responsible action - Statement of a comprehensive policy for adult education. (summary report in English) Montréal: Government du Québec.

Cross, K.P. (1976). Accent on learning. San Francisco: Jossey-Bass.

Cross, K.P. (1981). Adults as learners. San Francisco: Jossey-Bass.

Danis, C., & Tremblay, N. (1985, March). Critical analysis of adult learning principles from a self-directed learner's perspective. Proceedings of the 26th Annual Higher and Adult Education Research Conference, (pp. 137-143). Tempe, AZ.:College of Education, Arizona State University.

Darkenwald, G.D., & Merriam, S.B. (1982). Adult education: Foundations of practice. New York: Harper & Row.

De Cosmo, R.D., (1977). A study of field dependence-independence, selected curricular choices and preferred guidance strategies of adult, evening community college students. Dissertation Abstracts International, 1977, 38, 112A.

Dickstein, L.S. (1968). Field independence in concept attainment. Perceptual and Motor Skills. 27, 635-642.

Dressel, P.L., & Thompson, M.M. (1973). Independent study: A new interpretation of concepts, practices and problems. San Francisco: Jossey-Bass.

Dubin, S.S., & Okun, M. (1973). Implications of learning theories for adult instruction. Adult Education (Washington) 24(1), 3-19.

Eagle, M., Goldberger, L., & Breitman, M. (1969). Field dependence and memory for social vs. neutral and relevant vs. irrelevant incidental stimuli. Perceptual and Motor Skills, 28, 903-910.

Eagle, M., Fitzgibbons, D., & Goldberger, L. (1966). Field dependence and memory for irrelevant identical stimuli. Perceptual and Motor Skills, 23, 1035-1038.

Elias, J. (1979) Andragogy revisited. Adult Education (USA). 29(4), 252-255.

Elias, J.L., & Merriam, S. (1980). Philosophical foundations of adult education. Huntington, New York: Krieger Publishing Co.

Even, M.J. (1982). Adapting cognitive style theory into practice. Lifelong Learning: The Adult Years. 5(5), 14-17, 27.

Even, M.J. (1984, April). Adult learned disabilities. Proceedings of the 25th Annual Adult Education Research Conference, (pp. 279-281). Raleigh, NC.: Departments of Adult and Communtiy college Education, North Carolina State University.

Even, M.J. (1985, March). Adult classroom locus of control. Proceedings of the 26th Annual Higher and Adult Education Research Conference. Tempe, AZ.: College of Education, Arizona State University.

Fellenz, R.A. (1985, March). Self direction: A clarification of terms and causes. Proceedings of the 26th Annual Higher and Adult Education Research Conference, (pp. 163-169). Tempe, AZ: College of Education, Arizona State University.

Faure, E., Herra, F., Kaddoura, A.R., Lopes, H., Petrvoski, A., Rahnema, M., & Ward, F. (1972). Learning to be: The world of education today and tomorrow. Paris, France: United Nations Educational, Scientific and cultural Organization.

Fitz, R.J. (1971). The differential effects of praise and censure on social learning as dependent on locus of control and field dependency. Dissertation Abstracts International, 31, 431-B.

Fitzgibbons, D., Goldberger, L., & Eagle, M. (1965). Field dependence and memory for incidental material. Perceptual and Motor Skills, 21, 743-749.

Fox, R.D., & West R.W., (1983, April). Personality traits and perceived benefits associated with different approaches of medical students to self-directed learning projects. Proceedings of the 24th Annual Adult Education Research Conference, (pp. 99-104). Montreal, Canada: Concordia University and Université de Montréal.

Gibbons, M., Bailey, A., Comeau, P., Schmuck, J., Seymour, S., & Wallace, D. (1980). Toward a theory of self directed learning: A study of experts without formal training. Journal of Humanistic Psychology, 20(2), 41-56.

Glaser, R. (1977). Adaptive education: Individual diversity in learning. New-York: Holt, Rinehart & Winston.

Goldberger, L., Bendich, S. (1972). Field dependence and social responsiveness as determinants of spontaneously produced words. Perceptual and Motor Skills, 34, 883-886.

Goldstein, K.M., & Blackman, S. 1978). Cognitive Style: Five approaches and relevant research. New York: John Wiley & Sons.

Good, C.V. (Ed.). (1973). Dictionary of education. New York: McGraw Hill.

Goodenough, D.R. (1976). The role of individual differences in field dependence as a factor in learning and memory. Psychological Bulletin, 83, 675-694.

Griffin, V. (1980). Self-directed adult learners and learning. In P.M. Cunningham (Ed.), Yearbook of adult and continuing education 1980-1981, sixth edition (pp. 501-507). Chicago: Marquis Academic Media.

Guglielmino, L.M. (1977). The development of the self-directed learning readiness scale. Dissertation Abstracts International, 38, 6467A. (University Microfilms No. 78-6004).

Guglielmino, L.M. (1982). Self-directed learning readiness scale. Boca Raton, FLA: Guglielmino and Associates.

Guilford, J.P. (1980). Cognitive styles: What are they. Educational and Psychological Measurement, 40(3), 715-735.

Harrison, R. (1978). How to conduct and design self-directed learning experiences. Group and Organization Studies, 3(2), 149-167.

Hassan, A.M. (1981). An investigation of the learning projects among adults of high and low readiness for self-direction in learning. Dissertation Abstracts International, 42(09), 3838A - 3839A.

Hawk, P.P. (1983). Effects of graphic organizers upon the learning of field-dependent and field-independent undergraduate students. Dissertation Abstracts International, 43(12), 3887A.

Herning, J.G. (1976). A multivariate analysis of the relationship of field-dependence-independence cognitive style to learning of geographical concepts and information among college students. Dissertation Abstracts International, 37, 5700A - 5701A.

Hiemstra, R. (Ed.). (1980). Policy recommendations related to self-directed learning. (Occasional paper No. 1). New York: Syracuse University. (ERIC document Reproduction Service No. ED 198304)

Houle, C.O. (1972). The design of education. San Francisco: Jossey-Bass.

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

Kasworm, C.E. (1983b, April). Towards a paradigm of developmental levels of self-directed learning. Paper presented at the American Education Research Association. Montreal, Canada.

Kerlinger, F.N. (1973). Foundations of behavioral research. Chicago: Holt, Rinehart & Winston.

Kirby, P. (1979). Cognitive style, learning style and transfer skill acquisition. Columbus, OH: National Center for Research in Vocational Education.

Kirschenbaum, J. (1969). Analytic-global cognitive style and concept attainment strategies. Dissertation Abstracts International, 29, 4868B - 4869B.

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

Knowles, M.S. (1975). Self-directed learning: A guide for learners and teachers. Chicago: Follett Publishing Company.

Knowles, M.S. (1978). The adult learner: A neglected species. (2nd ed.). Huston: Gulf Publishing Company.

Knowles, M.S. (1979). Andragogy revisited part II. Adult Education (Washington), 30(1), 52-53.

Knowles, M.S. (1984). Andragogy in action. San Francisco: Jossey-Bass.

Knudson, R.S. (1979). Humanagogy anyone? Adult Education (Washington), 29(4), 261-263.

Knox, A.B. (1977). Adult development and learning. San Francisco: Jossey-Bass.

Kogan, N. (1971). Educational implications of cognitive styles. In: G.S. Lesser. (Ed.), Psychology and educational practice. Glenview, Ill: Scott, Foresman and Company.

Kogan, N. (1973). Creativity and cognitive style: A life span perspective. In: P.B. Baltes, & K.W. Schaie (eds.), Life span developmental psychology: personality and socialization. New York: Academic Press.

Konstad, N., & Forman, E. (1965). Field-dependence and external directedness. Journal of Personality and Social Psychology, 1, 490- 493.

Koran, M.L., Snow, R.E., & McDonald, F.J. (1971). Teacher aptitude a nd observational learning of a teaching skill. Journal of Educational Psychology, 62, 219-228.

Lehman, T. (1976). Educational outcomes from contract learning at Empire State College. (ERIC Document Reproduction Service No. ED 111306).

Long, H.B., & Agyekum, S.K. (1983). Guglielmino's self-directed learning readiness scale: a validation study. Higher Education, 12, 77-87.

Long, H.B., & Agyekum, S.K. (1984, April). Multi-trait multi-method validation of Guglielmino's self-directed learning readiness scale. Proceedings of the 25th Annual Adult Education Research Conference, (pp. 272-278). Ralaigh, N.C.: Department of Adult and Community College Education, North Carolina State University.

Loveall, (1979). The relationship between cognitive style and achievement as measured by the old and new forms of the GED. Dissertation Abstracts International, 40(05), 2411-A.

Maloney, T.J. (1981) The relation between field-independence and rule transfer. Dissertation Abstracts International, 42(06), 2575A.

Marchese, F.J. (1977). The Effect of interaction between global and analytic cognitive style and two methods of instruction on performance and interest in a learning situation. Dissertation Abstracts International, 39, 1441A.

Martens, K.J. (1976). A discriptive study of the cognitive style of field dependence independence in the new student population in the community college. Albany: State University of New York. (ERIC Document Reproduction Service No. ED 140873)

Martin, J. (1984). Toward a cognitive schemata theory of self-instruction. Instructional Science, 13, 159-180.

Mckenzie, L. (1977). The issue of Androgogy. Adult Education (USA), 27(4), 225-229

Mckenzie, L. (1979). A response to Elias. Adult Education (USA), 29(4), 256-260.

Messick, S. (1976). Personality consistencies in cognition and creativity. In S. Messick (Ed.), Individuality in learning (pp. 4-22). San Francisco: Jossey-Bass.

Messick, S. (1979). Potential uses of noncognitive measurements in education. Journal of Educational Psychology, 71(3), 281-292.

Messick, S. (1984). The nature of cognitive styles: Problems and promise in educational practice. Educational Psychologist, 19(2), 59-74.

Messick, S., & Damarin, F. (1964). Cognitive style and memory for faces. Journal of Abnormal and Social Psychology, 69, 313-318.

Mezirow, J. (1981). A critical theory of adult learning and education. Adult Education (Washington), 32(1), 3-24.

Mocker, D.W., & Spear, G.E. (1982). Lifelong learning: Formal, informal, nonformal and self-directed. Information series No. 241, ERIC clearinghouse on Adult, Career and Vocational Education. Columbus: OH. (ERIC Document Reproduction Service No. ED 182465).

Moore, M.G. (1972). Learner autonomy: The second dimension of independent learning. Convergence, 5, 76-87.

Moore, M.G. (1976). Investigation of interaction between the cognitive style of field independence and attitudes to independent study among adult learners who use correspondence study and self directed independent study. Dissertation Abstracts International, 37, 3344A. (University Microfilms No. 76-20,127).

Moore, M.G. (1980). Independent study. In R.D. Boyd and J.W. Apps (Eds.), The adult education association handbook series in adult education: Redefining the discipline of adult education. (pp 16-31). San Francisco: Jossey-Bass.

Morable, L.R. (1983). A comparative analysis of the cognitive styles and self-concepts of developmental and non-developmental students in selected Florida communtiy colleges. Dissertation Abstracts International, 44(2), 358A-359A.

Morstain, B.R. (1974). Students who desire independent study: Some distinguishing characteristics. College Student Journal, 8(4), 85-92.

Nebelkoph, E.B., & Dreyer, A.S. (1973). Continuous-discontinuous conceptual style. Perceptual and Motor Skills, 36, 635-639.

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(04), 2002A.

Nevill, D.D. (1972). Experimental manipulation of dependence motivation and its effects on eye contact and measures of field dependency. Dissertation Abstracts International, 32, 7295B.

Nie, H.H., & Hull, C.H. (1981). SPSS update 7-9: New procedures and facilities for releases 7-9. New York: McGraw-Hill Book Company.

Nie, N.H., Hull, C.H., Jenkins, G., Steinbrenner, K., & Brent, D.H. (1975). Statistical package for the social sciences (SPSS), New York: McGraw-Hill Book Company.

Oltman, P.K., Goodenough, D.R. Witkin, H.A., Freedman, N., & Friedmen, F. (1975). Psychological differentiation as a factor in conflict resolution. Journal of Personality and Social Psychology, 32, 730-736.

Oltman, P.K., Raskin E., & Witkin, A. (1971), Group embedded figures test. Palo Alto: Consulting Psychologists Press.

Paclisanu, M.I. (1970). Interacting effects of field dependence, stimulus deprivation and two types of reinforcement upon problem solving in elementary school children. Dissertation Abstracts International, 31. 2290B -2291B.

Penland, P.R. (1977). Self planned learning in America: Final report. Pittsburgh, PA: University of Pittsburgh. (ERIC Document Reproduction Service No. ED 184589).

Penland, P.R. (1981). Towards Self-directed Learning Theory. (ERIC Document Reproduction Service No. ED 209 475).

Peterson, D.A., & Eden, D.Z. (1981). Cognitive styles and the older learner. Educational Gereontology, 7(1), 57-66.

Peterson, H.S. (1981). Learning and attitudinal effects produced by teaching field dependent and field independent teacher education students using printed study materials designed for these cognitive styles. Dissertation Abstracts international, 42(01), 26A.

Powell, M.C. (1976). The relationship of cognitive style, achievement and self concept to an indicated preference for self-directed study. Dissertation Abstracts International, 37, 3383A.

Pratt, D.D. (1984, April). Andragogical assumptions: Some counterintuitive logic. Proceedings of the 25th Annual Adult Education Research Conference, (pp 147-153). Raleigh, NC.: Department of Adult and Community college Education, North Carolina State University.

Remley, A.W. (1974) Cognitive style and response to learning experiences. Dissertation Abstracts International, 36, 151A.

Renzi, N.B. (1974) A study of some effects of field dependence-independence and feedback on performance achievement. Dissertation Abstracts International, 35, 2059A.

Rittner, S. (1981). An experimental study of field dependence/independence and abstract/concreteness of presentation in promoting achievement. Dissertation Abstracts International, 42(06), 2453-A.

Ruble, D.N., & Nakamura, C.Y. (1972). Task orientation versus social orientation in young children and their attention to relevant social cues. Child Development, 43, 471-480.

Sabbghian, Z. (1979). Adult self-directedness and self concept: An exploration of relationship. Dissertation Abstracts International, 40(07), 3701A-3702A. University Microfilms No. 8000 170).

Savoie, M.L. (1979). Continuing education for nurses: Predictors of success in courses requiring a degree of learner self-direction. Dissertation Abstracts International, 40, 6114A.

Schwen, T.M. (1970). The effect of cognitive styles and instructional sequences on learning a hierarchical task. Dissertation Abstracts International, 31, 2797A - 2798A.

Simpson, E.L. (1980). Adult learning theory: A state of the art. Washington, D.C.: Department of Health, Education and Welfare.

Simpson, E.L. (1981 April). A study of learning strategies used by cognitively field dependent academically successful mature learners. Proceedings of the 22nd Annual Adult education Research Conference, (pp. 199-204). De Kalb, Il.: Northern Illinois University.

Simpson, E.L., & Brenneke. (1977). Needed research in adult continuing education: An exploration. Paper prepared for the Task Force on Needed Research of the Commission of Professors of Adult Education meeting.

Simpson, E.L., & Walker, S.N. (1983). Qualitative differences between field-dependent and field-independent nursing students' perceptions of learning experiences and learning patterns. Proceedings of the 24th Annual Adult Education Conference, (pp. 205-210). Montreal, Quebec, Canada: Concordia University and Universite de Montreal.

Skager, R. (1978). Lifelong learning and evaluation practice. Hamburg: UNESCO Institute for Education.

Skaggs, B.J. (1981). The relationship between involvement of professional nurses in self-directed learning activities, loci of control, and readiness for self-directed learning measures. Dissertation Abstracts International, 42, 1906A.

Smith, R.M. (1982). Learning how to learn: Applied theory for adults. Chicago: Follett Publishing Company.

Smith, R.M. (1984, April) Adult instructional process and self-directedness: Some research issues. Proceedings of the 25th Annual Adult Education Research Conference, (p. 284). Raleigh, NC.: Department of Adult and Community College Education, North Carolina State University.

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

Stasz, C., Shavelson, R.J., Cox, D.L., & Moore, C.A. (1976). Field independence and the structuring of knowledge in a social studies minicourse. Journal of Educational Psychology, 68, 550-558.

Steinfeld, S.L. (1973). Level of differentiation and age as predictors of reinforcer effectiveness. Dissertation Abstracts International, 34, 2912 - 2913B.

Stone, M.K. (1982). Teacher adaptation to student cognitive style and its effect on learning. Dissertation Abstracts International, 42(07), 3083A.

Theil, J.P. (1984). Successful self-directed learners' learning styles. Proceedings of the 25th Annual Adult Education Research Conference, (pp 237-242). Raleigh, NC.: Department of Adult and Community College Education, North Carolina State University.

Thesaurus of ERIC Descriptors. (1982). (9th ed.). Phoenix, AZ: Oryx Press.

Titmus, C., Buttedahl, P., Ironside, D., & Legrand, P. (1979). Terminology of adult education. Paris, France: United Nations Educational, Scientific and Cultural Organization.

Tootle, A.E. (1985, March). An analysis of the relationship between cognitive style (field dependence-field-independence) and level of learning. Proceedings of the 26th Higher and Adult Education Research Conference, (pp. 295-301). Tempe, AZ: College of Education, Arizona State University.

Torrance, E.P., & Mourad, S. (1978a). Self-directed learning readiness skills of gifted students and their relationship to thinking creatively about the future. The Gifted Child Quarterly, 22(2), 180-186.

Torrance, E.P., & Mourad, S. (1978b). Some creativity and style of learning and thinking correlates of Guglielmino's self-directed learning readiness scale. Psychological Reports, 43, 1167-1171.

Tough, A.B. (1967). Learning without a teacher. Toronto: The Ontario Institute for Studies in Education.

Tough, A. (1971). The adult's learning projects. Toronto: Ontario Institute for Studies in Education.

Tough, A. (1978). Major learning efforts: Recent research and future directions. Adult Education (Washington), (28)4, 250-263.

Tough, A. (1979). The adult's learning projects: A fresh approach to theory and practice in adult learning. (2nd. ed.). Toronto: The Ontario Institute for Studies in Education.

Tough, A. (1980). Individual learning In: R.D. Boyd and J.W. Apps. (Eds.), The adult education association handbook series on adult education: Redefining the discipline of adult education pp. 32-43. San Francisco: Jossey-Bass.

Walker, S.N. (1981). The relationship of field dependence-independence to learning approach and achievement of associate degree nursing students. Dissertation Abstracts International, 42(06), 2444A. (University Microfilms No. 81-2251).

Walker, S.N. (1982, April). The relationship of field dependence-independence to learning approach and achievement of associate degree nursing students. Proceedings of the 23rd Annual Adult Education Research Conference, (pp 221-226). Lincoln, NE.: Department of Adult and Continuing Education, University of Nebraska-Lincoln.

Wardell, D.M., & Royce, J.R. (1978). Toward a multi-factor theory of styles and their relationships to cognition and affect. Journal of Personality, 46, 474-505.

Wiley, K.R. (1981). Effects of a self-directed learning project and preference for structure on the self-directed learning readiness of baccalurate nursing students. Dissertation Abstracts International, 43(01), 49A-50A.

Wiley, K.R. (1982, April). Effects of a self-directed learning project and preference for structure on self-directed learning readiness. Proceedings of the Twenty Third Annual Adult Eudcation Research Conference, (pp 227-232). Lincoln, NE.: Department of Adult and Continuing Education, University of Nebraska-Lincoln.

Witkin, H.A. (1950). Individual differences in ease of perception. Journal of Personality, (19), 1-15.

Witkin, H.A. (1952). Further studies of perception of the upright when the direction of the force acting on the body is changed. Journal of Experimental Psychology, 43, 9-23.

Witkin, H.A. (1976). Cognitive style in academic performance and in teacher student relations. In Messick (Ed.) Individuality in learning (pp 38-72). San Francisco: Jossey-Bass.

Witkin, H.A. (1978). Cognitive styles in personal and cultural adaptation. Worchester, Mass: Clark University Press.

Witkin, H.A., Dyk, R.B., Faterson, H.F., Goodenough, D.R., & Karp, S.A. (1974). Psychological differentiation. Potomac, Md.: Erlbaum, 1974. (originally published: Wiley, 1962).

Witkin, H.A., & Goodenough, D.R. (1981). Cognitive styles: Essence and origins. New York: International Universities Press.

Witkin, H.A., & Goodenough, D.R. (1977). Field dependence and interpersonal behavior. Psychological Bulletin, 84, 661-689.

Witkin, H.A., Goodenough, D.R., & Oltman, P.K. (1979). Psychological differentiation: current status. Journal of Personality and Social Psychology, 37, 1127-1145.

Witkin, H.A., Lewis, H.B., Hertzman, M., Machover, K., Meissner, P.B., & Wapner, S. (1972). Personality through perception. Westport, Conn: Greenwood Press. (originally published: Harper & Row, 1962).

Witkin, H.A., Moore, C.A., Goodenough, D.R., & Cox, P.W. (1977). Educational implications of cognitive styles. Review of Educational Research, (41), 1-64.

Witkin, H.A., Moore, C.A., Oltman, B.k., Goodenough, D.R., Friedman, F., Owen, D.R., Raskin, E. (1977). role of field-dependent and field independent cognitive styles in academic evolution: a longitudinal study. Journal of Educational Psychology, 69, 197-211.

Witkin, H.A., Oltman, P.K., & Raskin, E., & Karp, S. A. (1971). A Manual for the embedded figures tests. Palo Alto: Consulting Psychologists Press.

Appendix A

Self-Directed Learning Readiness Scale

Name _____ Sex _____ Birthdate _____

Date of Testing _____ Location of Testing _____

QUESTIONNAIRE

INSTRUCTIONS: This is a questionnaire designed to gather data on learning preferences and attitudes towards learning. After reading each item, please indicate the degree to which you feel that statement is true of you. Please read each choice carefully and circle the number of the response which best expresses your feeling.

There is no time limit for the questionnaire. Try not to spend too much time on any one item, however. Your first reaction to the question will usually be the most accurate.

ITEMS.	RESPONSES					
	Almost never true of me. I hardly ever feel this way	Not often true of me. I feel this way less than half the time.	Sometimes true of me. I feel this way about half the time.	Usually true of me. I feel this way more than half the time	Almost always true of me. there are very few times when I don't feel this way.
1. I'm looking forward to learning as long as I'm living	1	2	3	4	5
2 I know what I want to learn.	1	2	3	4	5
3 When I see something that I don't understand, I stay away from it	1	2	3	4	5
4 If there is something I want to learn, I can figure out a way to learn it	1	2	3	4	5
5. I love to learn	1	2	3	4	5
6 It takes me a while to get started on new projects	1	2	3	4	5
7. In a classroom, I expect the teacher to tell all class members exactly what to do at all times.	1	2	3	4	5
8. I believe that thinking about who you are, where you are, and where you are going should be a major part of every person's education.	1	2	3	4	5
9. I don't work very well on my own.	1	2	3	4	5

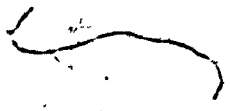
	Almost never true of me: I hardly ever feel this way.	Not often true of me: I feel this way less than half the time.	Sometimes true of me: I feel this way about half the time.	Usually true of me: I feel this way more than half the time.	Almost always true of me: there are very few times when I don't feel this way
10. If I discover a need for information that I don't have, I know where to go to get it	1	2	3	4	5
11. I can learn things on my own better than most people	1	2	3	4	5
12 Even if I have a great idea, I can't seem to develop a plan for making it work	1	2	3	4	5
13 In a learning experience, I prefer to take part in deciding what will be learned and how	1	2	3	4	5
14. Difficult study doesn't bother me if I'm interested in something	1	2	3	4	5
15 No one but me is truly responsible for what I learn	1	2	3	4	5
16 I can tell whether I'm learning something well or not	1	2	3	4	5
17. There are so many things I want to learn that I wish that there were more hours in a day	1	2	3	4	5
18 If there is something I have decided to learn, I can find time for it, no matter how busy I am	1	2	3	4	5
19 Understanding what I read is a problem for me	1	2	3	4	5
20. If I don't learn, it's not my fault	1	2	3	4	5
21. I know when I need to learn more about something.	1	2	3	4	5
22. If I can understand something well enough to get a good grade on a test, it doesn't bother me if I still have questions about it.	1	2	3	4	5
23. I think libraries are boring places.	1	2	3	4	5
24 The people I admire most are always learning new things	1	2	3	4	5

		Almost never true of me: I hardly ever feel this way.	Not often true of me; I feel this way less than half the time.	Sometimes true of me; I feel this way about half the time.	Usually true of me. I feel this way more than half the time.	Almost always true of me: there are very few times when I don't feel this way.
25	I can think of many different ways to learn about a new topic	1	2	3	4	5
26	I try to relate what I am learning to my long-term goals	1	2	3	4	5
27	I am capable of learning for myself almost anything I might need to know.	1	2	3	4	5
28	I really enjoy tracking down the answer to a question	1	2	3	4	5
29	I don't like dealing with questions where there is not one right answer	1	2	3	4	5
30	I have a lot of curiosity about things	1	2	3	4	5
31	I'll be glad when I'm finished learning	1	2	3	4	5
32	I'm not as interested in learning as some other people seem to be	1	2	3	4	5
33	I don't have any problem with basic study skills	1	2	3	4	5
34	I like to try new things, even if I'm not sure how they will turn out	1	2	3	4	5
35	I don't like it when people who really know what they're doing point out mistakes that I am making	1	2	3	4	5
36.	I'm good at thinking of unusual ways to do things.	1	2	3	4	5
37.	I like to think about the future	1	2	3	4	5
38.	I'm better than most people are at trying to find out the things I need to know	1	2	3	4	5
39.	I think of problems as challenges, not stopsigns.	1	2	3	4	5
40	I can make myself do what I think I should	1	2	3	4	5

		Almost never true of me: I hardly ever feel this way.	Not often true of me: I feel this way less than half the time.	Sometimes true of me: I feel this way about half the time.	Usually true of me: I feel this way more than half the time.	Almost always true of me: there are very few times when I don't feel this way.
41	I'm happy with the way I investigate problems	1	2	3	4	5
42	I become a leader in group learning situations	1	2	3	4	5
43	I enjoy discussing ideas	1	2	3	4	5
44	I don't like challenging learning situations	1	2	3	4	5
45	I have a strong desire to learn new things	1	2	3	4	5
46	The more I learn, the more exciting the world becomes	1	2	3	4	5
47	Learning is fun	1	2	3	4	5
48	It's better to stick with the learning methods that we know will work instead of always trying new ones.	1	2	3	4	5
49	I want to learn more so that I can keep growing as a person	1	2	3	4	5
50	I am responsible for my learning — no one else is	1	2	3	4	5
51.	Learning how to learn is important to me.	1	2	3	4	5
52.	I will never be too old to learn new things	1	2	3	4	5
53	Constant learning is a bore	1	2	3	4	5
54.	Learning is a tool for life	1	2	3	4	5
55.	I learn several new things on my own each year.	1	2	3	4	5
56.	Learning doesn't make any difference in my life.	1	2	3	4	5
57.	I am an effective learner in the classroom and on my own.	1	2	3	4	5
58.	Learners are leaders	1	2	3	4	5

Appendix B

Group Embedded Figures Test



GROUP EMBEDDED FIGURES TEST

By Philip K. Oltman, Evelyn Raskin, & Herman A. Witkin

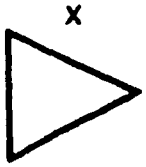
Name _____ Sex _____

Today's date _____ Birth date _____

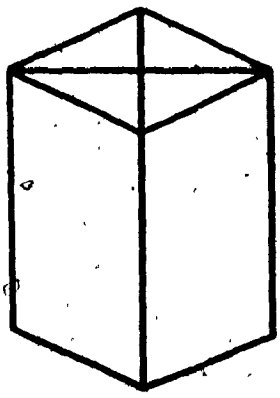
INSTRUCTIONS: This is a test of your ability to find a simple form when it is hidden within a complex pattern.

Here is a simple form which we have labeled "X":

X



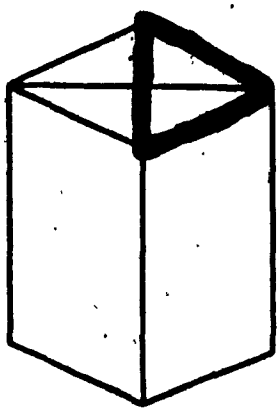
This simple form, named "X", is hidden within the more complex figure below:



Try to find the simple form in the complex figure and trace it *in pencil* directly over the lines of the complex figure. It is the SAME SIZE, in the SAME PROPORTIONS, and FACES IN THE SAME DIRECTION within the complex figure as when it appeared alone.

When you finish, turn the page to check your solution.

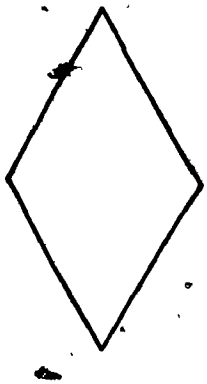
This is the correct solution, with the simple form traced over the lines of the complex figure:

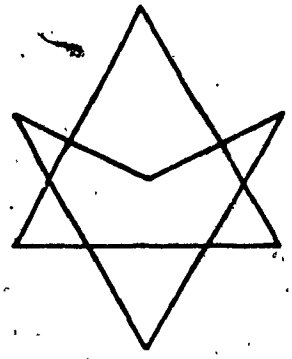


Note that the top right-hand triangle is the correct one; the top left-hand triangle is similar, but faces in the opposite direction and is therefore *not* correct.

Now try another practice problem. Find and trace the simple form named "Y" in the complex figure below it:

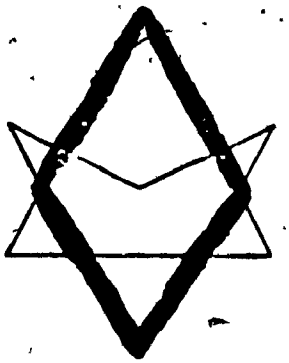
Y





Look at the next page to check your solution.

Solution:



In the following pages, problems like the ones above will appear. On each page you will see a complex figure, and under it will be a letter corresponding to the simple form which is hidden in it. For each problem, look at the BACK COVER of this booklet to see which simple form to find. Then try to trace it in pencil over the lines of the complex figure. Note these points:

1. Look back at the simple forms as often as necessary.

2. ERASE ALL MISTAKES.

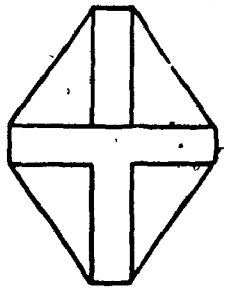
3. Do the problems in order. Don't skip a problem unless you are absolutely "stuck" on it.

4. Trace ONLY ONE SIMPLE FORM IN EACH PROBLEM. You may see more than one, but just trace *one* of them.

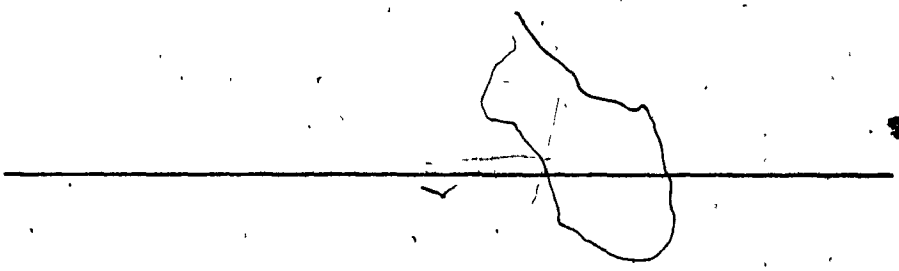
5. The simple form is always present in the complex figure in the SAME SIZE, the SAME PROPORTIONS, and FACING IN THE SAME DIRECTION as it appears on the back cover of this booklet.

Do not turn the page until the signal is given

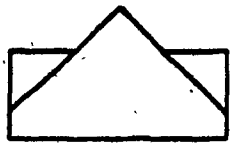
FIRST SECTION



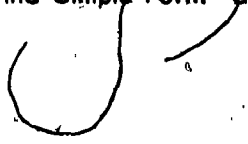
Find Simple Form "B"



2

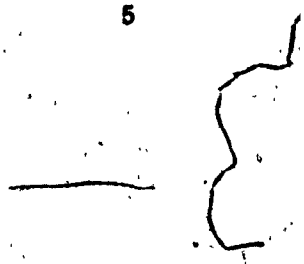


Find Simple Form "G"

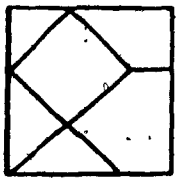


Go on to the next page

5

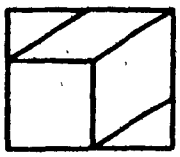


3



Find Simple Form "D"

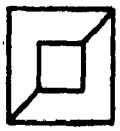
4



Find Simple Form "E"

Go on to the next page

5



Find Simple Form "C"

6

Find Simple Form "F"

Go on to the next page

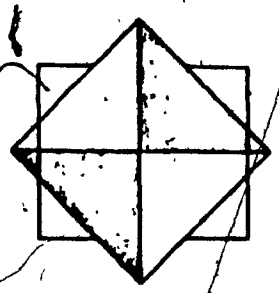
7

Find Simple Form "A"

PLEASE STOP. *Wait for further instructions.*

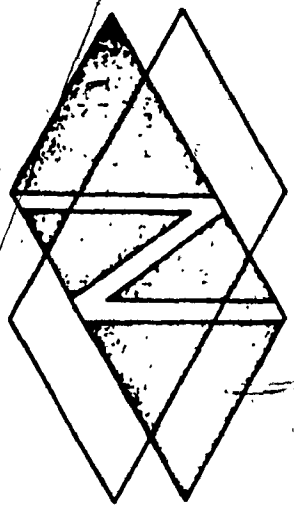
SECOND SECTION

1



Find Simple Form "G"

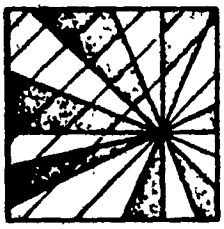
2



Find Simple Form "A"

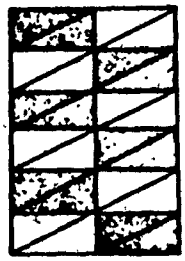
Go on to the next page

3



Find Simple Form "G"

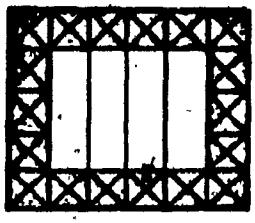
4



Find Simple Form "E"

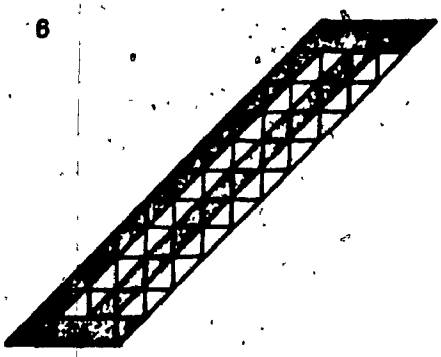
Go on to the next page

5



Find Simple Form "B"

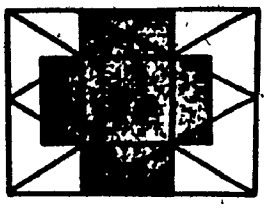
6



Find Simple Form "C"

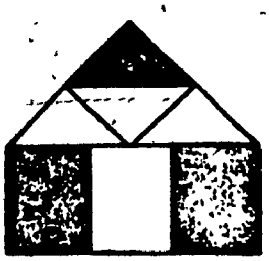
Go on to the next page

7



Find Simple Form "E"

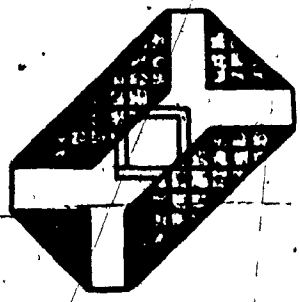
8



Find Simple Form "D"

Go on to the next page

9



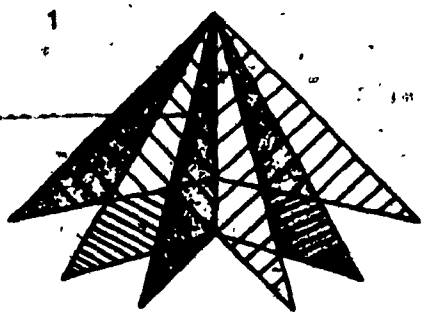
Find Simple Form "H"

PLEASE STOP. *Wait for further instructions.*

21

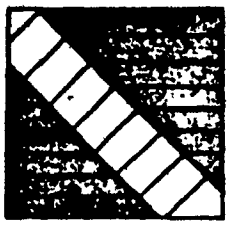
THIRD SECTION

1



Find Simple Form "F"

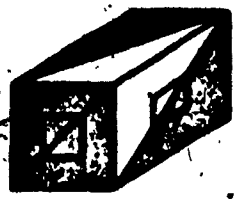
2



Find Simple Form "G"

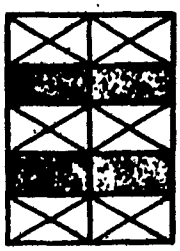
Go on to the next page

3



Find Simple Form "C"

4

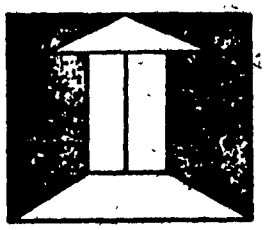


Find Simple Form "E"

Go on to the next page

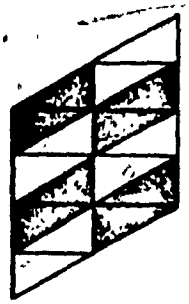
25

5



Find Simple Form "B"

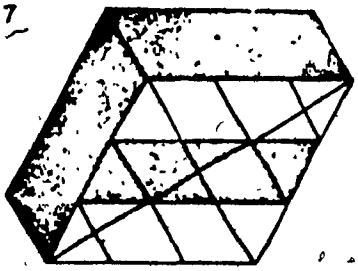
6



Find Simple Form "E"

Go on to the next page

7



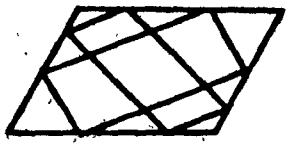
Find Simple Form "A"

8

Find Simple Form "C"

Go on to the next page

9

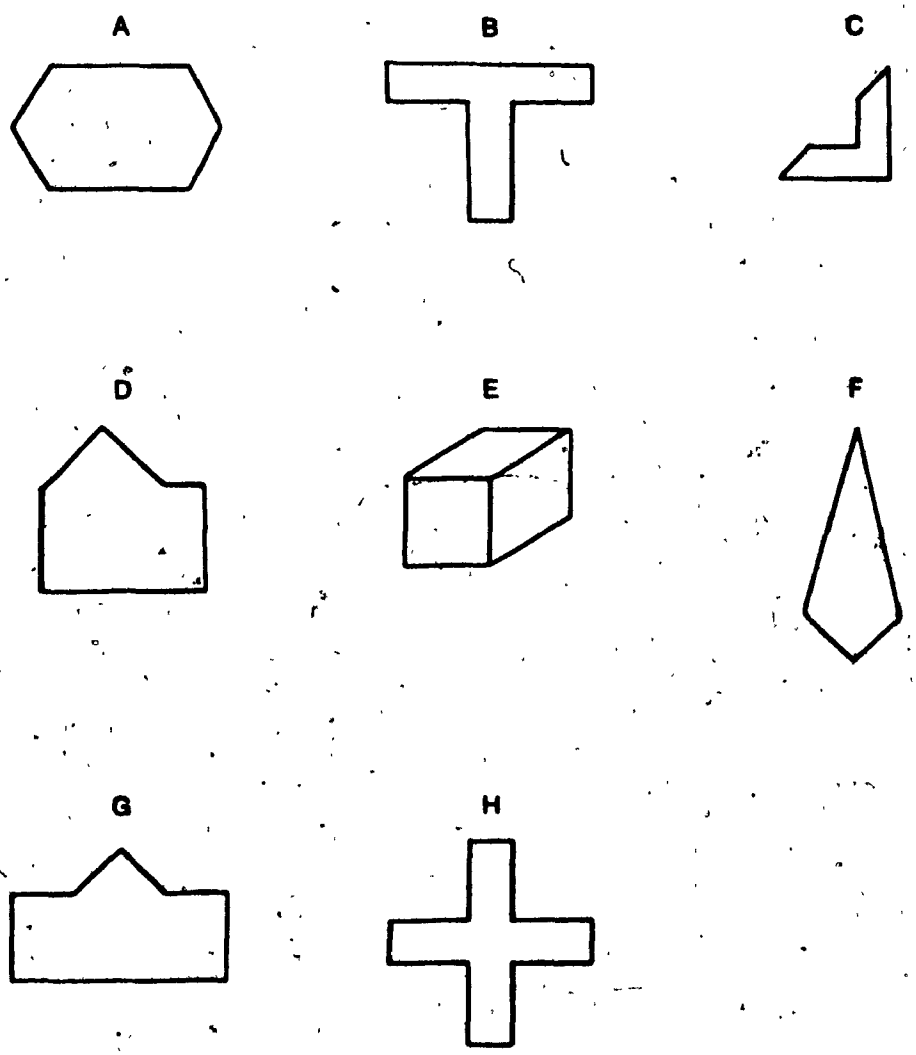


Find Simple Form "A"

PLEASE STOP. *Wait for further instructions.*

31

SIMPLE FORMS



CONSULTING PSYCHOLOGISTS PRESS
577 College Avenue, Palo Alto, California 94306

Appendix C

Personal Background Information Form

PERSONAL BACKGROUND INFORMATION

PERSONAL DATA

Assigned Number: _____

Date: _____ Course No./Title: _____

Date of Birth: _____

Sex: M ____ F ____

First Language: English _____ French _____ Other _____

PREVIOUS EDUCATION

Total Years of Schooling: _____

Date of Graduation from High School: _____

Date of Graduation from CEGEP (if applicable): _____

Major area of study in CEGEP (if applicable): _____

Date of Graduation from University (if applicable): _____

Major area of study in University (if applicable): _____
Degrees _____

PRESENT EDUCATION INVOLVEMENT

Year in CEGEP: 1 ____ 2 ____ 2+ ____

Year in University Undergraduate: 1 ____ 2 ____ 3 ____ 4 ____ 4+ ____

Graduate Med/MA/MSC: 1 ____ 2 ____ 2+ ____

Ph.D.: 1 ____ 2 ____ 2+ ____ 3 ____ 3+ ____

Major Subject: _____

Student Status: Full-time _____ Part-time _____

Appendix D

Consent Form

CONSENT FORM

A) I agree to participate in the research about adult learning.

B) During this investigation I will fill the following forms:

1. Personal background information.
2. Self directed learning readiness scale
3. Group embedded figures test.

C) I understand that I am not required to provide my name or any other detail such as student ID number or social insurance number on any of these forms.

D) I understand that I may be allowed access to the results of this investigation at any given time.

Date: _____ Signature: _____

Appendix E

Letter of Request to Professors

CONCORDIA UNIVERSITY

Adult Education

Date: _____

Professor: _____
Department: _____
Course: _____
Institution: _____

Dear Professor _____

Developing individuals who are capable of increasing or adapting their knowledge and skills in a self-directed manner has been recognized by many as a major educational goal. In a rapidly changing world, self-direction in learning enables a person to adapt to new life circumstances and value systems, to update knowledge and skills, to prevent occupational obsolescence, to avoid dependence on the knowledge, values, and goals of others, and promote progress through inquiry. However, educational researchers and adult education practicitoners are still asking how they can help adult learners in becoming more self-directed.

As a masters student in the Educational Studies program at Concordia University, I have undertaken the study of self-directedness in learning among adults as a major focus of my thesis. Under the guidance of Dr. J. Bhatnagar, I wish to add to the body of knowledge about adult learning. In the future, this information may be elaborated into guidelines which may be of help to those educators working with adult learners in various settings.

This letter represents my personal and professional request for assistance in conducting this thesis investigation. All I ask for is the allocation of approximately 40 to 50 minutes of your class time during the winter term of this academic year. by allowing your students to fill questionnaires about personal perceptions, attitudes, values and abilities, I hope to be able to gather necessary information about aspects of adult behavior that have not been addressed by research.

I am not looking for any information that discloses the identity of your student or you. All I wish is that your students fill the following questionnaires.

LOYOLA CAMPUS
7141 SHERBROOKE STREET WEST
MONTREAL, QUEBEC H4B 1R6

- Background information
- Self-Directed Learning Readiness Scale
- Group Embedded Figures Test

I intend to gather this information during the month of February or early in March, 1985. However, I am flexible and can adapt to your schedule. As a modest contribution to this endeavour, I will be looking forward to sharing my knowledge or providing the results of this investigation to you and/or your students.

Being a teacher myself, I know how difficult it is to devote important class time to goals that are not within the curriculum. However, research endeavours are always complex and only if teachers and students are willing to cooperate will we be able to make progress.

I look forward to hearing from you. Please fill in the attached form and forward it to the return address supplied. I thank you for your cooperation and I will be in contact with you soon.

Sincerely,

Revital Tzuk,
Researcher.

RT:nd
attach.

Name: _____

Department: _____

University/Institution: _____

Course: _____

Date: _____

I am interested in assisting your research endeavours about Adult self-directedness and cognitive styles.

1. I will be able to allocate 40/50 minutes class time. _____ Y/N

   Course Title: _____

   Location: _____

   Date: _____ Time: _____

   Number of students: _____

2. Please contact me for verification details. _____ Y/N
   Telephone: _____

3. I wish to learn more about your research before I agree. _____ Y/N

4. Comments:

   _____

   _____

   _____

   _____

Signature: _____

Date: _____

Telephone Number: _____

Return to: Ms. Revital Tzuk
Department of Adult Education/HB 102
Concordia University, Loyola Campus
7141 Sherbrook Street West
Montreal, Quebec H4B 1R6
Telephone (messages): 482-0320 ext: 402

Appendix F

Data Related to Readiness to Self-Directed Learning by Course Subject, Educational Level, Age and Sex.

Table F-1

Four-Way analysis of Variance: Readiness to Self-Directed Learning by Course Subject, Educational Level, Age and Sex

Source	Sum of Square	DF	Mean Square	F
Main effects	2459.56	8	307.44	.41
Course subject	.01	1	.01	.00
Educational level	188.03	3	62.68	.08
Age	775.03	3	258.34	.34
Sex	1058.57	1	1058.57	1.40
2-way interactions	31854.57	21	1516.88	2.00*
Course subject by educational level	5616.49	3	1872.16	2.47
Course subject by age	3266.85	3	1088.95	1.44
Course subject by sex	18.67	1	18.67	.02
Educational level by age	8801.91	8	1100.24	1.45
Educational level by sex	554.45	3	184.82	.24
Age by sex	4001.16	3	1333.72	1.76
3-way interactions	2895.69	10	289.57	.38
Course subject by educational level by age	1235.99	3	412.00	.54
Course subject by educational level by sex	120.33	2	60.16	.08
Course subject by age by sex	629.73	3	209.91	.28
Course level by age by sex	8.31	2	4.15	.00
Explained	37209.81	39	954.10	1.258
Residual	81884.20	108	758.19	
Total	119094.02	147	810.16	

** p < .01
* p < .05

Appendix G

Data Related to Readiness to Self-Directed Learning by Course Subject, Age, Sex and Schooling Years.

Table G-1

Four-Way analysis of Variance: Readiness to Self-Directed Learning by Course Subject, Age, Sex and Schooling Years

Source	Sum of Square	DF	Mean Square	F
Main effects	6737.69	9	748.63	1.02
Course subject	90.78	1	90.78	.12
Age	1308.91	3	436.30	.59
Sex	874.20	1	874.30	1.19
Schooling years	4463.70	4	1115.92	1.52
2-way interactions	27983.11	26	1076.27	1.47
Course subject by age	2916.55	3	972.18	1.32
Course subject by sex	201.08	1	201.08	.27
Course subject by schooling years	1553.40	4	388.34	.53
Age by sex	4329.98	3	1443.32	1.97
Age by schooling years	623.12	11	704.22	96
Sex by schooling years	1406.37	4	240.11	.33
3-way interactions	16060.18	13	1235.40	1.68
Course subject by age by sex	520.50	2	260.25	.35
Course subject by schooling years	5236.15	4	1309.03	1.78
Course subject by sex by schooling years	623.14	3	207.71	.28
Age by sex by schooling years	1406.36	4	351.60	.48
Explained	50780.97	48	1057.94	1.44
Residual	66041.80	90	733.80	
Total	116822.78	138	846.54	

** p < .01
* p < .05

Appendix H

Data Related to Field-Dependence-Independence by Course Subject, Educational Level, Age and Sex.

Table H-1

Four-Way analysis of Variance: Field-Dependence-Independence by Course Subject, Educational Level, Age and Sex

Source	Sum of Square	DF	Mean Square	F
Main effects	843.58	9	93.73	3.59**
Course subject	452.45	1	452.45	17.33**
Educational level	247.26	3	82.42	3.16*
Age	122.59	4	30.65	.81
Sex	21.287	1	21.28	
2-way interactions	695.51	21	33.12	1.27
Course subject by educational level	148.33	3	49.44	1.98
Course subject by age	152.55	3	50.85	1.95
Course subject by sex	30.26	1	30.26	1.16
Educational level by age	138.36	8	17.30	.66
Educational level by sex	140.65	3	34.88	1.34
Age by sex	114.53	3	38.18	1.46
3-way interactions	130.31	11	11.85	.45
Course subject by educational level by age	37.59	3	12.53	.48
Course subject by educational level by sex	6.40	2	3.20	.12
Course subject by age by sex	65.13	3	21.71	.83
Course level by age by sex	53.81	3	17.94	.69
Explained	1669.40	41	40.72	1.56*
Residual	3106.20	119	26.10	
Total	4775.60	160	29.85	

** $p < .01$
* $p < .05$

Appendix J

Field-Dependence-Independence by Course Subject, Age, Sex and Schooling Years.

Table J-1

Four-Way analysis of Variance: Field-Dependence-Independence by Course Subject, Age, Sex and Schooling Years

Source	Sum of Square	DF	Mean Square	F
Main effects	677.18	9	75.24	3.33**
Course subject	351.58	1	351.58	15.55**
Age	66.47	3	22.16	.98
Schooling years	237.72	4	59.43	2.62
Sex	21.41	1	21.40	.95
2-way interactions	834.84	26	32.11	1.42
Course subject by age	145.86	3	48.62	2.15
Course subject by sex	33.06	1	33.06	1.46
Course subject by schooling years	78.67	4	19.67	.87
Age by schooling years	383.86	11	34.88	1.54
Age by sex	122.60	3	40.87	1.81
School years by sex	183.31	4	45.83	2.03
3-way interactions	652.75	15	43.52	1.92*
Course subject by age by schooling years	254.18	5	50.84	2.25
Course subject by age by sex	69.80	1	69.80	3.09
Course subject by schooling years by sex	172.31	4	43.08	1.91
Age by school years by sex	80.36	5	16.07	.71
Explained	2164.78	50	43.30	1.91**
Residual	2238.00	99	22.61	
Total	4402.78	149	29.55	

** p < .01
* p < .05

Appendix K

Data Related to Readiness to Self-Directed Learning Among Subjects Whose Mother Tongue is English

Table K-1

Descriptive Statistics for Readiness to Self-Directed Learning by Educational Level: Subjects Whose Mother Tongue is English

Level	N	Mean	Stand. Dev.	Stand. Error	Min.	Max.
Pre University	36	224.39	24.46	4.08	185.00	283.00
First year undergraduate	17	218.88	27.44	6.66	160.00	254.00
Advanced & last year undergraduate	17	220.65	26.36	6.40	174.00	261.00
Graduate	25	232.32	27.95	5.60	142.00	287.00
Total	95	224.82			142.00	287.00

Table K-2

One-Way Analysis of Variance for Readiness to Self-Directed Learning by Educationl: Subjects Whose Mother Tongue is English

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	3	2308.31	769.44	1.11
Within groups	91	62849.64	690.65	
Total	94	65157.96		

** p < .01
* p < .05

Table K-3

Descriptive Statistics for Readiness to Self-Directed Learning by Number of Schooling Years Completed: Subjects Whose Mother Tongue is English.

Schooling Years	N	Mean	Stand. Dev.	Stand. Error	Min.	Max.
11-12	21	216.71	18.45	4.03	188.00	260.00
13-14	19	230.42	24.59	5.64	160.00	265.00
15-16	17	224.23	27.70	6.72	185.00	283.00
17-18	24	226.62	35.06	7.16	142.00	287.00
19 and over	8	229.50	14.73	5.21	211.00	257.00
Total	89	224.90			142.00	287.00

Table K-4

One-Way Analysis of Variance for Readiness to Self-Directed Learning by Number of Schooling Years Completed: Subjects Whose Mother Tongue is English.

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	4	2234.49	558.62	.78
Within groups	84	59753.60	711.35	
Total	88	61988.09		

** p < .01
* p < .05

Table K-5

Descriptive Statistics for Readiness to Self-Directed Learning by Subject Matter: Subjects Whose Mother Tongue is English.

Subject	N	Mean	Stand. Dev.	Stand. Error	Min.	Max.
Education & the helping professions	52	224.02	26.56	3.68	160	287.00
Mathematics	43	225.79	26.33	4.01	142	283.00
Total	95	224.82			142	287.00

Table K-6

One-Way Analysis of Variance for Readiness to Self-Directed Learning by Subject Matter: Subjects Whose Mother Tongue is English.

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	1	73.86	73.86	.11**
Within groups	93	65084.10	699.83	
Total	94	65157.96		

** p < .01
* p < .05

Table K-7

Descriptive Statistics for Readiness to Self-Directed Learning by Sex: Subjects Whose Mother Tongue is English.

Sex	N	Mean	Stand. Dev.	Stand. Error.	Min.	Max.
Males	38	225.47	26.62	4.32	142.00	265.00
Females	57	224.39	26.36	3.49	160.00	287.00
Total	95	224.82			142.00	287.00

Table K-8

One-Way Analysis of Variance for Readiness to Self-Directed Learning by Sex: Subjects Whoses Mother Tongue is English.

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	1	26.97	26.97	.03
Within groups	93	65130.98	700.33	
Total	94	65157.95		

** p < .01
* p < .05

Table K-9

Descriptive Statistics for Readiness to Self-Directed Learning by Age: Subjects Whose Mother Tongue is English.

Age	N	Mean	Standard Dev.	Standard Error	Min.	Max.
16-25	45	222.90	24.31	2.62	160.00	265.00
26 and over	42	227.33	27.22	4.20	142.00	283.00
Total	87	224.62			142.00	283.00

Table K-10

One-Way Analysis of Variance for Readiness to Self-Directed Learning for Readiness to Self-Directed Learning: Subjects Whose Mother Tongue is English.

Source	D.F	Sum Squares	Mean Squares	F Ratio
Between groups	1	597.50	597.50	.90
Within groups	85	56364.98	663.12	
Total	86	56962.48		

** p < .01
* p < .05