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**The Development of Potential
in High-Achieving Women
by**

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ABSTRACT

The purpose of this study was to explore the relationship between work/non-work related values, diversity of life-role choices, and life satisfaction in high-achieving women in order to increase understanding of the concept realization of potential congruent with a female perspective.

Pursued within a larger research framework, this study sample consisted of two different age groups of 44 high-achieving women participants and their non-participant cohorts of the Sha'd Valley program.

Statistical procedures included both quantitative and qualitative analyses. Quantitative results indicated significant group differences on five work/non-work values and on six life-roles. Qualitative results indicated perceived achievements to occur within personal and interpersonal lifespaces for younger and older women, parents to be the most important social influence for younger and older women, and life satisfaction to be higher for the younger versus the older group of women.

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This thesis is dedicated to
the memory of my grandmothers,
Julia and Clara

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High mental powers in women will be but an exceptional accident, until every career is open to them, and until they, as well as men, are educated for themselves and for the world - not one sex or the other.

Harriet Taylor Mill (1983). Enfranchisement of Women (p.31).

CHAPTER I

INTRODUCTION

One of the most dramatic trends in contemporary society has been the growing involvement of women in the workplace. Currently, women make up almost fifty percent of the labour force in Canada (Ghalam, 1993). More women today are not only working outside of the home but they are working in almost every field of employment. However, while the extent of women's labour force participation is approaching that of men, the nature of that participation continues to differ greatly from that of men. Gifted women, and women in general, are conspicuously absent from the ranks of many high-prestige, high-salary occupational fields - particularly those associated with physical science, engineering, and applied mathematics - and over-represented in many low-status, low-paying occupational fields such as secretarial work, nursing, and teaching. For example, in 1994, 70 percent of all employed Canadian women were working in either teaching, nursing and related health occupations, clerical positions, or sales and service occupations (Statistics Canada, 1995). This percentage of employed women compared with just 31 percent of employed men who were working in these occupational fields. On the other hand, Canadian women represented only 19 percent among professionals employed in mathematics, engineering, and the natural sciences (Statistics Canada, 1995). Even within the same occupation or occupational field, highly capable women tend to be concentrated at lower economic levels while men predominate at the upper levels (Young & Ansara, 1998). Studies conducted with gifted individuals by researchers in the United States further parallel and substantiate the significant difference between the degrees of participation of

high-potential men and women in mathematic/scientific professions (Reis, 1987; Reis & Callahan, 1989; Silverman, 1986).

Further related to women/gifted women's concentration in traditionally female and frequently lower-level occupations is the finding that, in contrast to men in general, women/gifted women's intellectual capacities and talents are not reflected in their educational and occupational achievements; women/gifted women's career aspirations and choices are frequently far lower in level than are the aspirations of males with comparable levels of ability (Reis, 1987). The educational and occupational achievements of women in general, and of gifted women in particular, suggests substantial unrealized potential.

Many studies have been conducted to determine why so many highly able women fail to achieve their full potential. To explain this phenomenon, the research and literature suggests a number of different factors ranging from traditional definitions of career achievement being too narrow and stereotypically masculine (Eccles, 1987), to the negative impact of external and internal barriers (Helson & Picano, 1990; Holland & Eisenhart, 1990; Kerr, 1994; Noble, 1989; Reis & Callahan, 1989; Sadker & Sadker, 1994). While these factors are important for understanding the degree to which gifted women have or have not realized their potential, they have, for the most part, failed to provide adequate explanatory power for understanding the career and/or life choices of gifted women (Fleming & Hollinger, 1994).

The present research utilizes a theoretical model that has been developed and validated to investigate the impact of psychological and social factors upon achievement-related decisions and related consequences in the mathematics/sciences area (Eccles, 1987; Eccles & Harold, 1992; Eccles, Jozefowicz, Barber & Belansky, 1993).

CHAPTER II

NATURE OF THE PROBLEM

Rationale

The past several decades have witnessed unprecedented changes and opportunities in the lives of women and girls. More than ever before, women are working outside the home, moving into domains traditionally reserved for men, and vigorously pursuing careers and interests (Arnold, Noble & Subotnik, 1996). Coupled with higher levels of involvement in the workplace, the development of employment equity policies, higher educational attainment, later marriages, and fewer children, women have enjoyed considerable progress since the 1980s, in their social, economic, and political status (The United Nations, 1991). Despite such progress, however, high achieving women, and women in general, continue to experience disparities in numerous facets of their lives. Current statistics indicate that women are underrepresented in male dominated fields at the university level (Normand, 1995) and in high wage earning positions in the workplace (Ghalam, 1993; Jordan, 1992, cited in Lips, 1993; Spalter-Roth & Hartmann, 1990). The publication Women in the Workplace (Ghalam, 1993) reports that Canadian women earn, on average, 72 percent or less than their male counterparts and are poorly represented in positions of legislative power and decision making. In addition, they are disadvantaged economically as a result of inadequate child care facilities, penalties in replacement income for maternity leave, and inequities in pensions.

These disparities have devastating consequences from both social-structural (macro) and individual (micro) perspectives. On a macro level is an anticipated severe shortage of personnel before the end of this century, most notably in the sciences and science-related professions (Sherriff & Svenne,

1993). According to Sherriff & Svenne (1993), the reasons for this anticipated shortage in science-related areas are a combination of increasing demand for scientists to develop new technologies and to seek solutions to environmental problems, and because the current scientifically and technologically trained work force is aging and will soon be leaving in increasing numbers. At the same time, the anticipated supply of scientists from the traditional sources, immigration and male university graduates, is declining. Immigration cannot be expected to supply the demand as other countries, Europe, Japan, and the United States, face the same shortages (Sherriff & Svenne, 1993). Canadian attendance rates by males at university are already nearly the highest in the world and are unlikely to increase significantly (Normand, 1995). Women are an under-utilized human resource that could help meet the technological need in the coming years.

Moreover, the welfare of humankind is also considered to be at risk as a result of the continued exclusion of women from the power structures of society. Qualities of care, connectedness, and nurturance, more typically attributed to females, are "as important for carrying on society's economic, political, and social processes as its reproductive ones," particularly if we are to avoid such perils as nuclear holocaust and the depletion of the earth's natural resources (Martin, 1985, p. 77). Women have the potential to humanize power structures, thereby significantly influencing the welfare of humankind (Scherr, 1986). Focusing on the value of connectedness and the importance of a relational world view is a critical concern for the future personal and social wellbeing of men as well as women.

On a micro level, the lesser value attributed to work inside the home and to traditional female occupations leaves women vulnerable to feelings of worthlessness, frustration, and despair (Carmen, Russo, & Miller, 1984).

Because women are effectively shut out from important roles of decision making which determine social policy and structure, they are more vulnerable to alienation, poverty, and mental illness (Armstrong & Armstrong, 1981). With limited access to positions of power, wealth, and prestige, women remain prevented from actualizing their full potential in personal, social, economic and political realms of their life. Such failure to realize potential effectively represents an individual loss in terms of general level of satisfaction with one's own life (White, 1984). The waste of female talent and ability is a significant personal and societal problem that needs to be counteracted.

Significance of the Problem

There are compelling reasons for studying the realization of potential in gifted and talented women relative to their personal values and salience of various life-roles. First, despite their early indications of promise, gifted girls fail to become eminent women (Subotnik, Kassar, Summers, & Wasser, 1993). It is inherently logical and consistent with models of career choice that individuals possessing higher levels of ability should also achieve higher educational and occupational levels. However, numerous studies indicate that although there are equal numbers of male and female children identified as gifted in elementary school, there are fewer girls than boys identified for gifted programs in junior and senior high school (Fox & Turner, 1981). Comparatively fewer women go on to college (Jensen & Hovey, 1982) or complete graduate training even in such traditionally over-represented female fields as education (Eccles & Hoffman, 1984). Discussing findings from the 10-year longitudinal study of Illinois high school valedictorians, Arnold (1993) observed

The realization of early promise is far more difficult and complex for academically talented women, as well as for minority students, than for male valedictorians. . . Attrition of academically gifted women from high-level achievement

settings and their lowering of intellectual self-esteem begins as early as the sophomore year in college and continues through college, graduate school, and even post-doctoral work (pp. 393-394).

Research consistently documents that despite their outstanding ability early in life, the achievements of gifted women in adulthood clearly contradict their early intellectual promise (Kerr, 1985, 1994; Terman & Oden, 1959). It appears that the majority of women will settle for far less than their full potential, while most of their male peers go on to positions of leadership in education, science, industry, the arts, and other sectors of society (Kerr, 1994).

Another reason linked to the disproportionate representation of achievement and/or success between gifted females and males may lie in the definition of career achievement that is presented in many existing traditional career theories. Traditionally, career achievement has been formulated by researching men's career development, utilizing college-educated, middle-class, white men. Importantly, this was based on a belief that men had careers; women had temporary employment or jobs that took second place to family interests and obligations. Conveniently, employers offered women jobs that were easy to enter and that required relatively little training and afforded little potential for advancement (Gutek & Larwood, 1987). Thus, there was little reason to study the career development of women. It was easily summarized: there was none (Gutek & Larwood, 1987).

Within traditional theories of career development paid work has been seen as the only arena for career achievement (Hashizume & Crozier, 1994). This definition has influenced how women's patterns of career development and their choices regarding achievement have been viewed. Women are often studied to see how they depart from the male standard, both in choice of a career and in career development. However, because women's career

development is more complex than men's career development (Ginzberg, 1966; Diamond, 1987), some have argued against this comparison standard.

Gilligan (1979), for example, has argued that theories of career development, by taking for their model the lives of men, have failed to account for the experience of women. "Implicitly adopting the male life as the norm, psychological theorists have tried to fashion women out of a masculine cloth" (p. 432). Women's place in man's life cycle, Gilligan stated further, "has been that of nurturer, caretaker, and helpmate, the weaver of those networks of relationships on which she in turn relies" (p. 440).

Jean Baker Miller (1986) writes that there is a danger today, insofar as "some people advocate another form of the 'right thing' [for women], as in 'the only right thing to do is to strive unstintingly for a high-powered career'" (p. xii). She notes that the high-powered career, which is currently seen as symbolizing success, may not be grounded in the life experiences and desires of women; yet, in our practice with women, we often continue to apply a male standard of ideal achievement, and fail to entertain the possibility that "not engaging in some activity may reflect the choice of an alternate activity rather than avoidance" (Eccles, 1987, p. 138).

The failure of many women to realize their full potential is an issue of significant concern. As a culture, we acknowledge and reward only those talents and abilities that have direct, marketable value (Noble, 1987), we tend to dismiss gifts that aren't rewarded materially or that aren't technologically oriented, and we discount those that are stereotypically female (i.e., the ability to love, to understand, to empathize). Further, the focus of many traditional career theories has been on career pathways in isolation rather than in relationship to other life arenas (Reis, 1995). We need theories of career development that will take into account not only the school and work spheres, but the other life

spheres because these life spheres have a great impact on, especially women's, career development (Marshall, 1989).

The present study is an attempt to go beyond examination of the existing external and internal barriers that thwart gifted women's realization of potential. The purpose of this study is to explore the role of values in relation to the personal, educational, and career choices made by highly capable mature women. Rather than focusing on the traditional theme of why highly able women do not achieve, the focus of this study is on what gifted women do achieve. Further, this examination incorporates the characteristics and behaviours which are valued by women, and recognizes achievement in a variety of life roles and domains. Most importantly the focus of this study will be on allowing gifted women the opportunity to define success on their own terms, and in their "own voice."

The intent of this study is to utilize the model developed by Eccles (1985) and her colleagues to explore the relationship of values, to diversity of life-role choices, and life satisfaction in two different age groups of mature, highly able women who applied and/or participated in an enrichment program for gifted students in math/science. The importance of subjective task value is stressed, as is the need to study women's achievement-related choices from the perspective of gifted women. Finally, the intent of this study is to examine and clarify the concept "realization of potential," and to broaden current conceptions congruent with both men's and women's worldview.

CHAPTER III

REVIEW OF THE RELEVANT LITERATURE

Why do girls of extraordinary intellectual potential so often fail to become women of accomplishment? There is clearly a link between showing promise as a girl and becoming a highly successful, eminent woman, but the connection is not well understood (Schlosser, 1995). Most of the research on eminent adults pertains only to men, with a few notable exceptions (Hollinger & Fleming, 1992; Kerr, 1994; Leroux, 1994; Noble, 1989b; Northcutt, 1991; Yewchuk & Chatterton, 1990). Previous studies focusing on the development of potential in gifted women have addressed the issue of internal barriers which include: lowered self-esteem (Arnold, 1993; Yewchuk & Chatterton, 1990), lowered academic/career expectations and achievement (Arnold & Denny, 1985; Olshen & Matthews, 1987), and psychological adjustment (Kerr, 1994; Tavis, 1992). Previous studies have also addressed the issue of external barriers which include school, parental, and societal influences on realization of potential in gifted women (Holland & Eisenhardt, 1990; Raymond & Benbow, 1989; Sadker & Sadker, 1985, 1994). Finally, previous research studies have focused on the formal and the informal assessment procedures used in measuring the personal and professional accomplishments of gifted women. Variables have been proposed and investigated singly or in various combinations as the sources contributing to the realization of potential in high-achieving women. In contrast, research focused on the overall development of intellectually gifted women in relation to their educational, personal and career choices is exceedingly rare (Reis, 1991). Very little research has explored factors which facilitate or enhance gifted women's career development and/or achievement.

Much of the women's career development literature reflects acceptance of a male model of career development, achievement and success.

This chapter highlights the relevant theoretical and empirical contributions which have shaped the direction of the current research on women's career achievement. Particular emphasis will be given to traditional, and contemporary theories of career development, external and internal barriers to women's achievement, and factors contributing to women's successful achievement. This literature review is not intended to be exhaustive (Swenson, 1996) as many of the references to the literature will occur during the data collection, analysis and discussion. Additional literature is referred to in the analysis and discussion in an attempt to compare and contrast the data with other known realities, and to classify the data meaningfully (Boyd, 1993).

CAREER DEVELOPMENT THEORIES

This section will review some of the major traditional career theories and their limitations beginning with the work of Parsons. The section will also review some of the more contemporary theories emerging in the area of women's career development.

Traditional Career Development Theories

Parsons

The roots of career development theory emerged in the early 1900s with Parsons (1909) Trait-Factor theory. Parsons believed that if people actively engaged in choosing their vocations rather than allowing chance to operate in the job hunt process, they would be more satisfied with their careers, employer's costs would decrease, and employee's efficiency would increase. Some of the underlying assumptions of this theory are: occupational choice is a

single event in an individual's lifetime; there exists a single "right" choice for each individual; a single type of person works in each job; and there is an occupational choice available to everyone. Hence, free choice in decision making is one of the underlying assumptions of the trait-factor theory. This implies that all individuals have equal access to education, training and occupations. However, studies reviewing women's career choices, with the underlying assumption of free choice, and results finding women have less career motivation, are ignoring the barriers, and limitations that women face in making decisions (Astin, 1985).

Another subtle assumption of this theory is the emphasis on the paid work role as the only means through which to experience success in a career. A major study by Thorndike and Hagen (1959) of the careers of 10,000 men illustrates the typical, traditional definition of career success used. Career success was indicated by the following factors: earned income, self-rated success and satisfaction; vertical and horizontal job mobility (up-the-career-ladder); number of individuals supervised, and length of time on the job. External standards of career success (i.e., stability, security, prestige, power and independence) were used as indicators of achievement, and have been broadly applied to females. Consequently, these external indicators have influenced how women's patterns of career development and their choices regarding achievement have been viewed.

Ginzberg

Ginzberg, Ginsburg, Axelrad, and Herma (1951) set forth a radical psychological-based theory of career development that broke with the static model of trait and factor theory. Ginzberg et. al., posited that career development was a developmental process spanning the period from six to ten years, and ending by young adulthood. While the Ginzberg group recognized

individual variations in the career choice process, "Individual patterns of career development that lack conformity with age-mates were identified as deviant" (Zunker, 1986, p. 20). The assumption of this theory was that a man achieved his status almost exclusively through his work while a woman's success was linked to the significant male in her life, generally her father or husband. It was assumed that men worked and pursued careers while women were not expected to pursue careers. Any deviation from this norm was considered radical. Thus, it follows, some women may be reluctant to become more career oriented for fear of losing the stereotypical female identity so readily accepted by our society (Zunker, 1986).

Critics of the Ginzberg theory include Wortley and Amatea (1982) who noted that attempts to generalize about normative patterns of adult development were based on the premise that, while the nature, duration and timing of an individual's career pattern may vary, certain pathways and tasks were predictable. They commented that although multiple role changes necessitating adaptation are faced by adults as a group, it is an error to say that these stages are fixed and uninfluenced by individual differences. Rather, they posed, it is gender which prescribes behaviour more prominently than age at any given time. Similarly, the work of Perun and Beilby (1981) has demonstrated that the determinants of the occupational behaviour of women are different from those of men, and that the trajectory of the work cycle of women is less predictable than that of men.

Zytowski

In an attempt to better understand women's career patterns, a more heuristically useful model was formulated by Zytowski (1969), who offered nine postulates designed to characterize female patterns of occupational participation. His central proposition was that the model life role for women was

that of homemaker, although he stated that this role was not static. A second major postulate was that vocational and homemaker participation were mutually exclusive and that, consequently, vocational participation constituted departure from the homemaker role. Zytowski further postulated that vocational participation patterns could be characterized by three dimensions: age of entry, span (length in years) of participation, and degree of participation (i.e., the traditional versus the non-traditional occupation for women).

Based on these three dimensions, Zytowski described three resulting patterns: (1) the "mild" vocational pattern, characterized by early or late entry and low degree participation; (2) the "moderate" pattern, characterized by early entry and lengthy span, but low-degree participation; and (3) the "unusual" career pattern, characterized by early entry, lengthy or uninterrupted span, and a high-degree of participation. Zytowski's model attempted to combine a notion similar to that of career orientation (span of participation) with the traditional versus non-traditional distinction (degree of participation). Thus, Zytowski's theory asserts that although most women are homemakers, the frequency and singularity of this role is changing, and that when careful observation of women's life roles are made, they are seen to be orderly and sequential, but not achievement oriented (Osipow, 1983).

Although Zytowski's model was a major contribution to the study of career patterns among women, it is inadequate in terms of many women who enter male-dominated occupations, except for those who enter early and work continuously (Betz & Fitzgerald, 1987). A female scientist and mother, for example, would be unclassifiable, or viewed as being "unusual" in this framework, because of the incompatibility between the worker and homemaker role.

Holland

Holland (1973) provided a model that explains the particular occupational direction that individuals' career aspirations take. Holland's theory is based on the assumption that most people can be categorized into one of six personality types and that there are six corresponding kinds of environments. People are assumed to search for compatible environments that will let them exercise their skills and abilities and express their attitudes and values (Holland, 1973). Holland's six personality types are: Investigative (I), Artistic (A), Social (S), Enterprising (E), Conventional (C), and Realistic (R). Individuals seldom fall exclusively into one of these types, and so a system was devised to indicate primary and secondary types. In essence, Holland hypothesized a *goodness of fit* model of career development wherein individuals match their self-stereotypes with their stereotypes of primary work personalities.

Within Holland's theory, occupations are seen as a way of life, "an environment rather than a set of isolated work functions or skills" (Holland, 1973, p. 4). Vocational satisfaction depends on the congruence between personality and working environment. In Holland's schema, personality tends to be viewed as somewhat static and unchanging. This implies that women are not likely to change insofar as career orientation, interests, and goals are concerned. Moreover, this view is likely to perpetuate the status quo and to support the self-fulfilling prophecies regarding women in the world of work. Holland's theory explains existing phenomena - things as they are today, regardless of underlying sociological processes or causes.

For example, on his Self-Directed Search (SDS), a vocational interest inventory yielding scores on the six dimensions of his theoretical model, men generally get Realistic/Investigative/Enterprising (RIE) codes - the high scores of which are typically associated with traditional male professions - whereas

women obtain Social/Artistic/Conventional (SAC) codes - the high scores of which are associated with traditional female professions. The resulting sex differences in occupational suggestions have brought accusations of sexism (Weinrach, 1984). Socialized patterns of interest lead to interest inventory results which perpetuate females' overrepresentation in traditionally female occupations and their underrepresentation in occupations traditionally dominated by males. Women who have spent most of their time raising children, as opposed to working outside the home, generally have a summary code of Social/Artistic/Enterprising (SAE) (Gutek & Larwood, 1987).

Super

The self-concept plays a central role in Supers' (1957, 1984) theory of career choice and development. Supers' theory, which he defined as implementation of one's self-concept, integrates a number of variables - including biological, psychological, and environmental - that influence the development of the self-concept throughout the individual's life span. According to Super, career patterns of men are applicable to women if modified to take marriage and childbearing into account. He described patterns for women as "stable homemaking, conventional (working followed by marriage), stable working, double-track (working while homemaking), interrupted (working, homemaking, and working, either while homemaking or after having given up homemaking), unstable, and multiple-trial (1984, p. 215-216). Patterns for men, on the other hand, were stable, conventional, and unstable. Similar to Parson's trait-factor theory, Super's model was one of climbing the career ladder, which characterized career achievement as an upward slope. Super hypothesized that there was no difference in the role self-concept played in male and female career development: Both "appear to make decisions on the basis of their self-concept and their concept of the circumstances in which they live" (1984,

p. 216). Accordingly, it was assumed that individuals developed their self-concept through their occupation, and that work was the major sphere for development.

Some authors have criticized Super's proposal, suggesting that self-concept may be perceived differently by men and women. For example, Richardson (1979) argued that, for women, the work role may not be the place where they develop their self-concept; other life roles, such as home and family, may be more salient for women. With respect to subsequent critiques of his earlier model, and work in a national/international area, Super (1990) revised his Self-Concept Theory of Vocational Choice, by embedding the work role within the overall lifestyle of the individual. Within this revised theory, the career is conceptualized as a constellation of interacting and varying life roles, where the importance of life roles waxes and wanes over the individual's lifetime. Super (1990) notes that the empirical study of the configuration of life roles will help to develop a, "clearer picture of the meaning of work, homemaking, leisure, study and community service. . ." (p. 204). Life roles theories, such as Super's revised model, enable career researchers to explore the work role, and other multiple roles in the lifestyles of women.

Summary

A review of the literature on traditional career development theories illustrates the direction career development has taken since the field was defined in Parson's work (1909). Parsons outlined the "matching men and jobs" approach to career decision-making. This emphasis on career choice became a foundation of the field and a central basis for vocational counselling. Since 1909, major theorists such as Holland, Ginzberg, Zytowski, and more recently Super, have elaborated on the nature and process of career choice and

development over the life span. While the field of traditional vocational psychology has had tremendous theoretical and applied utility, its focus has until recently been primarily on the career development of men (Osipow, 1983). Only in the last several years has systematic attention been paid to the unique, and complex career development patterns of women. The next section will briefly review current theories in the area of women's career development.

Contemporary Career Development Theories

As early as 1966, Ginzberg noted the complexity of women's career paths. By the late 1970s and mid-1980s, a number of researchers began the formulation of career development theories to account for the career development of women. By recognizing and incorporating sociopsychological and sociostructural dimensions, researchers such as Astin (1985), Eccles (1985), and Marshall (1989) put forth career development theories which more closely approximated women's life experiences. Common to these contemporary theorists is a recognition that career development, especially with respect to women, can not be viewed in isolation, but rather must be viewed in relation to other life spheres. In reformulating career development theory, contemporary career development theorists have recommended that the dimension of relatedness be taken into account when considering women's careers. Fleming and Hollinger (1993) said:

At present . . . the clearest theoretical "certainty" is that, regardless of commonality either of context or person, the filter of individual perception and interpretation of both context and the self plays a central role in the life decisions made by gifted women. To the extent that gifted women are relational in their orientation, their perceptions, and concomitant incorporation of the expectations of significant others in their personal contexts may at least partially explain the greater complexity of gifted women's career development than is observed among their male counterparts. (p. 16).

From a more global perspective, Belenky, Clinchy, Goldberger, and Tarule (1986), Gilligan (1982; 1988), and Josselson (1987) have recently suggested that women have a different value system from men, a system which influences academic, career, and all other life choices, and ultimately plays a primary role in their educational and occupational achievements.

Belenky et al., (1986), Gilligan (1982), and Josselson (1987) suggest that in order to understand women's lives, one must recognize that in comparison to men, women simply have a completely different world view, one that is relational in nature. According to these theorists, women are different from men in their sense of connection and in their need to be related to others. Men, on the other hand, are more concerned with separation and autonomy. These perspectives influence what each gender will generally consider an appropriate career choice, one that will lead to personal satisfaction and fulfillment. Gilligan (1982) focuses on the *different voice* associated with women and describes standard psychological theories of human development as having been based on observation of men. She believes women were compared to this standard and judged deficient. Gilligan suggests a new look at that voice, one which considers it not deficient, but simply different.

The different voice/world view contemporary researchers claim that women possess may play a primary role in the estimation of their personal potential. If women's perspectives are based on a different set of values, then the career choices that satisfy men may not necessarily be equally satisfying for women, even if they have the potential and aptitude to excel in those careers. Similarly, it may be that careers in mathematics, sciences, politics, economics and law do not "measure up" within the context of female values and interests. Gifted female underrepresentation in such careers, consequently, would spring from an incompatibility with feminine values rather than from inability or

deficiency. Thus, the different voice or world view that women are thought to possess, may be a vital starting point for examining why so many highly able women appear to fail to develop their potential. Indeed, the career development of women may operate from this broader perspective.

With respect to this broader orientation of women's career development, few researchers have attempted to develop a theoretical framework to guide current and future research endeavors which aim to identify the sources of unrealized potential in gifted women. One notable exception, however, is a model developed by Eccles (1985) and her colleagues.

Eccles Achievement-Choice Model

The Achievement-Choice model is a social-cultural framework for understanding how women make occupationally-related choices and decisions. Eccle's model is based on concepts used in decision-making in achievement and in attribution research (Figure 1, Meece, Parsons, Kaczala, Goff, & Futterman, 1983). It links occupational aspirations and achievement-related choices to expectations for success and subjective value within a particular field of work/study. Expectations for success and the subjective value of the task are the central constructs within this model. These constructs are central because they are hypothesized to most directly influence achievement behaviors and to serve as mediators on the influence of other constructs. In particular, expectancies and value are posited to be influenced directly by the individual's goals, perceptions of his or her abilities, and perceptions of the task demands. These constructs are in turn influenced by perceptions of socializer's beliefs and behaviors and perceptions of cultural roles and values.

Within Eccles model, gender-role socialization, anticipated task demands, expectations for success, and subjective task value influence career

choice. Choices are characterized as conscious or unconscious decisions that people make in their daily lives such as what courses to take or how hard to work. These choices are, in turn, directly or indirectly influenced by sex-role stereotyping, attitudes, interests, and self-concept, all of which are the culmination of socializing experiences. The individual's personal values, related to goals and expectations, both immediate and long-range, form the basis for career development and success.

According to Eccles, compared to men, women have different but equally important goals that change over the lifespan. Therefore, Eccle's theoretical viewpoint provides for an exploration of the additive effects of the interrelated contributing variables on achievement-related behavior in gifted females. While structural impediments are acknowledged, the Achievement-Choice model provides a more positive explanation of achievement patterns than do attributions to women's lack of confidence or low expectations. More importantly, this framework provides for a move away from traditional, sex/ gender differences research, to a focus instead on within gender differences, in order to understand the diversity of life choices that women make (Eccles, 1994).

Summary

Facilitating the career development of women, in general, has been quite challenging. Over two decades ago, Ginzberg and colleagues (1966) observed that when compared with the simple, straightforward career patterns of men, women's career and life pathways are quite complex. More recently, a number of researchers have developed separate theories for understanding women's career development. Common to some contemporary researchers focusing on women's career development is the need to consider the context of women's

lives and to recognize the interrelatedness of career decisions and choices related to the realities of other life spheres (Astin, 1985; Marshall, 1989). Other contemporary researchers, such as Gilligan (1982) and Belenky et al. (1986), have suggested that women have a different worldview, and speak in a different voice from that of men. Furthermore, such a worldview (or relational orientation) may influence women's academic, career, and other life choices. A theoretical model developed by Eccles (1985) reflects the current trend to studying women's career development by being much broader in scope, more psychosocial in orientation and phenomenological in nature, than more traditional career development theories.

BARRIERS TO WOMEN'S ACHIEVEMENT

Although there is increasing interest in attracting women to positions of social, political, educational, and scientific leadership, many obstacles inhibit women from realizing their potential in these areas. Women face more constraints (or barriers) when compared with men which are detrimental to their career advancement and achievement. These obstacles (or barriers) to female achievement have been characterized as being external or internal (Kerr, 1994). External barriers include sociocultural conditioning and institutionalized sexism through occupational and educational discrimination. Internal barriers include Fear of Success, the Cinderella Complex, the Imposter Syndrome, and Psychological Adjustment, to name a few. Almost all of these barriers are attributable to how our society perceives the role of women, how (or if) we foster and encourage female achievement, and how we socialize girls and women to perceive themselves and their expected and valued roles in society. This next section will review the external, and internal barriers affecting women's achievement.

External Barriers

An important agenda of the women's movement has been to articulate and make public the sexist and discriminatory practices that exist at all levels of the social community (Worell & Remer, 1993). As a result, revised social practices as well as numerous legal interventions have lessened the extreme effects of societal sexism (Worell & Remer, 1993). However, discrimination against women remains evident in many sectors of society. Gender-based discrimination is deeply institutionalized in our educational, economic, and occupational systems.

Educational Barriers

Ostling (1992) wrote that "there is compelling evidence that girls are not receiving the same quality, or even quantity, of education as their brothers" (p. 49). Gender-based discrimination in our educational systems has been well documented. Evidence from a number of studies shows that teachers, counselors, and administrators respond differently to boys and girls in ways that reflect traditional sex-role stereotyping (Eccles & Blumfield, 1985; Kramer, 1991; Sandler, 1982), and further, that girls are being shortchanged. For example, Sadker and Sadker (1985) observed 100 fourth, fifth and sixth grade classrooms in four American states and the District of Columbia, and found that boys dominated classrooms vocally. In most of these classrooms it was expected that children would raise their hands before speaking up; however, when boys called out answers without raising their hands the teachers usually accepted the answers. This was not the case for the girls. When they called out the teachers told them to raise their hands, ignored their responses and went on to somebody else.

This differential response to boys and girls by teachers gives the message that boys should be academically assertive and grab the teacher's

attention while girls should act "like ladies" and keep quiet (Sadker & Sadker, 1985, p. 56). Sadker and Sadker (1985) concluded that boys are taught more actively and that they get more attention and encouragement from teachers than girls. "The average female is ignored - neither reprimanded nor praised. . .so that girls learn that their opinions are not valued, that their response to questions are not worthy of attention" (Shakeshaft, 1986, p. 499). This conclusion is also consistent with studies that have been conducted at the junior, and senior (Silverman & Holmes, 1992), and post-secondary (Sadker & Sadker, 1994) school levels. It seems that at all levels of education, women can expect to find an atmosphere of differential academic encouragement and equity (Kerr, 1994).

Gender-role discrimination is also reflected in educational textbooks, and instructional materials (Sadker & Sadker, 1994). Educational materials often show women and men in sex-stereotyped activities and occupations, use more male than female pronouns, under-represent female contributions in all fields and, in general, depict males more often than females (Worell & Remer, 1993). In a content analysis of 15 elementary math, language arts, and history textbooks currently used by school districts, Sadker and Sadker (1994) found numerous examples of stereotyping. For example, a 1989 language arts textbook had twice as many boys and men as girls and women depicted. A 1989 history textbook had four times as many males pictured as females. In a sixth-grade history textbook, only 11 female names were mentioned and not a single adult woman was included in the text. When Sadker and Sadker examined a sixth-grade social studies text, only 11 female names were mentioned in a 631-page textbook.

These examples of the dominance of the male voice reinforce the stereotypical beliefs about appropriate roles for females. The recent trend away

from prescribed texts at the elementary level towards whole language approaches is likely to make it even more difficult to correct this gender bias in the selection of literary materials used in the classroom (Yewchuk, 1992). The situation is not any better in high school.

Galloway (1980) found in his study at the high school level, that eight times as many books were authored by males as by females. Furthermore, male main characters in these books outnumbered females by the ratio of seven to one. Two-thirds of the female characters were created by male writers. Only one main character out of a possible 24 was a female character from a women's perspective. Thus, gender bias in textbooks exists at all grade levels from kindergarten through graduate school (Sadker & Sadker, 1986). Although there have been improvements, sexism is still very much present in current educational materials, as well as in teacher attitudes and behaviors.

The impact of teacher attitudes and actions is particularly well-documented with respect to mathematics (Kreinburg, Eccles, & Becker, 1989). Sadker and Sadker (1994) found in their sample of high school students, that males received more attention from the teacher than females, as well as more precise, informative responses; girls were rewarded for sitting quietly. More importantly, while the males were becoming increasingly proficient at problem solving and working independently, the females were becoming increasingly proficient at computational, rule-bound tasks and more dependent on the teacher. Another study in the area of teacher attitudes found that male teachers may be more discouraging toward gifted girls' aspirations than female teachers (Cooley, Chauvin & Karnes, 1984).

Cooley, Chauvin & Karnes (1984) found that both male and female teachers saw gifted boys as more competent than gifted girls in critical- and logical-thinking skills and in creative problem-solving abilities, and they saw

gifted girls as being more competent in creative writing. Further, male teachers viewed female students in a more traditional manner than did female teachers: They perceived gifted girls to be more emotional, high strung, or gullible, and less imaginative, curious, inventive, individualistic and impulsive. These differential teacher responses do not seem to be the result of deliberate discrimination on teachers' parts, rather, differential instruction seem to be both a response to different behaviors of boys and girls and a reflection of underlying socialized attitudes that are mostly unconscious (Kerr, 1991). However, the differential treatment by teachers towards gifted girls may act to inhibit high-potential women from breaking from traditional sex-role socialization, and from aspiring in non-traditional pursuits.

Another barrier to women's achievement is reflected in the administrative hierarchy of our educational institutions (Shakeshaft, 1989). While the majority of elementary teachers are female, the percentage of female administrators and female faculty dramatically decreases as grade level increases. For example, less than 2 percent of public school superintendents in Canada are female (Gaskell & McLaren, 1991). In Alberta, 10 percent (or six out of sixty-four) of superintendents are female (Young & Ansara, 1998). According to Young & Ansara, an increase in the proportion of female superintendents, from 5 to 10 percent, can be partly accounted for by the reduction in the base figure; that is, the recent reduction in the number of school districts and superintendents from over 100 to 64. Over the past decade, the number of women superintendents (in Alberta) has ranged between 4 and 7.

On the superintendency issue, Grogan (1996) has commented that, "the routes to the superintendency and the methods by which superintendents are chosen have really suited men . . . the situation stems from stereotypes that women are not able to handle political conflict and political games that have to

be played." (p. 21). With respect to higher education, only 8 percent of faculties staff are female with 56 percent of these women concentrated at the instructor and assistant professor levels (Bellamy & Guppy, 1991).

In addition to being concentrated in the lowest and least secure echelons of the university structure, women also receive significantly lower wages than do their male colleagues (Gaskell & McLaren, 1991). In a study examining detailed salary data, Guppy (1989) concluded that nearly 30 percent of the wage difference for women and men was due to discrimination. Even after adjusting salary data to take into account differences between women and men in rank, age, size of university, and so forth, women were found to earn, on average, \$2,600 less than men (Guppy, 1989). The wage disparity between female and male earnings is evident in not only the educational domain but in all professional groups. Employed women earn less than employed men, irrespective of their educational attainment. The earnings of women employed on a full-time, full-year basis in 1995 were just 73 percent those of comparable men (Canadian Almanac & Directory, 1998). This figure has changed very little over the past decade.

Women are also overrepresented in educational fields such as nursing, education and French. There are very few female faculty, and almost no female full professors, in such fields as engineering, physiology, mathematics, and anatomy (Gaskell & McLaren, 1991). The consequence of all this is that the majority of students are instructed by men of senior rank, especially in traditional male-dominated fields of study from which growing numbers of women graduate. As well, the differentiation in the fields of teaching interacts with the differences by sex in the fields of study, such that, for example, female English instructors serve as role models for undergraduate female students who

then aspire to become experts in the specialties of their mentors, thereby perpetuating the initial gender division (Gaskell & McLaren, 1991).

Occupational Barriers

Gender-stereotyped beliefs about appropriate roles for women and men exert a major influence on employment opportunities and barriers experienced by each sex. Through subtle and blatant, implicit and explicit messages that permeate our culture, stereotypes deny individual uniqueness and restrict career, as well as life, choices (Worell & Remer, 1993). The impact of such stereotypes is seen in differential representation of men and women in math and science course taking in high school, and ultimately in high status careers, particularly those in math and the sciences.

The traits and behaviors stereotypically viewed as appropriately possessed by men, i.e., competitiveness and logical, initiating behaviors, lead people to see men as suited for certain occupations, especially ones involving leadership and professional or technical skills. On the other hand, stereotyped traits and behavior seen as appropriate for women, i.e., nurturing ability, cooperation, and gentleness, are associated with a more narrow range of occupations, clustered into caretaking, lower-status and lower-paying careers. These beliefs about appropriate roles for women and men, are formally and informally institutionalized into many employment structures. One notable example is occupational segregation.

Women are segregated in the labor market by whole industries, by specific occupations, and by segmentation within internal markets. Women are concentrated in the lowest-paid occupations, and are over-represented in service areas such as retail sales clerks, maids, clerical workers, and grade-school teachers (Fox, 1987; LaCroix & Haynes, 1987). High status and well-paying jobs such as transportation, construction, and mining are still held

primarily by white men, as are high status jobs in law, medicine, engineering, architecture, University teaching, and politics.

Even in female-dominated occupations, men are represented disproportionately for their numbers in senior and administrative positions (Spalter-Roth & Hartmann, 1990). In nursing, for example, a field that is 97 percent female, nearly half of the small number of men hold administrative positions (Grimm & Stern, 1974). In teaching, although women make up the vast majority of elementary school teachers, 95 percent of school superintendents and 72 percent of school principals are men (Jordan, 1992, cited in Lips, 1993). Similar patterns are found in social work and librarianship. Thus, within most occupations, there appears to be a division of labor along gender lines which is maintained through the clustering of men in higher-status, higher-paid segments of the occupation and women assigned to lower-rank, lower-wage positions.

In addition to occupational segregation, women experience employment discrimination in many forms including: hiring and promotion practices that focus on women's marital or motherhood status, appearance or age; lower salaries than men for the same or similar jobs; differential criteria for advancement and pay raise; isolation of the token woman in all-male units; hiring practices such as part-time work that deny women access to unemployment and pension benefits; assignment to lower-level tasks with less latitude and control even within the same occupational category; and finally, sexual harassment that is frequently ignored or allowed to persist (Fox, 1987; LaCroix & Haynes, 1987; Matlin, 1987).

The many forms of employment discrimination have pervasive effects on working women (Worell & Remer, 1993). Among these effects are: women leave their jobs or are driven out; increased negative working conditions;

decreased opportunity for advancement; loss of income; loss of seniority; disrupted work history; emotional stress, including loss of self-esteem, self-doubt, depression and fear (Worell & Remer, 1993). These consequences reinforce traditional sex-role messages and serve as a threat to those who deviate from these norms (Hamilton, Alagna, King & Lloyd, 1987). Further, for those women who are making career choices, they serve as a deterrent to entering the workplace, especially to entering non-traditional careers.

Even though overt sex discrimination in employment practices is prohibited by law in every province and state in North America, such practices still exist overtly and covertly. In fact, after a review of the relevant literature, Hamilton et al (1987) concluded that, "Employment discrimination is a prevalent and serious stressor in the lives of women" (p. 178).

Home-Career Conflict

Gifted females are often faced with society's conflicting expectations of women and the gifted (Wells, 1985). On the one hand, women are expected to fulfill a supportive and nurturant role (i.e., be responsible for the home and family) while on the other the gifted are expected to assertively develop their own talents (i.e., pursue meaningful careers) (Linzer-Schwartz, 1980). This normative social role in which women devote considerable time to household management and family relationships, conflicts with the traditional means of establishing one's professional career. Career establishment during one's mid-20s to early 30s, after prolonged training, is the dominant pattern in the top echelons of the science and business enterprise. The most demanding period of career opportunities and efforts occurs concurrently with the typical period of infant and preschool childrearing ages. Women who are ambivalent about parent and/or career roles face internal dilemmas, and those who strongly desire total commitment to achievement in a career, face social disapproval for

their atypical gender role choice. The costs are seen in their wages, their rate of advancement, and the stress they experience because society does not provide the types of services, supports, and employment policies that recognize and support the importance of their dual roles and that reward their accomplishments and competencies appropriately (Eccles, 1987; Epstein, 1988). Research conducted by Arnold (1993) supports the ambivalence, or conflict women experience when combining traditional family roles and nontraditional career roles.

Arnold (1993) conducted a study to examine the occupational achievements of 46 women who were participants in the Illinois Valedictorian longitudinal research project which began in 1981. Arnold found that the greatest conflicts for this group of gifted women centered around the interaction of career and personal life. The women shifted their career expectations towards less demanding careers because of their concerns about balancing work and future marriage and childraising plans. Moreover, Arnold found that only women discussed role juggling and ambivalence about prestigious careers. Academically able men anticipated continuous full time labor force participation and did not discuss role conflict in interviews. The Illinois Valedictorian Project provides some evidence that role expectations, particularly anticipated marriage age, might constrain the occupational achievement of gifted women more than actual role choices.

The conflict between traditional family roles and non-traditional career roles that women experience reflects genuine institutional barriers to combining career and family (Arnold, 1993). Prestigious male-dominated occupations demand continuous employment and long hours of work. Women perceive realistically, that high level careers require total commitment, and as a result, many talented women do not pursue top level careers because they must

juggle professional commitments with family, childrearing, and community participation (Jacklin, 1989), or they choose either to reduce their work hours or interrupt their labor force participation for family responsibilities (Fleming & Hollinger, 1994). Women who step out or slow down in their professions in order to marry and raise children do not catch up to the salary and occupational level with their bright male peers for the rest of their working lives (Card, Steele, & Abeles, 1980).

Despite the recent trend toward egalitarian attitudes, it is still widely acknowledged that women do significantly more work in terms of the childcare and household duties at home (Leroux, 1994). The publication Women in the Workplace (Ghalam, 1993) indicates that 45% of employed mothers work non-standard hours due to childcare responsibilities, and spend 3.2 hours per day performing unpaid household tasks, versus 1.8 hours for comparable men. Thus, the social expectations that continue to surround motherhood still make it difficult for women to combine motherhood with other goals. Whereas men rarely face a choice between career and parenthood, that choice is still a painful reality for many women. As Betty Friedan (1981) notes:

The price of motherhood is still too high for most women; the stunting of abilities and earning power is a real fear, because professions and careers are still structured in terms of the lives of men whose wives took care of the parenting and other details of life. The point is that equality - the rights for which women have been fighting for over a century - was, is, necessary, for women to be able to affirm their own personhood, and in the fullest sense of choice, motherhood. The point is, the movement to equality and the personhood of women isn't finished until motherhood is a fully free choice (p. 87).

An essential question is whether there really has to be a conflict between the choices of career and family for gifted girls and women. Kerr (1985) described a group of gifted women who found it is possible to achieve full potential in work and family. Kerr described this group of women as

"integrators," and found them to be the most satisfied, compared with other groups of women who opted for either relationship or career. Given this finding, maybe there does not have to be a choice made between personal fulfillment of potential and relationship, as many gifted females believe inevitable and necessary.

Society pays a high cost for its inadequate support of women's dual roles - the loss of women's talent and perspective from many high-status, time-consuming occupations, not to mention the associated health and emotional risks involved for women who want to 'do it all' in career and family pursuits. It is this perceived conflict between career and childraising roles, that more than any other factor, seriously limits women's career development and attainment (Betz & Fitzgerald, 1987).

Summary

Through differential patterns of encouragement for achievement, sex bias in educational materials, sex-biased attitudes and behaviors of school personnel, a lack of non-traditional role models, and sexism in the administrative hierarchy, our educational systems are a major source of sex-role stereotyping and institutionalized sexism. Although schools may not be the primary vehicle for gender-related achievement choices, research supports the view that schools are doing little to counteract or modify traditional sex-role stereotypes and beliefs (Eccles & Hoffman, 1984; Worell, 1989a).

The workplace is also a potent source for gender discrimination against women. In contrast to the majority of men, women face many obstacles to satisfaction and achievement in the workplace. Among these obstacles are lower wages, job segregation into lower status positions (secretary, sales clerk), fewer employment benefits, less opportunity for advancement and fewer

opportunities to use experience and education, higher layoff and job-loss rates, sexual harassment, and devaluation of personal motivation and competence (Worell & Remer, 1993). In addition, working women, more than men, face the ever present tasks of home and childcare, and suffer from work overload and multiple role-strain.

Sex-role stereotyping and institutionalized sexism impacts directly and indirectly on women's career achievement and the full development of their potential. When women realistically perceive these barriers they are less likely to choose non-traditional career paths (Worell & Remer, 1993). In addition, some researchers have commented that these external negative messages impinge on women so pervasively that the messages are not perceived as external, but rather as something wrong or deficient in the women themselves (Washor-Leihaber, 1982). Thus, these negative, external messages may become internalized and may result in conflict with women's self-interests and abilities. There are a myriad ways in which each woman may internalize her negative external experiences. The next section will review the internal barriers that impact upon women's development.

Internal Barriers

A variety of theories have been proposed to explain the psychological factors which underlie women's failure to achieve compared to men. The "Fear of Success" syndrome has been, by far, the most researched (Kerr, 1985).

Fear of Success

Horner (1972) developed the concept of Fear of Success (FOS) to explain the tendency of women to underachieve in competition with men and to perceive success negatively. Horner believed that FOS was a stable personality trait that developed early in childhood, and was directly related to

sex-role identity development. Further, she believed that FOS was the key factor accounting for differences in female and male motivation, and as long as achievement and being "feminine" were societally defined as conflicting, women would internalize these conflicts.

Subsequent independent research has been equivocal with respect to the FOS concept put forth by Horner. In particular, the context of the successful situation, i.e., success in a female- or a male-dominated occupation, success in a competitive or cooperative situation, significantly impacts upon individuals' FOS scores. For example, research has shown that women undergraduates believe that competition and top grades threaten their male peers and undermine their own sense of femininity (Linzer-Schwartz, 1980). However, recent anthropological studies of boys and girls in competition and conflict, reviewed by Tannen (1990), showed that girls do engage in competition and conflict with each other and with boys, but that they will more often compromise to preserve intimacy. In another study, Tomlinson-Keasey & Little (1990), reporting on the personal and professional accomplishments of gifted women, showed that even when gifted women understand how irrational or impractical it is to underachieve, they may continue to do so if they believe success will result in a failure of intimacy.

Findings such as these have led many researchers to conclude that FOS is not a stable personality trait (Condry & Dyer, 1976; Paludi & Fankell-Hauser, 1986; Tresemer, 1977, cited in Kerr, 1985), but rather a manifestation of the cultural restrictions of women, i.e., being successful at a career but risking relationship loss. Unfortunately, our culture communicates the message that success is more congruent with the male than the female role; for females the attainment of success may have negative consequences. Thus, the heavy cost of avoiding these consequences is reflected in the underachievement of women

who are most likely to be successful. Although more current research suggests that fear of success can be eliminated with age and experience (Reis, 1991), preliminary findings in a study of high school valedictorians indicate that female students who had done well in high school lose confidence in their ability after a few years of college (Arnold & Denny, 1985). The effects of this loss of self-confidence can influence the rest of a young woman's life if it causes changes in college plans or goals for graduate study.

Cinderella Complex

Dowling (1981) proposed the "Cinderella Complex" as the affliction which prevents bright women from attaining success. Based on her interviews with women who attested to difficulties with success, she concluded that there was a self-defeating tendency to want to be taken care of or to be rescued from the responsibility of taking care of oneself. Dowling advanced the theory that personal and psychological dependency was the chief force suppressing today's women. She suggests that women caught up in the Cinderella Complex are likely to: acquiesce to the expectations of their parents; judge men by their competence to take care of them; refuse to commit to permanent jobs or careers; become incapable of pursuing their own goals; and base their self-worth on the man they marry. Although Dowling's work is not based on a scientific study there is some research which supports her ideas.

Studies by Tangri (1974), and Holland & Eisenhart (1990) for example, show that girls who choose nontraditional or "pioneer" careers are not likely to be pressured by parents to date and marry. In addition, findings suggest that career-oriented women often come from homes that foster independence, achievement, and active exploration (Kerr, 1994). These career-oriented girls generally have working mothers as models or mothers who are positive about careers, along with well-educated fathers who are proud of them. On the other

hand, women coming from homes where independence, achievement, and exploration are discouraged, and where parents are unsupportive about careers, may be particularly at risk for experiencing the handicaps associated with the Cinderella Complex.

Imposter Syndrome

The Imposter Phenomenon offers yet another example of bright women's internal barriers to achievement. The "Imposter Phenomenon" is a term developed by Clance and Imes (1978) to describe a feeling of phoniness expressed by some female high achievers. Individuals who have attained a high level of success, but feel like imposters, assess that they do not deserve the achievement and expect to be "found out." "Imposters" do not enjoy their accomplishments, and negate external evidence of their abilities (Clance & Imes, 1978). Based on their research with high achieving women, Clance and Imes (1978) speculated that bright women learn to doubt their own abilities in the absence of appropriate reinforcement for accomplishment. Research supporting the imposter syndrome comes from Kerr (1985, 1994).

Kerr (1985) conducted a longitudinal study which explored the achievements of women identified as gifted in elementary school. Based on ten- and twenty-year follow-ups of 23 women who were graduates of The Accelerated Learning Program, Kerr found that more than half of the women and girls' in her study had negative views of their academic abilities, denied their giftedness, and in general consistently tended to underestimate their abilities. Kerr believes the imposter phenomenon for women is related to the internalized effects of sex-role stereotyping. Worell & Remer (1993) commented how women needed to explain away their accomplishments, i.e., "I didn't deserve it," because success at difficult tasks that require competence is

inconsistent with both societal expectations for women and with many women's self-concepts (p. 265).

Insufficient Assertiveness

Assertiveness has been cited as a major internal barrier to women's career development and achievement (Epstein, 1970). Non-assertion restricts women from expressing the abilities they have. Assertiveness skills are not typically taught to girls and traditionally are not sanctioned for women (Worell & Remer, 1993). Assertiveness skills are especially important for confronting and persisting in the face of discriminatory barriers in educational and occupational systems. For example, Nieva & Gutek (1981) found that females who were non-assertive were more likely to be turned down if they applied for non-traditional gender-role jobs. Women who are higher in assertiveness are more willing to engage in career activities of non-traditional occupations (Nevill & Schlecker, 1988; Leroux, 1994).

Attributions of Success

While gifted males may attribute their successes to their abilities, research indicates that gifted females tend to attribute their successes to sources outside of their abilities, such as chance or luck (Callahan, Cunningham & Plucker, 1994). Dweck & Licht (1980) conducted a study to explore how males and females experience success/failure. They found that when males experience success, they are more likely to attribute their success to their ability, whereas women are more likely to attribute their successes to luck or effort. Males are more likely to attribute their failures to chance or lack of effort, whereas females are more likely to attribute their failures to lack of ability. In an examination of the attitudinal variables characterizing students who have achieved success in science, i.e., 146 winners of the 1983 Westinghouse Science Talent Search, Subotnik (1988) found that female subjects " . . .

reported more concern with social impacts of scientific research, less variability in their self-image as a scientist, and a tendency to attribute success to hard work and dedication rather than intelligence or creativity than did male subjects . . . " (p. 19). Finally, a study conducted by Kramer (1991) found that middle-grade gifted females also attribute their successes to hard work rather than ability. Kramer commented that female attributions of success to external sources and of failure to internal sources, contributes to women having less self-confidence and to their avoidance of some achievement situations.

While this gender difference may seem to have a psychological foundation, there is evidence that attribution-making is a socialized phenomenon. According to gender-schema theory, only those self-beliefs congruent with the individual's gender schema are incorporated into the self-concept (Bem, 1981). This theory helps to explain why gifted female adolescents report higher social and artistic (stereotypically feminine) abilities, values and interests than investigative and realistic (stereotypically masculine) ones (Hollinger & Fleming, 1984). These perceptions, as well as self-perceptions of personal attributes, have been found to discriminate women aspiring to nontraditional math and science careers from those aspiring to traditional, lower status, stereotypically feminine careers (Hollinger, 1986). Similarly, agentic attributes may be left out of the self-concept if they are seen as stereotypically masculine. This is distressing since these attributes are predictive of self-esteem, educational, and occupational confidence as well as general life satisfaction (Hollinger & Fleming, 1988). High self-esteem seems to protect gifted girls from fears of social rejection that may accompany high achievement and serves to build the self-confidence needed to follow through on high goals. Thus, young women of high ability who attribute success to hard

work or luck rather than their abilities will not be as confident or as willing to take risks in their decision-making and/or in the achievement of their goals.

Math proficiency

The "math filter," coined by Sells (1980), effectively prevents the majority of women from entering high-status, high-paying occupations. In a study of freshmen at the University of California at Berkeley, Sells found that only 8 percent of the women, versus 57 percent of the men, had had four years of high school math. Yet four years of math were required to be eligible for three-fourths of CU's academic majors. Avoiding math effectively locked 92 percent of college women out of most of the numerous academic options. This characteristic avoidance of math and math-related courses has a powerful impact on women's career development, particularly in today's modern technological society.

Having a strong mathematics background is pivotal to many of the best career opportunities in our society; for example, engineering, scientific, and medical careers, computer science, business, and the skilled trades. Given the important link between having a math background and career opportunities in our society, female's tendency to avoid math coursework becomes one of the most serious barriers to their career development (Betz & Fitzgerald, 1987). It has been documented that girls take fewer math courses than do boys beginning in high school and continuing through college (Pedro, Wolleat, Fennema, & Becker, 1981). Moreover, boys who fall into the lower half of the achievement distribution are more likely than their female counterparts to continue the study of math (Pedro et al., 1981).

The breakdown of female's full participation in math begins in adolescence, in about the 9th or 10th grade. Prior to this point, gender differences in math achievement and participation are not generally found

(Chipman & Wilson, 1985). As girls begin the secondary school years, they stop taking math, and their math achievement test scores begin to fall below those of boys. Evidence that it is math coursework that is vital to math achievement comes from the finding that gender differences do not occur until females stop taking math, and that girls who continue the study of math achieve math grades as good as those of the boys (Chipman & Wilson, 1985). Although highly able females get good grades in math and science they tend not to choose math and science courses or careers (Yewchuk, 1992). The avoidance of mathematics courses in high school closes a number of college study options for women, thus helping to perpetuate male-female segregation into different careers.

The reasons for the low participation of women in math, science, and technology are many and complex. One major explanation is derived from socialization differences, which influence attitude towards, and self-confidence in math learning and performance (Beth & Fitzgerald, 1987). Females have been found to have less confidence in their math ability in comparison to males even when their objectively measured abilities are equal (Chipman & Wilson, 1985). The bases of gender differences in math performance, societal stereotypes and attitudes, convey the beliefs that "math is a male domain" (Hyde, Fennema & Lamon, 1990a), and that girls do not need to study math (Arnold, 1979). Actually, males are more likely than females to stereotype mathematics as a male domain (Hyde, Fennema, Ryan, Frost, & Hopp, 1990b). Considerable research has explored the degree to which girls have internalized societally conveyed beliefs.

For example, Fennema & Sherman (1977) conducted a study with high school seniors (589 female, 644 male, predominantly white 9th-12th grade students) to investigate the relationship between socio-cultural factors and sex-

related cognitive differences in mathematics achievement. Fennema and Sherman found with high school seniors that males had more confidence in their math ability than did high school females after the 8th grade, and concluded that female's lack of confidence was a major factor contributing to math avoidance.

Similarly, Hollinger (1986) found a strong relationship between gifted girls' confidence in their math abilities and their plans to pursue math-related careers. Self-confidence may be a stronger predictor of adult achievement than high grades or high aspirations (Eccles, 1985). Further related to the issue of self-confidence is the widespread belief that boys do better than girls in math. Sadker & Sadker (1985) reported the belief of male superiority not only among high school boys and girls, but in both male and female teachers, and concluded that a self-fulfilling prophecy of male success and female failure in math may be unconsciously set up by teachers.

Finally, another important factor explaining female's avoidance of mathematics may lie in the task value that female versus male students attach to various achievement activities, and in the different factors that influence these values (Eccles, 1985). One study of mathematics and science participation among female university students found that the reason given most often for avoidance of math and science was a lack of interest in and enjoyment of these academic subjects (that is, low intrinsic value) - a reason that was cited far more often than perceived difficulty or lack of career relevance (Lips, 1984, cited in Lips, 1993). In another study of computer-related attitudes among university students, women's intentions to major in computer science was related more strongly to interest and enjoyment of computers than to a more pragmatic desire to find a high-paying, advancement-oriented job, while the reverse pattern was true for men (Lips & Temple, 1990). These findings suggest that females and

males, at least in high school and university, may be motivated by different factors in their pursuit of achievement in mathematical, scientific, and technical fields.

In general, there are many varied and complex reasons for female avoidance in the mathematics/sciences domain. However, one fact remains certain, and that is that young women who have continued coursework in mathematics and science have a far broader range of career options than do the majority of young women who have avoided such work. An emphasis on changing societal expectations, and the expectations of girls and women with regard to the appropriateness, and necessity of mathematics for women, is essential to the facilitation of women's career development. Without significant changes in our current educational and vocational systems, women will continue to underachieve, or be perceived as underachieving.

In view of the internal barriers outlined above, it may be that it is not a phobia, complex, or other psychological deficit which prevents gifted women from achieving their full potential. It may be, paradoxically, that it is the relatively healthy adjustment of gifted women in the face of dual or multiple roles that acts as a barrier to their success. In other words, the gifted women understands that she is gifted and has not really fulfilled her potential, but she also understands that she is a female, and that her experiences are simply typical for women in society (Kerr, 1994). Confined within their restricted roles as wives, mothers, teachers, and nurses, gifted women adjust to the disability of being female. This concept, referred to as Psychological Adjustment, will be described in the next section.

Psychological Adjustment

Psychological Adjustment is an internal barrier that is not related to any unhealthy psychological state, even though it too, often results in perceived

underachievement. Rather, it is the process of resourceful adaptation to the environment, of compromising and adjusting in order to cope or to survive psychologically (Kerr, 1994). Kerr's concept parallels that put forth by Sternberg (1985, 1988b), in his *Triarchic Theory of Human Intelligence*. Sternberg states that there are multiple loci of intellectual giftedness, the categories of which are affected by underlying intellectual components. One of these is Adaptation. Within Sternberg's theory, adaptation refers to "the adjustment of one's self and one's behavior to the environment in order to provide a good fit to that environment" (Sternberg, 1991, p. 50). Research suggests that gifted individuals, especially females, are often good adapters (Wagner & Sternberg, 1985).

To illustrate, the norm of our society is for gifted women to lead an average life. Consequently, as a teenager, the gifted female will deny her giftedness, for moving out of societal expectations for females as mother and nurturer can lead to loneliness and ostracism if she deviates too far from cultural norms in terms of competence and achievement (Noble, 1987). Thus, she becomes adept at adapting to the norm expected of her. It is only later in life when the woman comes to realize that she is gifted, and had not really fulfilled her potential, but that she had accomplished a lot within the limitations of her lifestyle. Thus, it is her healthy adjustment that prevents achievement, her admirable self-acceptance that precludes self-actualization (Kerr, 1994).

On the issue of adjustment, Tavis (1992) has pointed out that people who are both different from the average population and lower in status, must learn to speak and behave like the more dominant group. From the earliest research on the gifted, it has been clear that of all groups, gifted girls are the most adept at adjusting (Kerr, 1994). For example, Terman and his colleagues (1959) first documented the superior psychological health, social knowledge,

and social adjustment of gifted individuals, male and female. Similarly, the homemakers and underemployed women in Kerr's (1985) sample, were for the most part, happy and busy. Only later in life, like Terman's women, would there be a voicing of any dissatisfaction they may have had.

It seems ironic that psychological adjustment - not psychological disability - may better account for women's perceived failure to achieve their potential than the other internal factors combined, though clearly all these factors interact. However, a society that wastes female brilliance has made it the norm for gifted women to lead an average life, and gifted women have largely adapted to that norm. . . well-adjustedly (Kerr, 1994).

Summary

In view of the many discriminatory and social attitudes which exist, it is not surprising that many gifted women express doubts about themselves and/or their abilities. However, there is some research which shows that not all gifted females will be adversely affected by the various internal, and external barriers described above. Among a sample of 284 gifted adolescents, Hollinger and Fleming (1984) found that 29 percent evidenced no sign of internal barriers. Some young women in their sample, albeit a small proportion, appeared to have developed strategies for coping with such barriers. Some of these characteristics, which are common to high-achieving women, will now be discussed as factors aiding in gifted women's development of potential.

Factors Contributing to Achievement

Childhood Experiences

Recent research indicates that childhood interests have an important influence in the career development of eminent women. Schlosser & Yewchuk

(1995) found, using a research sample of 197 eminent Canadian women, that the childhood "passion" of reading was the most common interest cited. This childhood passion extended into adulthood and had a primary impact on their adult attainment of eminent status. Another important finding was that 82 percent of the women studied had the perception of being "special" within their families of origin. By being treated specially or by having a particular role in the family dynamics, 76 percent of these women experienced being valued by being differentiated from their siblings. They reported being special because of their birth order, individual talents or achievements, state of health, or a specific aspect of their personality. These findings support those of Kerr (1985, 1994) who found that of the 23 eminent women she studied, more than half of these women had spent much time in early years reading, and more than half of these women felt different or special within their family structure.

Supportive Relationships

Research has shown that the educational and occupational choices made by young women are influenced by the support they receive from the important people in their lives. For example, the early relationship of females with their mothers appears to be an important factor regardless of whether the mother works at home or outside of home. Marshall (1984) conducted a study on the maternal influence of successful women managers and found 26 percent of the successful women cited their mother as being most influential in their development. Marshall (1984) suggested that by positively valuing their mother's role these women gained an appreciation of their own feminine strengths and abilities, leading to a sense of self-acceptance which was not contingent upon male approval. By maintaining their femininity these women may have created a more androgynous role for themselves, combining the best of both male and female characteristics (Marshall, 1984).

Fathers, too, play a vital role in creating expectations of achievement in their female children (Raymond & Benbow, 1989). Research has shown that high achieving women often have supportive and encouraging fathers (Hoffman, 1974), and in later years, supportive and encouraging spouses (Horner, 1972). Research supporting the influential role that fathers have in the lives of women who are successful comes from a British study by White, Cox and Cooper (1992).

White et al. (1992) studied women who had achieved extraordinary levels of career success in an effort to gain insight into the career and personal experiences which facilitated their career development. These researchers found that of the 48 women studied, approximately 72 percent reported having a special relationship with their fathers. These women reported their fathers actively supporting and encouraging them in the pursuit of traditional, as well as nontraditional interests. White, Cox and Cooper believe that, through the special relationship with their father, these women found a role model with whom they could identify, and developed what are traditionally thought of as male characteristics: drive to achieve, an orientation to a task, enjoyment of competition and capacity to take risks. Other studies have also have found that strong support and encouragement from significant males can be an important motivating factor in the pursuit of a career, particularly for women in nontraditional occupations (Kutner & Brogan, 1980; Blair & Lupart, 1996).

Mentor relationships are another significant influence in the lives of successful women. Ilgen and Youtz (1986) suggest that the career and psychosocial benefits of mentoring increase the likelihood that women will receive co-operation of peers and their subordinates which may enhance their probability of success. Riley and Wrench (1985) found that women who had one or more mentors reported greater job success and satisfaction than women

who did not. In a survey of 98 randomly selected successful women managers and entrepreneurs, Clutterbuck and Devine (1987) found almost all of their sample (94 percent) said that a mentor had a significantly beneficial impact upon their careers. Improved self-confidence and self-image were the most commonly cited benefits, mentioned by 34 percent of the women. Another frequently cited reason was that the mentors helped the women to focus their aspirations and acted as role models for many of them (Clutterbuck & Devine, 1987).

Kerr (1985), Leroux (1986), and Rose & Larwood (1988) have all suggested that females benefit from same sex mentors to facilitate identification and role modelling. Other researchers contend that male mentors might be problematic in that this might reinforce the dependence of females on male measures, male-defined values or male approval (Shapiro & Farrow, 1988). Whatever the gender of the mentor, research supports the significance of such relationships, for even in areas relatively open to women, a mentor is often necessary for providing intellectual and emotional support and in strengthening the chances of a superbly skilled but non-aggressive woman to reach the top (Kerr, 1994). Indeed, recognition by an influential mentor is the variable that most strongly correlates with women competing with men in the realm of mathematics/science-related occupations (Arnold, 1993; Blair & Lupart, 1996; Subotnik, Duschl & Selmon, 1993; Subotnik & Steiner, 1994). The influential attitudes and values from others that are internalized by the gifted female are vital in determining whether or not she emerges with a sense that she can excel, notwithstanding the fact that she is a woman (Gordon, 1988).

Personal Characteristics

Certain personal characteristics are evident in many women who achieve career or vocational prominence. Research has identified the ability "to

fall in love with an idea" (Kerr, 1985, p. 69), to have "an intense love affair with their work" (Froggatt & Hunter, 1980, p. 180), or the need to follow "a powerful dream" (Daniels, 1985, p. 429). On the basis of her research, which involved studying the personal characteristics of 65 women successful in a variety of professional disciplines, Northcutt (1991) found women who were successful to be consistently responsible, competent, and committed to their careers. Northcutt further commented that "successful women appear to have high self-esteem, they choose work to find personal fulfillment as well as for financial gain, and their career paths are marked by the need for flexibility and accommodation of dual roles" (p. 134).

Other personal characteristics contributing to the achievement of gifted women include assertiveness and cooperation (Leroux, 1994), hard work, determination, perseverance, commitment, and the willingness to adapt, to learn and to change (Yewchuk & Chatterton, 1990). Another factor related to personal characteristics and contributing to women's achievement is women's own interests and values. Although this factor has only recently been discussed in the literature on women's career and psychological development, it appears to hold particular promise for resolving some of the aforementioned issues that relate to the realization of potential by high-achieving women.

Values

A number of authors have recently suggested that women's development is different from men's, and that women's valuing of relationships is a central feature of their development and achievement in our society (Gilligan, 1982; Miller, 1986; Surrey, 1985). Further, men and women's different personal value structures will affect their educational and occupational choices. There is some evidence to support the suggestion that values influence career and other life role decisions.

A wide variety of studies suggest that females rate social values and helping, person-oriented values, higher than males do (Gilligan, 1982; Sutherland & Veroff, 1985). Moreover, females are more likely to rate working in social service agencies or in schools as more desirable than the self-employment or technological careers rated positively by males (Erb, 1983). It has also been found that females are more likely to consider their own intrinsic interest in the field, and the human service aspects of the job such as the opportunity to help others, work with people, and be creative, more important than the typical, identified male-expressed interests of becoming a leader, money, status, or freedom (Lips, 1984, cited in Lips, 1993; Subotnik, 1988).

For example, in a study of computer-related attitudes among university students, women's intentions to major in computer science were related more strongly to interest and enjoyment of computers than to a more pragmatic desire to find a high-paying, advancement-oriented job, while the reverse pattern was true for men (Lips & Temple, 1990). Research suggests, as well, that one reason for college males' greater tendency to choose courses and career goals in mathematics and science is their concern with status and success. College men and women see science careers as equally difficult and demanding, but men seem to see this as a more positive feature than women do (Lips, 1993).

Finally, several studies suggest that women integrate achievement and affiliative needs whereas men are more likely to compartmentalize their various needs, possibly eliminating potential conflict between these needs (Sutherland & Veroff, 1985). In support, the work of Leslie (1986), and Paludi & Fankell-Hauser (1986) suggests that men are more likely to exhibit a single-minded devotion to one particular goal, especially their occupational goal. In contrast, women seem more likely to be involved in, and to value competence in several

activities simultaneously, to plan a multiphased life path, and to worry about the interconnectedness of family and occupational domains.

The above studies demonstrate that males and females may value and be motivated by different factors in their pursuit of achievement in mathematical, scientific, and technical fields. If this is so, we might expect women to value, and to be motivated to achieve in, work environments that offer a relational component and involve collaboration with others. Accordingly, this should have an important impact on the way we view women's achievement. Women's achievement has traditionally been measured against societal standards of money, power, and prestige. However, for many women, achievement is not limited to external indicators, such as career status or educational degrees, but includes personal and interpersonal or relational achievements as well (Denmark, 1993). Given this perspective, the career development of many women cannot be viewed in isolation but rather must be viewed in relation to other life spheres.

Conclusion

In conclusion of this segment, the review has presented the influential factors affecting women's development of potential and failure to achieve at all professional levels. Though many women show promise as indicated by their earlier school grades, too few achieve eminence in adulthood. It seems that attainment of superior grades and progress in school do not necessarily dictate similar progress in more advanced education and careers. No one explanation has emerged as the primary cause of highly able women's underutilization or representation in the mathematic, scientific, and technical fields. The previously discussed areas relating to traditional and contemporary career development theories, external/internal barriers, and factors facilitating gifted womens'

achievement, all provide insights into women's achievement behaviour and subsequent career-related decisions. However, in order to understand the realization of potential in high-achieving women we need to explore women's achievement across a variety of life roles and not just within the work role. We need to look at the values that women possess, the life role choices they make, and the life satisfaction they have. Only then will we begin to understand whether women are "realizing" their potential.

CHAPTER IV

RATIONALE, CONCEPTUALIZATIONS, RESEARCH QUESTIONS

Rationale

Although there have been many studies conducted with respect to realization of potential in gifted women, the majority of these studies have focused on sex differences in achievement-related patterns. Comparing males and females on selected variables relative to achievement patterns has yielded useful information related to gender differences but provides limited indepth data on female achievement behavior. By focusing on gender differences, individual differences among women have been largely ignored (Gerson, 1986). As a consequence, very little systematic, quantitative information has been gathered regarding the more typical female achievement domains, such as the academic accomplishments of one's offspring and/or one's pupils, the satisfaction of one's clients, or one's contributions to local organizations (Eccles, 1994).

Even less qualitative information has been gathered regarding the meaning of various achievement-related activities to gifted women (or men) (Eccles, 1994). For example, we know very little about the ways in which gifted women express their intellectual talents or why women think they make the achievement-related choices they do. The value of female accomplishments has been measured against a male standard of achievement that has resulted in a distorted view of women's achievement patterns and occupational choices (Gutek & Larwood, 1987). Newly emerging literature in the area of women's achievement is finding that women's attitudes, values, expectations, and desires relating to work, family, and achievement often deviate from those of men (Fleming & Hollinger, 1994; Gilligan, 1990).

The present study extends previous efforts to increase understanding of factors that support the achievement of gifted women across different ages, particularly in the mathematic and science-related domains. To ameliorate shortcomings of past research, the Achievement-Choice model developed by Eccles and her colleagues (Eccles, 1985) was utilized (The Achievement-Choice Model is previously discussed under the heading "Contemporary Career Development Theories"). This model has been substantially developed over a number of years, and validated in the mathematics area to investigate the sources that contribute to the dynamic interaction of achievement-related decisions and related consequences in the sciences (Eccles, 1985, 1986a, 1986b, 1987; Eccles & Jacobs, 1986). Moreover, the Achievement-Choice Model is a theoretical framework that was developed to guide current and future research endeavors aimed to identify the sources of underachievement in gifted women.

Data for the model was drawn from samples of junior and senior high students. Comparisons between males and females were made on a number of selected variables in order to increase understanding of sex-differentiated achievement patterns in mathematics and science. While some research exists, there does seem to be a paucity of work at the university level (or beyond) on variables that contribute to achievement-related choices for females.

Longitudinal and cross-sectional studies are needed to provide information on the lifespan development of women and the diversity of life choices they make.

Given the lack of information we have on gifted females, the purpose of the present study is to explore the relationship between personal values, achievement-related choices, and life satisfaction in a distinct population of two groups of high achieving females. The importance of subjective task value from Eccles model is stressed as is the need to study achievement from a female

perspective. While the nature and complexity of the undertaking is not conducive to an experimental design, a questionnaire/interview format allows for both quantitative and qualitative analysis of the variables identified as relevant to the achievement of gifted women. Specifically, this analysis:

- a) provides information on the achievement-related choices of women ages 18 to 33.
- b) serves to substantiate experimental claims in previous research findings.
- c) examines the relationship between variables associated with women's achievement-related decisions.
- d) provides a comparison between two different age groups of high achieving women.
- e) helps to develop a profile of factors contributing to successful achievement in women.
- f) provides a framework for further research.

Conceptualizations and Variable Specifications

High-achieving - Women who have excelled academically as designated through traditional/non-traditional measures.

Shad Valley - University-based Summer program for high school students gifted in mathematics and/or the sciences.

Time Band 1 (or Younger Shads) - Women who have either applied or participated in the Shad Valley program during the years 1991 - 1996.

Time Band 3 (or Older Shads) - Women who have either applied or participated in the Shad Valley program during the years 1981 - 1985.

Life Roles - refers to work and non/work roles in adult life (i.e., doctor, student, mother, daughter).

Realization of potential - More broadened interpretation from that commonly used in the gifted literature; for the present study this term will refer to personal and public achievements across a range of life-roles and in all educational, occupational, social and familial spheres.

Research Questions

What are the most important work/non-work values and life-roles of each group?

Do the work/non-work values and the participation in, commitment to, or role value of various life-roles by the two groups of women differ from one another?

How do the two groups of women define achievement?

What are the social influences and their degree of impact in women's life-role choices?

Do the two groups of women report differences in areas of life satisfaction?

CHAPTER V

METHOD

Background

This study represents a component of the second stage of a three-part Social Sciences and Humanities Research Council of Canada (SSHRC) funded study of female (and male) achievement in mathematics/science-related domains. Currently, a fifteen year retrospective study is being conducted by a research team under the leadership of Dr. Judy L. Lupart, on the examination of the Shad Valley program and its long-term impact on the advancement of interest and expertise for males, and particularly females, gifted in the sciences. As previously noted, Shad Valley is a university-based Summer program for high school students gifted in mathematics and/or the sciences. Shad Valley students are selected from across Canada to participate in one of eight university-based programs, with emphasized experiences in science, technology, and entrepreneurship. Related sponsorship and work experience are provided by participating business companies.

The purpose of the first stage of the study was to form a data base from the descriptive analysis of selected variables in the application forms of 600 randomly selected males and females since the Shad program inception in 1981, to identify educational and personal factors pertaining to high achievement, and to analyze differences between males and females on selected variables (Lupart & Barva, in press).

Each application form had 4 main parts: (1) general information (application year, city and province of residence, birth date, sex, languages spoken, cultural background); (2) grades in different subjects in the two last years of high school along with teachers' and principals' comments; (3) other

questions such as science, engineering, and computer experience, attitude towards math, activities in and out of school, favorite books and magazines, number of awards received, musical instruments played, and (4) a 25 item sub-questionnaire on personal characteristics and academic social behavior of students completed by teachers (Lupart & Barva, in press).

The analysis of the year one data was carried out on the basis of two comparative groups; (1) Male and Female, and (2) Shad Participants and Non-participating Cohorts. Individuals from Shad Valley were selected for this research study because of their identification in high school for high achievement and strong potential in the sciences. The total number of participant and cohort applications available was approximately 7000. Of this number, 600 individuals were randomly selected from the application pool. In the final analysis, 576 subject applications, including 283 Shad Valley applicants who participated in the Shad Valley program and 293 non-participating, qualified applicants at three different phases, including years 1981-1985, 1986-1990, and 1991-1995 were selected. These data were analyzed to address specific questions concerning educational program history, the influence of teachers in pursuit of science courses and programs, male and female student attributes and characteristics, and general demographic information (Lupart & Barva, 1998).

Stage two of the study is currently in progress and has as its focus the investigation of factors (i.e., abilities, aptitudes, past events, self-schemata, perception of needs, role identity, and input of significant others) that influence achievement-related decisions and related consequences using the model developed by Eccles and her colleagues (Eccles, 1985, 1986a, 1986b, 1987; Eccles & Jacobs, 1986). On the basis of the stage one data analysis, and age-

related adjustments, an adaptation of the questionnaire used in previous work by Eccles et al., a comprehensive questionnaire was developed. This questionnaire, along with The Values Scale and The Salience Inventory were sent out to approximately 180 of the subjects selected for stage one, who could be tracked to their current address. Approximately 120 of the questionnaire packages were completed and returned, and follow-up interviews were carried out with 60 of the subjects who returned their questionnaires. The data from this stage is currently being analyzed.

Overview of Present Study

The present study has been pursued within the larger framework of the Shad Valley study (as discussed above). The purposes of the present research were twofold. The first involved contacting those females (approximately 44 from a total of 73 from Phase 2) identified as high-achieving in high school in order to explore through a series of detailed questionnaires a number of areas that previous research had indicated might be relevant to their academic and occupational achievement. The intent was to move beyond a static profile of factors related to women's achievement (or underachievement), by exploring relevant dimensions attributed to high-achieving women during different phases of their life. The cross-sectional aspect of this study provided an opportunity to explore age-related patterns of values and life-role choices across a broad spectrum from the end of high school to beginning mid-life. Previous studies in the area of women's achievement have tended to concentrate on a more restricted age range.

The second component of the study involved in-depth, open-ended telephone interviews, with female volunteers from the first component in order to explore experiences, life satisfaction, and social influences on interest and

involvement in science-related courses, programmes, and careers. Using open-ended interviews provides more consistent information about attempts to understand the world from the participant's point of view, to unfold the meaning of the participant's experience, and to uncover their lived world prior to scientific explanations (Kvale, 1996). Again, the cross-sectional nature of the study allowed examination of the possibility that factors that seem relevant to women's achievement might vary at different age levels.

Subjects/Sample

Of the 576 high achieving individuals in the Phase 1 study, a total of 180 individuals (female and male) from the Western provinces, Ontario, Quebec, and the Atlantic provinces were contacted for their voluntary participation in Phase 2. For the present study, a total of 73 women from two different time bands were contacted for further investigation. The following criteria were set for selection:

1. The subjects were females.
2. The subjects were participant or non-participant cohorts of the Shad Valley program during 1981-1985, or during 1991-1995.
3. The requirements for application to Shad Valley are based on traditional (i.e., high school grades) and non-traditional (i.e., letters of reference, involvement in extracurricular activities) measures of achievement.

A total of 44 out of 73 (an estimated 60%) women contacted indicated a desire to participate in the study. Of this number, 21 women formed Time Band 1 (years 1991-1995; mean age = 20.8 years), and 23 women formed Time Band 3 (years 1981-1985; mean age = 30.6 years). All 44 women were mailed a questionnaire instrument package. In addition to completing the instrument package, a further ten of the forty-four women (5 women from Time Band 1

(years 1991-1995; mean age = 21.4 years); 5 women from Time Band 3 (years 1981-1985; mean age = 31.6 years) were randomly selected to also participate in the telephone interview. The women who participated in the telephone interview were comprised of participant/non-participating cohorts of the Shad Valley program. A breakdown of the women by age, marital status, academic and/or occupational level, and ethnic origin is provided in Table 1. Table 2 provides the same information for those females who also participated in the telephone interview. This sample provided a fairly homogeneous group in terms of ability level.

Table 1 Mean age, marital status, academic and occupational status, and ethnic origin for Younger and Older Shads.

	<u>Younger Shads (N=21)</u>		<u>Older Shads (N=23)</u>	
<u>Mean Age</u>	20.8 years		30.6 years	
<u>Marital Status</u>	Single	20	Single	6
	Steady Relationship	5	Married	14
	Common-law	1	- with children	9
			- without children	5
			Engaged	1
			Divorced	2
<u>Academic Status</u>	College	2	University	4
	University	18		
			<u>Degrees Obtained</u>	
			Bachelors	10
			Masters	6
			D. D. S	1
			Ph.D	1
	<u>Academic Major</u>		<u>Academic Major</u>	
	Biochemistry	2	Biological research	2
	Biology	4	Business	7
	Computer Science	1	Cancer Research	1
	Education	1	Computer Science	1
	Engineering	4	Engineering	3
	General Arts	4	Humanities	1
	Media Advertising	1	Library Science	1
	Medicine	3		
	Psychology	1	Social Work	1
			Speech Pathology	1
			Unknown	1
<u>Occupational Status</u>	Full-time Students	20	Homemakers	2
	Full-time Workers	1	Full-time Students	2
			Full-time Workers	14
			Part-time Workers	5
<u>Ethnic Origin</u>	Caucasian	17	Caucasian	21
	Chinese-Canadian	3	Chinese-Canadian	1
	East Indian-Canadian	1	East Indian-Canadian	1

Table 2 Mean age, marital status, academic and occupational status, and ethnic origin for Younger and Older Shads who participated in telephone interview

	<u>Younger Shads (N=5)</u>		<u>Older Shads (N=5)</u>	
<u>Mean Age</u>	21.4 years		31.6 years	
<u>Marital Status</u>	Single	5	Single	3
	- Relationship	1	Married	2
	- Common-law	1	- with children	1
<u>Academic/ Occupational Status</u>	University	4	<u>Degrees Obtained</u>	
			Bachelors	1
			Masters	2
			Ph.D	1
			Post-Doctoral Fellow	1
	<u>Academic Major</u>		<u>Academic Major</u>	
	Biology	1	Business	1
	Business	1	Cancer research	1
	Education	1		
	Engineering	1	Humanities	1
	Psychology	1	Social Work	1
			Speech Pathology	1
<u>Occupational Status</u>	Full-time Students	4	Full-time Workers	4
	Full-time Workers	1	Part-time Workers	1
<u>Ethnic Origin</u>	Caucasian	3	Caucasian	5
	Chinese Canadians	2		

Design/Procedure

A questionnaire/interview design was utilized in this study. It allowed for the examination of a multitude of factors linked to academic and occupational achievement in high achieving women and for an exploration of the relationships that might exist between these factors. Additionally, it was hoped that the range of information a questionnaire could provide would corroborate findings and suggestions of relevant factors already cited in both theoretical and experimental work.

Permission to conduct the study was granted through the larger Shad study framework, which is funded jointly by the Social Sciences and Humanities Research Council of Canada and Northern Telecom, under the auspices of a Science and Culture Canada joint initiative. For this study, female participants from across Canada were contacted by telephone. Each phone call, lasting approximately 15 minutes, included a brief description of the study and requests for: permission for voluntary participation; permission for a personal interview; and an indication of marital and academic or occupational status.

Three questionnaires were mailed out to all female participants. The three questionnaires were: The University of Michigan Study of Adolescent Life Transitions [adapted], The Values Scale and The Salience Inventory. Only the latter two instruments were analyzed for this study (See Appendices C and E). Self-addressed, stamped envelopes, explanatory letters (See Appendix A), consent forms (See Appendix B), and deadline dates to return questionnaires were included. After eight weeks, follow-up phone calls were conducted and four additional questionnaire packages replacing misplaced originals were mailed out. The collection of data from the questionnaires took place between July - December, 1997.

The telephone interview was conducted with a subsample of 10 randomly selected participant/non-participant cohorts from the total sample of 44 women (5 women from Time Band 1 (years 1991-1995); 5 women from Time Band 3 (years 1981-1985)). All 10 randomly selected women consented to an interview. The interview was structured by a set of nine open-ended questions presented in sequence, however, only six questions were of relevance to this study and are listed in Appendix F. Information sought pertained to the type of social support experienced by each individual in vocational choice, personal and academic achievements perceived, and general satisfaction in a variety of life-role situations. It was estimated that 30 minutes would be sufficient to address the structured questions and any spontaneous responses. Telephone interviews were conducted between September - December, 1997.

The telephone interview format allowed for greater flexibility and accuracy of response than would be found in standard questionnaires. Subjects were able to seek clarification if they did not understand the question, and the interviewer was able to pursue incomplete or ambiguous responses. Finally, it should be noted that in an interview type of format, the interview attempts to understand the world from the participant's point of view, to unfold the meaning of the participant's experience, and to uncover their lived world prior to scientific explanations (Kvale, 1996).

The use of the interview format, however, also introduces the potential for interviewer bias. To guard against this possibility a number of precautions were taken. First, all interviews were carried out by the author. During the interview, women were asked the questions in a standardized fashion. The wording and order of questions was constant. Responses to the questions were, for the most part, open ended. Women were allowed to discuss or explain their answers in as much detail as they wished. If they did not appear to understand the

questions, then assistance would be provided; if their response was unclear or ambiguous, then clarification would be sought. Probes were used judiciously and care was taken not to give examples or provide information that might influence the women's subsequent responses. All responses to the interviews were taped and coded with the participant's subject number. In order to stay close to the data, all ten interviews were transcribed verbatim by the author, and then reviewed for accuracy.

Instrumentation

Rationale

Two measurement instruments were utilized to derive information to address the first two research questions. The two measurement instruments were the Values Scale and the Salience Inventory. The Values Scale provides a measure of work/non-work related values or satisfaction that most people seek in life, and the Salience Inventory provides a systematic way of establishing the relative importance of five major life roles. With respect to The Values Scale, several instruments have been developed from theories related to concepts such as values. These instruments range from scales concerned with the measurement of the value an individual places on such factors as personal development and self-actualization and which gives scores on one broad construct (Warr, Cook, & Wall, 1979; Gay, Weiss, Hendel, Dawis, & Lofquist, 1971; Pyror, 1981). Although these instruments have provided the basis for instrument development in other countries or have been adapted or translated into other languages, they lack in applicability for use in cross-cultural research (Fitzsimmons, Macnab & Casserly, 1985). The Values Scale is a national and international instrument which reflects the social changes

since the 1970s and allows for cross-cultural comparisons in reliable and valid ways.

Similar attempts have been made to assess work salience (Dubin, 1956; Greenhaus, 1973). In general, though, these scales and others like them have concentrated on a uni-dimensional definition of work importance and have largely ignored the other life roles, as well as yielding measures that were generally very broad in nature (Fitzsimmons, Macnab & Casserly, 1985). Unlike earlier instruments, and like the Values Scale, the Salience Inventory is a national/international instrument designed to measure the behavioural and affective components of five major life roles. Thus, the decision to use the current instruments was based upon: appropriateness of the questions to the examining variables, suitability of the questionnaires to the population, technical merits of the instruments, availability of the instruments, and a 45-minute time commitment for questionnaire completion.

The Values Scale

The Canadian version of the Values Scale (VS) was used to measure values (See Appendix C). The VS was developed as part of the Work Importance Study (1980), which is a major international project with the purposes of the development of a model for work and other life-role importance, and the formulation of measures for it (Super, 1982). Working groups from numerous countries developed, revised and piloted the definitions of the values list as well as the test items (See Appendix D for the items attached to the 20 values). The definitions were translated into the languages of the various national teams and consequently the VS is available in at least seven different languages. The purpose of the VS is to permit high school students, university students, and adults to better understand the values that they may uphold in

various life roles, and to assess the relevance of the work role within the presence of various other life roles (Luce, 1991).

The current version of the VS is a 100 item inventory consisting of 20 subscales, each of which measures a value or satisfaction that most people seek in life. Each subscale is represented by 5 items. The items are preceded by the stem "It is now or will be important for me to. . .". Completing the VS requires respondents to indicate how important the value is to them using a four-point Likert scale that ranges from 1 (little or no importance) to 4 (very important). A respondent's score on a subscale is the sum of her/his responses to the five items representing that subscale. The VS was normed on a Canadian sample of 10,000 adults (Macnab, Fitzsimmons, & Casserly, 1986). Internal consistency coefficients ranged from .68 for achievement to .91 for altruism with a median value of .83. Test-retest reliability coefficients ranged from .61 for personal development to .82 for physical activity with a median value of .70. Face and concurrent validity has also been established and are of acceptable levels (Macnab, Fitzsimmons & Casserly, 1986). Studies conducted using the VS (Macnab & Fitzsimmons, 1987; Madill, Fitzsimmons, Macnab, Stewin, Brintnell, & Casserly, 1986) indicate that, in general, the VS has good structural, reliability, and validity characteristics.

The Salience Inventory

The second instrument used was the Salience Inventory (SI) (See Appendix E), which was also constructed as part of the Work Importance Study (WIS) (See above for description of project). The SI is a 170-item objective assessment of various roles in which an individual perceives present and future involvement. Fifteen scales make up the SI. There are five role scales - Studying, Working, Community Service, Home and Family, and Leisure Activities - for each of three dimensions - Participation, Commitment, and Value

Expectations. Participation is viewed as the behavioral component of the importance of a role, and is measured by the amount of time given to a particular role. Commitment is viewed as the affective component of the importance of a role and provides information on the individual's attitude toward each of the five roles. Value Expectations is also an affective component, assessing the degree to which individuals find major life satisfactions or values in each role. Respondents' level of endorsement is rated on a four-point Likert scale similar to the one used for the Values Scale. Reliability data were derived from studies involving 6,382 English- and French-speaking adults collected across Canada (Fitzsimmons, Macnab, & Casserly, 1985). Coefficient alpha internal consistency reliabilities computed for the salience scales ranged from .85 to .98 for participation, .89 to .98 for commitment, and .87 to .90 for the role values. Test-retest reliability coefficients ranged from .59 to .83 for roles within the Participation scale, .60 to .77 for roles within the Commitment scale, and .37 to .67 for roles within the Values Expectations scale.

Data Analysis and Interpretation

Quantitative

The means and standard deviations for twenty work/non-work values were computed in order to determine if there were values that were rated higher and/or lower within each group. The means and standard deviations of five life-roles in the areas of participation, commitment, and role value were also computed in order to determine if there were life-roles that were rated higher and/or lower within each group.

Various multivariate analyses of variance (MANOVAs) were performed on the data to determine if there were significant differences between the two groups measured on twenty values and five life-roles in the areas of

participation, commitment and role value. The MANOVA provides an omnibus (overall) statistical test of whether or not the vector (set) of means for the two groups are equal while it controls the type-I error rate.

For all statistical tests, the level of significance was set at .05.

Qualitative

Responses to the interview questions (See Appendix F for list of interview questions) add descriptive documentation about possible influences on work/non-work values and salience of various life-roles in high-achieving women's academic/occupational-related choices and decision making. Social support systems, related achievements, and life satisfaction are presented from the perspective of the women; the way they see their situation and environment. Categories of typical patterns and circumstances that emerge from the interviews complement the empirical data. To quantify responses, a standardized format for examining and reducing the interview information was developed and implemented consistently throughout this stage of the study (Tesch, 1990). Tesch (1990) has outlined eight steps for analyzing textual data. First, all the responses for each interview question were read through. A summary list of descriptors or terms that were used in the responses were then compiled. From this list the responses were placed into a number of categories (usually 4). For each category created, a list of associated descriptors/terminology was kept. The data was summarized again, using the categories created, for both groups of women and for that section of questions. The list of descriptors and terms subsumed by a particular classification helped ensure that categorization of the responses was consistent. When a novel response was encountered, an attempt was made to include it in one of the existing categories - if not a new category was created. This process was repeated for all categories of questions.

CHAPTER VI

RESULTS AND DISCUSSION

Analysis of the questionnaires yielded information that discriminated between younger and older Shads in terms of their work/non-work related values, and life-role choices in participation, commitment, and role value. Analysis of data obtained through the in-depth telephone interviews provided information about women's experience from women's perspective. The general themes or categories that emerged are discussed and data from select questions is presented in the text to support and substantiate claims made.

Quantitative

Values

The means, standard deviations, F ratios, and probability levels for younger and older Shads for 20 work/non-work related values are presented in Table 3. Values rated highest by the younger Shads are achievement, personal development and social relations. The values rated highest by the older Shads are personal development, autonomy, and social relations. The lowest rated values by the young Shads are physical prowess, lifestyle and risk. The same values were also rated lowest by the older Shads. The younger Shads rated ability utilization, achievement, advancement, aesthetics, altruism, creativity, culture identity, lifestyle, personal development, physical activity, physical prowess, risk, social interaction, and social relations higher than the older Shads. The older Shads rated authority, autonomy, economic, prestige, and variety higher than younger Shads.

A series of multivariate analyses was performed on the data with 20 work/non-work values as the dependent variables. Multivariately, the mean vectors of the two groups was significantly different (Wilks' Lambda = 2.867; $F(20, 23) = 3.300$, $p < .001$). Univariately, there is a significant group difference on aesthetics ($F(1,42) = 24.251$, $p < .001$), altruism ($F(1,42) = 10.250$, $p < .001$), physical development ($F(1,42) = 4.290$, $p < .05$), social relations ($F(1,42) = 4.567$, $p < .05$) and culture identity ($F(1,42) = 4.504$, $p < .05$).

Values emerging in the areas of aesthetics, altruism, and social relations support the concept of relatedness in women's lives. Significant differences among the two groups were found on 5 of the 20 values on the Values Scale. Younger Shads scored significantly higher than did older Shads on aesthetics, altruism, physical activity, social relations, and culture identity. The results for younger Shads are similar to those reported by Yates (1990, cited in Niles & Goodnough, 1996) who found in his investigation of life stage differences that 18-25 year olds placed more emphasis on the values of social relations, and less emphasis than did the 26-35 year old group on the values of autonomy and working conditions.

Values are cognized representations of needs that, when developed, provide standards for behavior, orient people to desired end states, and form the basis for goal setting (Crace & Brown, 1995). Values are the major factor in motivation because they form the basis for attributing worth to situations and objects (Feather, 1992). Values also determine the way needs are met in the family, at work, and in the community (Crace & Brown, 1995). The significantly higher scores related to aesthetics, altruism and social relations by the younger Shads are in line with the literature for this age group. Valuing aesthetics and altruism coincide with having aspirations for careers that involve making the world more beautiful and helping people with their problems (Yates, 1990, cited

in Niles & Goodnough, 1996). The same can be said with their scores related to the value of social relations. That they scored significantly higher in the area of physical activity may reflect their interest in health and fitness and in keeping in good shape. Finally, the younger Shads in this study scored significantly higher than the older Shads on the value of cultural identity. This means that the younger women placed a great deal of emphasis on working with people with similar backgrounds and feeling accepted at work. This latter finding indicates the need for those in the school (and those in the workplace) to examine the degree to which their respective environments are, in fact, "culture friendly."

The six values rated highly by the older Shads included authority, autonomy, economic, prestige, variety, and working conditions are surprising in light of this study and are contradictory to social stereotypes. These results suggest that the older Shads are more career-oriented than the younger group. The high emphasis on career-related values by this group may indicate an interest in greater seniority in their occupational positions and, thus, more job security - something that is increasingly important during periods when job layoffs are increasing. These findings may also reflect a realistic acknowledgement of the value of a job or career in our current economic society. Another interesting finding is that no values emerged as significantly different for older Shads. As a result, and due to the small sample and number of variables used in this study, these findings should be viewed with caution.

Table 3 Means, standard deviations, F ratios, and probability levels for
younger and older Shads on 20 work/non-work related values

	Younger (N=21)		Older (N=23)		F	P
	Mean	S.D	Mean	S.D		
Ability utilization	3.43	.47	3.42	.44	.01	.935
Achievement	3.53	.37	3.46	.40	.39	.536
Advancement	2.94	.51	2.90	.73	.61	.807
Aesthetics	3.18	.55	2.28	.65	24.25	.000**
Altruism	3.46	.62	2.84	.67	10.25	.003**
Authority	2.96	.55	3.04	.46	2.85	.596
Autonomy	3.39	.44	3.54	.43	1.28	.263
Creativity	3.07	.81	2.88	.68	.70	.408
Culture identity	2.94	.73	2.50	.64	4.50	.040*
Economic	3.20	.60	3.22	.39	.01	.909
Lifestyle	2.05	.54	1.82	.54	2.05	.162
Personal development	3.67	.34	3.59	.35	.51	.478
Physical activity	3.13	.69	2.67	.78	4.29	.045*
Physical prowess	1.83	.68	1.52	.64	2.39	.130
Prestige	3.11	.62	3.24	.50	.51	.477
Risk	2.06	.63	1.88	.77	.69	.408
Social interaction	2.96	.52	2.76	.41	2.10	.154
Social relations	3.69	.40	3.48	.23	4.57	.038*
Variety	3.05	.50	3.12	.74	.15	.701
Working condition	2.82	.58	2.85	.54	.04	.845

multivariate df 20,23

univariate df 1,42

* $p \leq .05$; ** $p \leq .01$.

Life-roles

The means, standard deviations, F ratios, and probability levels for younger and older Shads for five life-roles in the areas of participation, commitment, and role value are presented in Table 4. In participation, younger Shads rated leisure activities the highest and community service the lowest. Older Shads rated working the highest and community service the lowest. In commitment, younger Shads rated home and family the highest and community service the lowest. Older Shads rated working the highest and studying the lowest. In role value, younger Shads rated working the highest and community service the lowest. Older Shads rated home and family the highest and studying the lowest.

A series of multivariate analyses (MANOVAs) was performed on the dependent variables studying, working, community service, home and family, and leisure activity in the areas of participation, commitment, and role values. Multivariately, the mean vectors of the two groups are significantly different for participation (Wilks' Lambda = .443; $F(5, 38) = 9.537$, $p < .001$). The mean vectors of the two groups are also significantly different for commitment (Wilks' Lambda = .552; $F(5, 38) = 6.153$, $p < .001$), and for role values (Wilks' Lambda = .481; $F(5, 38) = 8.194$, $p < .001$). Univariately, there is a significant group difference in participation for studying ($F(1,42) = 27.801$, $p < .001$) and for leisure activities ($F(1,42) = 9.267$, $p < .001$). There is a significant group difference in commitment for studying ($F(1,42) = 27.680$, $p < .001$) and for leisure activities ($F(1,42) = 7.492$, $p < .001$). There is also a significant group difference in role value for studying ($F(1,42) = 25.372$, $p < .001$) and for community service ($F(1,42) = 12.475$, $p = .001$).

Table 4 **Means, standard deviations, F ratios, and probability levels for**
younger and older Shads for life-roles in participation,
commitment, and role value

	Younger (N=21)		Older (N=23)			
	Mean	S.D	Mean	S.D	F	P
<hr/>						
<i>Participation</i>						
Multivariate F - Wilk's lambda					9.53	.001**
Studying	2.91	.50	1.90	.74	27.80	.000**
Working	2.55	.69	2.92	.43	4.49	.040*
Community service	2.07	.71	1.68	.67	3.45	.070
Home and family	2.54	.58	2.87	.69	2.97	.092
Leisure activities	3.01	.48	2.60	.40	9.27	.004**
	multivariate	df	5, 38	univariate	df	1, 42
<i>Commitment</i>						
Multivariate F - Wilk's lambda					6.15	.000**
Studying	3.34	.58	2.27	.76	27.68	.000**
Working	3.43	.72	3.65	.44	1.52	.224
Community service	2.23	.60	2.30	.68	.13	.716
Home and family	3.51	.40	3.49	.41	.02	.882
Leisure activities	3.15	.57	2.71	.50	7.49	.009**
	multivariate	df	5, 38	univariate	df	1, 42
<i>Role Value</i>						
Multivariate F - Wilk's lambda					8.19	.000**
Studying	2.87	.50	2.02	.60	25.37	.000**
Working	3.18	.39	3.02	.40	1.83	.184
Community service	2.73	.54	2.12	.59	12.48	.001**
Home and family	2.90	.69	3.10	.52	1.24	.273
Leisure activities	2.84	.55	2.70	.41	.95	.336
	multivariate	df	5, 38	univariate	df	1, 42

* $p \leq .05$; ** $p \leq .01$.

In a study of life-role importance with classroom teachers, Crozier (1990) found that married or cohabitating teachers rated the home and family role as being significantly more important than did single teachers. Single teachers rated work as being the most important life role, followed by leisure and homemaking. Crozier (1990) noted that "for individuals without children and for singles it appears that the home and family role is being replaced by work, and for singles, it is also replaced by the leisure role" (p. 237). Results of the present study are inconsistent with these findings. The younger (single) women in this study rated the home and family role as most important; the older (some married) rated the working role as most important followed by the home and family role. Many of the younger women in this study were full-time university students, and for some of them this may be a very stressful time. The fact that they report the home and family role as most important confirms their need for emotional relationships and the influences of a social support system in pursuit of a career choice. The fact that the older Shads reported the working role as more important along with the family role highlights the role of women in the workplace. For many women today, work is a necessity, and is just as important (if not more) than the once traditional family role. However, the results of this study are consistent with other studies supporting the fact that, although work is an important life role for adults in Canada, it is often not the central life role. Home and family, as well as leisure activities, provide important outlets for self-expression for many Canadians.

Another interesting finding in the present study are the young Shad's higher values expectations scores for work than the older Shads. This finding raises questions concerning the actual importance of women in the world-of-work versus the perceptions of female students relative to what the world-of-work will be like once it is encountered. For example, the higher values

expectations scores for home/family for the older women may reflect a realistic acceptance of the traditional division of labor. However, are the higher values expectations for the younger women for work a reflection of unrealistic expectations for the work experience? Or, are they a reflection of having few encounters with discriminatory practices in the workplace? If so, what difficulties will these women students experience as they make the transition from school to work? Obviously, to answer some of these questions future research is needed that focuses on issues such as the school-to-work transition experience for women.

Qualitative

The participants were asked nine questions. However, only six questions were used for analysis in the present study (See Appendix F), and will be discussed as they pertain to research questions 3 through 5. Four major categories were derived from the organization of the data, and together with the interview questions, are summarized and discussed below.

Interview Question #1: What are your three greatest achievements - As a student? As an adult?

The first question was two-part and asked participants to indicate their three greatest achievements, first as a student, and second as an adult. The first category of responses was labelled 'achievements', that is, accomplishments described by the women in their life roles as a student and as an adult. Distinguishing between student and adult accomplishments was easier for the older than the younger Shads. For this latter group, the lines were clearly difficult to separate. For example, the majority of the younger Shads listed or discussed student accomplishments when asked about greatest achievements in their adult development, thereby indicating that they believe student

experiences influenced their adult development. Accordingly, when asked to discuss their greatest achievements in their adult development, they often reiterated or expanded what had been listed as student achievements.

Regarding student accomplishments, the majority of the younger respondents listed either their educational accomplishments or the development of their own potential when asked about their greatest achievements as a student.

Representative comments from this group follow:

Maintaining high grades as well as becoming self-sufficient in the process. I had to put myself through school . . . I've been on my own for one year now so continuing to rely on myself financially has been very important to me; spending time with family and friends

- 21 year old, Marketing Research

My participation in the shad program and maintaining balance in various life-roles . . . also trying to stay diversified or exposed to as many different areas as possible

- 19 year old, Psychology major

The older Shads had no difficulty separating their student from their adult achievements but had more difficulty responding in the area of their adult achievements. Many had trouble coming up with a response or being able to perceive areas of their life where they felt they had achieved. One of the older Shads put it like this when she said,

I don't know that I've had any great accomplishments, I mean some of my greatest achievements right now are my children and my relationship with my husband but I don't know if that really counts.

Achievements as a student for older Shads included the completion of educational degrees, and maintaining involvement in student organizations as their greatest achievements. There were similarities between the two groups in that doing well academically (i.e., maintaining high grades), and winning

awards/scholarships for academic excellence, were areas of great achievement for them.

Achievements listed as an adult for the older Shads included their relationship(s) with their husband and/or children, recognition at work for hard efforts, feeling success in a career in that they were doing what they enjoyed, travelling overseas, and doing well athletically. The younger Shads listed achievements such as being able to maintain balance in their life, involvement in volunteer work, independence away from home, and obtaining their first job. The two groups of women were similar in that they both found great achievement in their relationships with family, friends, and/or people in general, and were proud of their continued involvement in other interests such as athletics or music.

The responses by both groups are typical with what has been found in the literature on women's achievement. While women who were married with children listed having children as achievements, they also listed as the other women, personal satisfaction and honors and awards received. One woman had achieved being President of the Medical Genetics Students' Union. Two women had written outstanding papers in their field that were published. One woman had received the Governor General's Award for distinction in her field of study. One woman had graduated the top of her class in Engineering. One woman had achieved a fellowship for study in cancer research. Similarly, all women found great achievement in their relationships at home and work, and in their hobbies/interests.

In general, many of the women in this study found their relationships at work and home, and being able to maintain balance in their various life-roles, areas of great achievement for them. Some women spoke with pride of their achievements in the academic and occupational realm. However, other women

were hesitant in the interviews as to whether the areas they listed (i.e., relationships with husband/children) counted for achievements. Many of the older women were very busy doing the majority of housework, and taking primary responsibility for raising their children. After working all day, many came home to a second job. Little time existed for creative pursuits, yet most managed to involve themselves in projects of which they were proud. Similarly, many of the younger Shads were pursuing full-time studies as well as maintaining involvement in leisure activities and/or community service work. When measured by male or societal standards, presenting a workshop at a local conference or volunteering at a local charity may seem to be a modest accomplishment. But when measured by female views of the dual importance of family and work, these are indeed accomplishments (Reis, 1995).

The majority of women in the present study defined their accomplishments in both traditional and relational terms. In addition to educational degrees attained and career advancement achieved, many of these high achieving women also included personal and/or interpersonal growth or accomplishments in their list of three greatest achievements. Similar to the diversity of definitions of success reported by Terman's (Terman & Oden, 1959) sample, very few women limited their self-defined achievements to traditional areas alone. Their responses indeed validate the need for an expanded definition of achievement, and highlight the importance of looking beyond measures such as eminence, occupation, the Supreme Court, number of patents, and the Senate. If success and achievement in gifted women is measured based upon giving of themselves for the good of society, using their talents to strengthen one's own value system, achieving greater and greater challenges, lack of contentment with the status quo, development of broader avenues of expression, having a personal mission to be a better person and to

make this a better world, then women have a more reasonable chance to be considered as actualizing their potential (Hall & Hansen, 1997). In addition, if society values service, and moral integrity, and offers more training, and rewards more men for achievements beyond the typical prestigious career ladder, it is possible that men will shift toward new ways of actualizing their potential. Resultant, society will benefit by the creative products, caring family structures, and more altruistic nature of the people (Hall & Hansen, 1997).

Interview Question #2: In retrospect, who do you regard as most influential in terms of your current life-role choices? (Please rank order)

Interview Question #3: In what way(s) have they influenced you?

The second question asked participants to rank order, from a list of four categories of individuals specifically named by the researcher, those individuals who were most influential in their current life-role choices. The third question asked participants to comment how these individuals had influenced their life-role choices. Together the responses to these two questions formed the third category which was labelled 'social influences', that is, individuals who have been prominent in the participant's life-role choices.

The most significant influence to emerge for both groups was parents. Parents were mentioned for being very instrumental in allowing freedom of choice to pursue occupational interests, offering support and encouragement in choices made, building self-confidence, and instilling a work ethic and a sense of social responsibility in the community. One woman, a younger Shad studying Psychology, summed it up like this,

I think I'm much more independent than my parents but I think a lot of it has to do with the way I was raised, because my mom stayed home with us a lot and you know, she started her career after we were all out of the house and free. But I was never brought up that way. I was always told,

you can go to university and you can be whatever you want. It wasn't just my mother saying that but my father too, telling me if I want to be an engineer, then go ahead be an engineer

Both groups of women indicated a strong sense of family nurturance and connectedness. Although the majority of women did not make a distinction between their mother or father, there were two cases in the older Shad group who mentioned their father as being a specific influence in their life-role choices. Both women mentioned taking an interest in their father's career at an early age and being supported by their father in their interests.

Most of these women valued the opinions of their parents, but a few of the older Shads also expressed concern that mothers "had little power." Some of the older Shads had fathers who were more dominant in the household and were a stronger role model than the mothers who were mostly homemakers. One woman who was working as an Engineer said, "My father and I have always been close . . . from an early age I recall being interested in what he did, he's always emphasized upward mobility and the importance of striving for excellence. . . my mother stayed at home and raised us kids . . . she was very happy doing this but I knew for myself that I always wanted to do more." Not all of the older Shads felt this way. One woman who was a Speech Pathologist held a different perception about her homemaker mother. "Growing up I was surrounded by some very powerful women in my life . . . my aunts are very strong-willed and my mother was very influential as an independently minded individual . . . she never had a career perse but she was a very strong woman who instilled in me some very positive values . . . I grew up knowing that women could do anything."

The younger Shads saw no distinction in the influence of their mother or father - many were raised in households where both parents worked and

contributed equally to childraising and household duties. These young women looked back on their family life and almost unanimously agreed that both parents had contributed positive values to their development. "My mother was an excellent role model for me. . . I saw how she worked full-time and then came home to her family . . seeing her example I knew that I would be able to combine my career with my family and be successful because she was," reported one Psychology major. "My father has always encouraged me in whatever interests I had . . he never ever treated me like a girl, I should have been born a boy because I always felt like the son he never had," said an engineer. The results of these familial interactions in younger (and older) Shads support previous research indicating the vital role that parents have in creating expectations of achievement in their female children (Raymond & Benbow, 1989). These results also support those of Leroux (1994) whereby daughters of working mothers appeared to feel empowered by mothers who were self-sufficient and who valued education for themselves and their children. When mothers were at home, there was sometimes an inverse relationship to the role modelling.

The second influence to emerge ranged from teachers for the older Shads to teachers, friend and/or partner for the younger Shads. Teachers were mentioned for a variety of reasons that included providing support and encouragement of interests, presenting material in interesting and challenging ways, displaying enthusiasm for learning which was contagious, setting high standards and expectations of work, and treating student as an equal. In some cases, specific teachers (Math, English, Music, or Science teacher) were cited for the interest these teachers took in them as students, and for being good role models in eventual choice of career.

Previous research has discussed the differential treatment by teachers with respect to mathematics/science. The results of this study provide mixed support with respect to these findings. Specific teachers, such as a math, music, english or physical education teacher, were mentioned positively for taking an interest in the female student and for treating the student like an equal. Specific teachers' positive influence was mostly mentioned by the younger Shads but a few of the older Shads also talked about the special influence of a specific teacher. However, not all of the older Shads reported a positive influence by teachers. Some of the older Shads expressed anger about the lack of support by teachers for their mathematics/science-related interests. "Feeling ignored in science classes and boys getting all the attention turned me off from science . . all the examples were geared towards males, I guess I just got bored," was how one Speech Pathologist put it. Another, a Social Worker, remarked, "I came back 'on a high' after participating in the Shad program, but I came back knowing more than my science teacher, than any of my teachers really . . . there were no teachers to model after and none of my teachers encouraged my math or science interests . . it was a real letdown."

Many of the older and younger women noted educators who were powerful influences (positive or negative) on their careers. The results from this study indicate that teachers' perceptions regarding younger high-achieving females may be changing. Male, and female teachers were mentioned, albeit moreso by the younger Shads, for their favorable attitudes towards encouraging the high achieving female to pursue traditional male courses such as science and higher mathematics and graduate work. This is a promising area and could indicate that contemporary teachers are starting to accept the potential of high achieving females for achievement or the changing role of women in society.

The older (and some of the younger) women discussed the importance of mentor-type relationships on their careers. Although many of the older Shads were not as positively influenced by educators in high school, many of them reported a positive influence by mentors down the road who had helped in the formation of their careers. For example, one older woman who had pursued graduate studies in Humanities, and another older woman who had pursued graduate studies in science research, spoke of university professors, and other graduate students who accepted their abilities and allowed them to risk voicing their ideas. "I used to be teased about being smart, but now I find others respect and admire me when I get something right, I'm also not afraid to speak out and say what's on my mind," said a Literature professor.

In addition to mentor relationships, younger and older Shads also mentioned other significant influences, particularly from husbands, boyfriends, and other individual men in the workplace who helped them forge new paths in their careers. As one said, "early in my career I had supervisors who had high expectations of me, demanded a lot from me. They made me challenge myself." Another commented, "A very prominent member in the research community took me under his wing and taught me the ropes . . he worked with me and supported my development." For women who were either married or involved in a relationship, a spouse and/or partner was mentioned as instrumental in providing support and encouragement in a career or pursuit of career, and being open-minded with respect to female roles in society. One woman, an engineer, spoke about the support of her husband like this:

My husband has been my biggest fan . . I make more money than he does but that doesn't bother him a bit. . . his total encouragement of my professional goals has been the secret of my success.

Friends were mentioned by both groups of women as being good role examples for choices to make or avoid, and for providing encouragement and support.

As previous studies have shown, the need for committed individuals who take a sincere and strengthening interest in the aspirations of gifted females was clearly portrayed in the responses of these older and younger high achieving women. Mentors provide role models, support, encouragement, and socialization into the profession (Kaufmann, Harrel, Milam, Woolverton, & Miller, 1986).

Interview Question #4: On a scale of 1-10 how satisfied are you in the following: family, career, friendship, richness of cultural life, joy in living, actualization of potential, physical development/well-being, adult life-role balance?

The fourth question asked participants to comment, using a rating scale from 1 (low) to 10 (high), on their satisfaction in a number of different areas named by the researcher. This category was labelled 'satisfaction.' A common characteristic of the majority of women in this study is that most were satisfied with the different aspects of their lives in general, however, younger Shads were more highly satisfied as a group than the older Shads. The younger Shads felt high satisfaction in all areas except for family, and actualization of potential, which were rated relatively lower. In family, some of the younger women in this study were still living at home and were frustrated by the fact that they could not really establish their independence because of this. Other women were living on their own and were frustrated by the lack of contact (on the family member's part) or the estrangement they felt by their family. With respect to realization of potential, many of the younger Shads felt they were

fulfilling their aspirations and goals but weren't quite sure if they were "realizing their potential" to the best of their abilities. It was interesting to note that some of these women stated it was "more important to be doing something they enjoyed" rather than trying to reach one's potential. Their responses might indicate an awareness of the importance of their values and a non-conforming attitude to societal expectations. On the other hand, these women are all fairly young (average age is 21 years old) and as previous research indicates, dissatisfaction with realization of potential might not come until later in life when there is a reflecting back on what could have been done.

Not surprisingly, the older Shads were satisfied in all areas except for adult life-role balance, actualization of potential, and physical development/well-being. All of these women expressed the difficulty of trying to balance family, career, and other life roles, and the lack of time for pursuing other interests. This finding supports that of other research suggesting that the greatest conflict for gifted women is centered around the interaction of career and personal life, which in turn, influences their satisfaction in life (Reis, 1995). In some cases, where a spouse and/or children were involved, there was neither the time nor the energy to pursue their own talents after working and taking care of their families. This issue left two of the women in this study quite frustrated about their lives. Carolyn Heilbrun, the author of *Writing a Woman's Life*, defines gifted as "not only talented but with a sense of great possibilities, great desires beyond the apparent possibility of fulfillment" (1988, pp. 97-98). This characterization described many of the experienced women involved in this study who were trying to create a life that somehow connected their talents, their responsibilities, their families, and their desires for fulfillment. The younger Shads experienced no dissatisfaction in adult life-role balance. Many of them expected to have-it-all someday and did not foresee a conflict between their

future work and family roles. It would be interesting to see, however, how their career expectations unfold over the next few years, and whether they are able to combine it all or if there is a shift towards less demanding careers as a result of involvement in future marriage and childraising roles.

The majority of the older high achieving women in this study were satisfied with their career although two of this group listed alternate careers they would retrospectively select. These women were unsure about their career choice, did not feel their talents were being utilized, and were contemplating a different choice of career. These women attributed this dissatisfaction with career choice to the lack of role models in nontraditional careers, and to the lack of guidance or encouragement by counsellors. We may speculate that the limited career choices available to the older women in this study when they entered college or pursued a career have certainly changed in the last decade or two. However, recent longitudinal research may indicate that this change has not occurred (Arnold, 1993).

Interview Question #5: In retrospect, what was the most exciting/important experience in your life? What factors account for this? (CIRCLE - peer support, hard work, high ability, family support, luck/choice, other)?

The fifth question was a two-part question. First, participants were asked to list their most exciting/important experience. Second, they were asked to indicate from a list of six factors named by the researcher, those which might account for the experience. This category was labelled 'experiences'. There were few differences between the two groups of women in the area of their most exciting experiences. Both groups mentioned the importance of their participation in the Shad program as well as travelling overseas as being some

of their most exciting/important experiences. Academic and occupational experiences (i.e., obtaining their degrees, landing a good job, winning in athletics) were also mentioned by both groups. Some of the older Shads also expressed marriage and having children as exciting experiences. In the attribution of factors accounting for these experiences, both groups of women were similar in reporting high ability, hard work, and/or peer/family support as the most common factors. The factors accounting for the exciting experiences mentioned by the women in this study do not support that of previous research.

Previous research in the area of attributions of success indicates that gifted females tend to attribute their successes to sources outside of their abilities, such as chance or luck (Leroux, 1994). None of the women in this study demonstrated this phenomenon. One woman (younger Shad) said she was "really excited" when she received a grade of 100 in one of her university classes, and was quick to point out that it was her "hard work and high ability" that enabled her to succeed. Similarly, another woman (older Shad) said her participation in Shad was due to "my high ability and peer support." Contrary to previous research, all of these women acknowledged their extraordinary abilities. With respect to exciting/important experience, both groups of women mentioned their participation in Shad and travelling overseas as being some of their most exciting or important experiences. However, the older Shads also listed other experiences such as obtaining their degrees, getting married and winning in athletic competitions. The most important factors accounting for these experiences mentioned by both groups of women included high ability, hard work and/or peer/family support. Unlike other research studies where women have been found to attribute their success to good luck (or external forces) (Colangelo, 1991; Leroux, 1991), not one woman in the present study mentioned luck or choice as an accountable factor in their experience.

Interview Question #6: In retrospect, what was the greatest regret/disappointment in your life? What factors account for this? (CIRCLE - difficulty level, bad luck, insufficient effort, family/peers, ability, other)?

The sixth and final question was also a two-part question. Like the question discussed above, participants were asked to list their greatest regret or disappointment. Second, they were asked to indicate from a list of six factors named by the researcher, those which might account for the experience. This category was also labelled 'experiences'. With respect to greatest regret/disappointment in life, both groups of women found this a very difficult question to answer. Younger and older Shads commonly perceived the term 'regret' as something negative, and as a consequence, had difficulty providing an answer. Many of the women would respond but then would just as quickly justify their response. For example, one woman (older Shad) regretted not giving more to a relationship when younger but added that it wasn't meant to be and she was happy doing what she was doing today. Another (younger Shad) regretted her lack of involvement in extracurricular activities in high school but that she was happily making up for the lost time through her current involvement in many and varied activities.

Regretful or disappointing experiences listed for the older Shads included not taking advantage of a good opportunity, and taking a certain job that wasn't liked. This group attributed their experience to factors such as difficulty of the situation or bad decision making. The younger Shads listed their greatest regret/disappointment as not being able to participate in the Shad program, and not being accepted for a scholarship or for a certain job. Factors accountable included bad luck and bad decision-making.

In the area of regretful or disappointing experiences, both groups of women had difficulty answering this question - many did not like to think of the regrets in their lives but instead would rather focus on the more positive aspects. Their responses to the question indicate the expressed optimism of this group to the decisions they've made and a belief that the best decisions have been made. Further, these responses do not support other research findings which show women to blame themselves for missed opportunities and, consequently to look back on their lives with regret. If any of these women had regret they were quick to perceive the positive consequences in the situation. The majority also did not blame themselves for these experiences but attributed them instead to bad luck and/or bad decision-making. In many cases, these women took responsibility for what happened, dealt with it and moved on. Their responses indicate a healthy sense of self-esteem. The women in this study may be learning to trust and believe in themselves and in their own personal judgments. This should be viewed as a good sign for our future generations of women.

CHAPTER VII

EDUCATIONAL/RESEARCH IMPLICATIONS AND STUDY LIMITATIONS

An attempt has been made in this investigation to explore the relationship between twenty work/non-work-related values to the salience of five life-roles in two different age groups of high achieving women in order to enhance our understanding of female career choices and decision making and their influence on career development. The perceptions of the high achieving women in this study have contributed to this understanding in a number of ways. These contributions are discussed in terms of research and theory on female career development in general and women's achievement in particular. Broad categories of multiple life roles and relational orientation are confirmed in participant's responses. Themes prevalent in the literature on women's achievement such as relatedness and multiple outlets for achievement desires are confirmed to varying degrees, yielding some insight into the variability and complexity of these women's lives. These findings are considered in terms of the contributions they make to the description and explanation of female's experience of themselves as successful. The realization of females potential will be addressed in a discussion of the implications of these findings for enhancing women's lives. Finally, limitations of this study and directions for ongoing inquiry arising out of this research will be discussed.

Educational Implications

Because of the strong differences between women and men in the area of realization of potential, traditional definitions of achievement may have a

strong impact on subsequent achievement (Hollinger & Fleming, 1992). The present study results emphasize the need for a new definition of adult life-role achievement as defined and corroborated by earlier authors, that will recognize the different value systems of women and men, and will recognize achievement in a range of roles and domains as both legitimate and worthwhile (Arnold, 1993; Gilligan, 1982; Hashizume & Crozier, 1994; Hollinger & Fleming, 1992; Kerr, 1994; Noble, 1989b, 1994).

All of the women in the present study felt a measure of success that was not just restricted to the work role. Women redefined their achievements in a way that allowed for their own value systems, and their multiple life roles. Their achievements included educational degrees and career status as well as providing service to and maintaining good relationships with others. Although many of these women were still in the process of realizing their potential and achieving their aspirations and goals, much of the career development literature would state that these women were underachieving. Their responses indeed validated the need for an expanded definition of achievement that includes not only educational, career, and financial accomplishments but also accomplishments that fall within other personal and interpersonal lifespaces.

One of the major outcomes of this study is the support that it gives to Eccles (1994) focus on the importance of subjective task value in making achievement-related choices, i.e., the importance of values, intrinsic interests, self-image and long term goals. Eccles maintains that men and women place different values on the same tasks, leading to gender differences in achievement-related tasks and in the allocation of time and energy. Participants in this study emphasized early emerging values and interests as their most important influence in occupational choice. Recognizing the role that values and interests have in career achievement is vital if women are to

advance equally with men. This finding is especially important for career counsellors who are working with young women.

Results verify other research that suggests interventions in the area of career counselling must be restructured to accommodate the different value systems of women and men, and the multiple life-roles of women. The work of Fleming and Hollinger (1994), Kerr (1985, 1994), Piirto (1994), and Walker, Reis and Leonard (1992) recognizes the need to address curriculum materials, activities, gender equality, and other practices that contribute to the present situation. Deliberate programs, policies, and courses of action that systematically address the issue are detailed for parents and practitioners.

The results indicated that the majority of women were involved in a diversity of life-roles and viewed achievement in each of these roles. Further, these women valued aspects of their career as much as they did working with people and for the betterment of society. Career theories that include a variety of life-roles over an individual's lifetime (Super, 1990) may find that women indeed are highly achieving. Recent other examples from the literature serve as testimony to the fact that the work role is only one area which women choose to operate and achieve success in (Hashizume & Crozier, 1994). As a result, any counselling work with women should include a discussion of options and a consideration of balance.

Some of the women in this study reported the lack of guidance and direction from counsellors with respect to academic/occupational choice. These women were frustrated because of the wrong career choice they felt they made as a result of this lack of guidance. Counsellors (and educators) need to encourage women to think about what is important to them and to realize that a possibility exists for combining what they value with a meaningful career. At the same time, they should also help women to realize that it may not be possible to

combine some professional careers with a happy marriage, the raising of children, and the care of a home and family. Women should be encouraged to explore how their abilities, talents, values and attributes can best be realized and in which life roles. In addition, women need to be encouraged in continuing with mathematics so that career options will not be prematurely and unnecessarily restricted. For example, attributes such as sensitivity and strong social values may be realized through a career in social work. However, they might be equally well realized through the role of mother or through weekend volunteering at a hospice while utilizing one's math ability and investigative interests in a career in engineering (Hollinger, 1991). Accordingly, interest should be supported in both nontraditional/traditional careers in order to allow women freer choice across the job spectrum.

Concerted efforts should be made to address an educator's own attitudes about sex roles and their impact upon female achievement. The relationship between math and science avoidance and sex-role stereotyping is exemplified in the career development of bright young females. Career development begins at an early age, and as previously discussed under the heading "external barriers," socialization and educational processes can either strengthen or weaken stereotypes, depending on the attitudes and actions of individuals involved with females. Counsellors need to be aware of the gender bias and stereotyping still prevalent in interest inventories and aptitude achievement tests which perpetuate stereotyped roles and limited options for women (Callahan, 1989). Similarly, teachers need to evaluate their own classrooms in terms of gender equity and strive to ensure that gifted females are active participants in, rather than passive observers of, the learning process. If counsellors/educators begin to acknowledge the connectedness females seek, reinforce the social skills females display, and encourage more risk taking, then

there may be less need for women to fight the conformity and the traditional stereotyping that plagues them (Leroux, 1994).

An advocacy role is critical to change the structure of work and the underlying values which exclude women from experiencing a sense of achievement. Gilbert (1985) recognizes that there is a place for career counsellors, especially, to be advocates to change some of the existing structures of education and work which do not allow for an alternative definition of achievement to be viable. Recent research documents that school counsellors continue to reflect attitudes and sex-stereotypes that are detrimental to the expression of the abilities and talents of bright girls (Noble, 1987). Therefore, counsellors may need to be retrained to understand that it is desirable to encourage girls interested and able in mathematics or science to pursue courses in these areas, to support girls' enrollment in Advanced Placement and discipline-specific accelerated programs, to advise girls of opportunities in all areas of industry and the professions, to aid gifted females in pursuing excellence. The value of this approach by counsellors can then be shared with parents who put ceilings on their daughter's achievements.

Re-education of society must begin in the areas where the impact can be most prompt and effective. School counsellors play a pivotal role in either encouraging or discouraging development of gifted females. The challenge for all of society, and particularly for counsellors, is to present an environment that is supportive of women and girls, allowing them to develop to their own full potential as equally valued and contributing members of society.

Study Limitations and Research Implications

This study's findings are not intended to promote the needs and experiences of high achieving women as universal (Kaschak, 1992) but to

make visible the varying experiences and perspectives currently unavailable in gifted research. Nor are the findings intended to serve as generalizations to all women identified as high achieving or gifted. The purpose is to complement the existing literature as well as to extend the knowledge of the experience of high achieving women who had an affiliation with the Shad Valley program. This study may assist women who are equally gifted and talented but who doubt their abilities or are restrained by societal stereotypes.

The limitations of this study are in reference to the size of sample and population. The sample was chosen from a larger sample of female participants and their non-participating cohorts of the Shad Valley program. The women are by virtue of either participating or applying to the Shad program, different from the average population in their high abilities. Traditional and non-traditional measures are used to select potential candidates for participating in the Shad program. Although high achievement is one of the major criteria for participation in most Canadian programs for the gifted, the extent to which this sample is representative of the larger population of high achieving females is unknown. Therefore, future research should focus on replication of the study with other high achieving females to maximize the interpretive value of research results. Further, it is important to note that this examination has been a "within gender high-achiever" study. Parallel research conducted with comparable samples of high achieving men is essential, as is research focusing on the differences between high achieving women and the population of women in general.

Of the 73 women who were contacted to participate in the study, only 44 women actually completed the questionnaires, with a further 10 of these women also participating in the telephone interviews. This figure corresponds to a 60% small sample dictates caution when generalizing the research results. This

response rate. However, the number of variables used in this study with such a small sample dictates caution when generalizing the research results. This study was strictly an exploratory study investigating work/non-work values, diversity of life-roles, and life satisfaction in high-achieving women. Therefore, future investigations should attempt to address the same research questions based on a larger, more representative sample.

Another possible limitation of this study arises from a phenomenon known as reactive measurement. For a variety of reasons, participants may have reacted or responded differently than they normally would have simply because they were aware their responses were being recorded (Shaughnessy & Zechmeister, 1990). In addition, there are the constraints indicated by the wording of the research questions. For example, the question "what are your three greatest achievements as a student?" may have unintentionally limited their responses to 'school' experiences. The participants may have explored other topics if the question was worded differently, such as "what are your three greatest achievements?".

This research is confined to an exploration of personal values and life-roles that are believed to be influential in women's achievement and the fulfillment of their potential. The findings of this study support other research which finds women to have different values than men and to operate in multiple life-roles. However, the reasons underlying these variables are less understood. Further, although some of the women in this sample have achieved their aspirations the issue of unfulfilled aspirations needs careful examination. Averaging between 18-33 years of age, many of these women are still very much in the process of realizing their potential and achieving their aspirations. Thus, it would be premature to label these women as having unrealized potential.

A promising area for further research is the examination of values and life-role choices across the life span of women. Particular attention should be paid to how these factors impact the career/life development process. It is clear that, for both groups of women, values and diversity of life-roles were important factors upon which academic/occupational choices were based. Further exploration of those influences should be conducted in order to provide information useful in designing intervention techniques. More research should be conducted with these women as they continue to evolve over the next 5 to 10 years. Examining and assimilating the changes that affect their lives will enhance our understanding of the achievement process and the realization of potential in the career development of high achieving women.

REFERENCES

- Armstrong, P., & Armstrong, H. (1981). The double ghetto: Canadian women and their segregated work. Toronto: McClelland and Stewart.
- Arnold, K. (1979). A national assessment of achievement and participation of women in mathematics. Denver: Education Commission of the States (ERIC Document Reproduction Service No. ED187656).
- Arnold, K. (1993). Academically talented women in the 1980s: The Illinois Valedictorian Project. In K. D. Hulbert & D.T. Schuster (Eds.), Women's lives through time: Educated women in the twentieth century, (pp. 393-414). San Francisco: Jossey-Bass.
- Arnold, K., & Denny, T. (1985). The lives of academic achievers: The career aspirations of male and female high school valedictorians and salutatorians. Paper presented at the annual meeting of the American Educational Research Association, Chicago, Illinois.
- Arnold, K., Noble, K. D., & Subotnik, R. F. (1996). Remarkable women: Perspectives on female talent development. New Jersey: Hampton Press Inc.
- Astin, H. (1985). The meaning of work in women's lives: A socio-psychological model of career choice and work behavior. The Counseling Psychologist, 12, 117-126.
- Baruch, G. K., & Barnett, R. C. (1986). Role quality, multiple role involvement, and psychological well-being in midlife women. Journal of Personality and Social Psychology, 51, 578-585.
- Belenky, M. F., Clinchy, B. V., Goldberger, N.R., & Tarule, J. M. (1986). Women's ways of knowing: The development of self, voice and mind. New York: Basic Books.
- Bellamy, L., & Guppy, N. (1991). Opportunities and obstacles for women in Canadian higher education. In J. Gaskell and A. McLaren (2nd ed.), Women and Education (pp. 163-193). Alberta: Detselig Enterprises.

- Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. Psychological Review, 88, 354-364.
- Betz, N. E., & Fitzgerald, L. F. (1987). The career psychology of women. Orlando, Florida: Academic Press.
- Blair, V., & Lupart, J. L. (1996). A study of female persistence and withdrawal from university mathematics programs. Exceptionality Education Canada, 6(2), 51-73.
- Boyd, C. O. (1993). Phenomenology: The method. In P. L. Munhall & C. O. Boyd (Eds.), Nursing research: A qualitative perspective. (pp. 99-132). Norwalk, Conn: Appleton Century Crofts.
- Callahan, C. M., Cunningham, C. M., & Plucker, J. A. (1994). Foundations for the future: The socio-emotional development of gifted, adolescent women. Roeper Review, 17, 99-105.
- Canadian Almanac & Directory (1998). Average earnings of men & women in Canada. Statistics Canada Catalogue 13-217-XPB.
- Card, J. J., Steele, L., & Abeles, R. P. (1980). Sex differences in realization of potential for achievement. Journal of Vocational Behavior, 17, 1-20.
- Carmen, E. H., Russo, N. F., & Miller, J. B. (1984). Inequality and women's mental health: An overview. In P. P. Rieker & E. H. Carmen (Eds.), The gender gap in psychotherapy: Social realities and psychological processes. New York: Plenum Press.
- Chipman, S., & Wilson, D. (1985). Understanding mathematics course enrollment and mathematics achievement: A synthesis of the research. In S. Chipman, L. Brush, & D. Wilson (Eds.), Women and mathematics: Balancing the equation (pp. 275-328). Hillsdale, NJ: Erlbaum.
- Clance, P. R. & Imes, S. A. (1978). The imposter phenomenon in high achieving women: Dynamics and therapeutic intervention. Psychotherapy: Theory, Research, and Practice, 15, 241-247.

Clutterbuck, D., & Devine, M. (1987). Having a mentor: A help or a hindrance? In D. Clutterbuck and M. Devine (Eds.), Business-women: Present and Future. Basingstoke: Macmillan.

Colangelo, N. (1991). Psychological development of gifted students. Exceptionality Education Canada, 1, 103-117.

Condry, J., & Dyer, S. (1976). Fear of success: Attribution of causes to the victim. Journal of Social Issues, 32, 63-83.

Cooley, D., Chauvin, C., & Karnes, F. (1984). Gifted females: A comparison of attitudes by male and female teachers. Roeper Review, 6, 164-167.

Crace, R. K., & Brown, D. (1995). Life Values Inventory. Minneapolis, MN: National Computer Systems.

Crozier, S. (1990). Life roles of Canadian teachers: The importance of work. International Journal for the Advancement of Counselling, 13, 227-239.

Daniels, P. (1985). Dream and drift in women's careers: The question of generativity. In J. H. Williams (Ed.), Psychology of women (pp. 425-436). New York: W.W. Norton & Co.

Denmark, F. (1993). Women, leadership and empowerment. Psychology of Women Quarterly, 17, 343-356.

Diamond, E. E. (1987). Theories of career development and the reality of women at work. In B. A. Gutek & L. Larwood. Women's career development (pp. 15-27). London: SAGE Publications.

Dowling, C. (1981). The Cinderella Complex. New York: Summit Books.

Dubin, R. (1956). Industrial workers' worlds: A study of the central interests of industrial workers. Social Problems, 3, 131-142.

Dweck, C., & Licht, B. G. (1980). Learned helplessness and intellectual achievement. In J. Garber, & M. E. P. Seligman (Eds.), Human Helplessness (pp. 197-221). New York: Academic Press.

- Eccles, J. S. (1985). Why doesn't Jane run? Sex differences in educational and occupational patterns. In F. D. Horowitz & M. O'Brien (Eds.), The gifted and talented: Developmental perspectives. (pp.151-195). Washington, D.C.: American Psychological Association.
- Eccles, J. S. (1986a). Social forces shape math attitudes and performance. Signs, 11, 367-380.
- Eccles, J. S. (1986b). Gender roles and women's achievement. Educational Researcher, 15, 15-19.
- Eccles, J. S. (1987). Gender roles and women's achievement-related decisions. Psychology of Women Quarterly, 11, 135-171.
- Eccles, J. S. (1994). Understanding women's educational and occupational choices: Applying the Eccles et al. model of achievement-related choices. Psychology of Women Quarterly, 18, 585-609.
- Eccles, J. S., & Blumfield, P. (1985). Classroom experiences and student gender: Are there differences and do they matter? In L. C. Wilkinson, & C. B. Marret (Eds.), Gender influences in classroom interaction (pp. 79-114). Orlando, FL: Academic Press.
- Eccles, J. S., & Harold, R. (1992). Understanding women's educational and occupational choices: Applying the Eccles et al. model of achievement-related choices. Psychology of Women Quarterly, 18, 585-609.
- Eccles, J. S., & Hoffman, L. W. (1984). Sex roles, socialization, and occupational behavior. In H. W. Stevenson & A. E. Siegel (Eds.), Child Development Research and Social Policy, Volume 1. Chicago: University of Chicago Press.
- Eccles, J. S., & Jacobs, J. (1986). Social forces shape math attitudes and performance. Journal of Women in Culture and Society, 11, 367-380.
- Eccles, J. S., Jozefowicz, D. M., Barber, B. L., & Belansky, E. (1993). Understanding females' occupational and educational choices. Paper presented at the Annual Meeting of the American Psychologist Association. Toronto, Canada, August 20.

- Epstein, C. (1970). Encountering the male establishment: Sex status limits on women's careers in professions. American Journal of Sociology, 75, 965-982.
- Epstein, C. (1988). Deceptive distinctions: Sex, gender, and the social order. New Haven, CT: Yale University Press.
- Erb, T. O. (1983). Career preferences of early adolescents: Age and sex differences. Journal of Early Adolescence, 3, 349-359.
- Feather, N. T. (1992). Values, valences, expectations, and actions. Journal of Social Issues, 48, 109-124.
- Fennema, E., & Sherman, J. (1977). Sex-related differences in mathematics achievement, spatial visualization and affective factors. American Educational Research Journal, 14, 51-71.
- Fitzsimmons, G. W., Macnab, D., & Casserly, M. C. (1985). Life Roles Inventory technical manual. Edmonton, Canada: PsiCan Consulting.
- Fleming, E., & Hollinger, C. (1994). Project CHOICE: A longitudinal study of the career development of gifted and talented young women. In R. F. Subotnik and K. D. Arnold (Eds.), Beyond Terman: Contemporary longitudinal studies of giftedness and talent (pp. 316-348), Norwood, NJ: Ablex.
- Fox, M. F. (1987). Women in the labor force: Position, plight, prospects. In J. Figueira-McDonough & R. Sarri (Eds.), The Trapped Women: Catch 22 in Deviance and Control (pp. 197-215). Newbury Park: Sage.
- Fox, L. H., & Turner, L. D. (1981). Gifted and creative females in the middle school years. American Middle School Education, 4(1), 17-23.
- Friedan, B. (1981). The second stage. New York: Summit Books.
- Froggatt, M. S., & Hunter, L. (1980). Pricetag: Canadian women and the stress of success. Ontario: Nelson Canada.

- Galloway, P. (1980). What's wrong with high school English? . . . It's sexist. . . unCanadian. . . outdated. Toronto, ON: OISE Press.
- Gaskell, J., & McLaren, A. (1991). Women and education (2nd edition). Calgary, AB: Detselig Enterprises Ltd.
- Gay, E., Weiss, D., Hendel, D., Dawis, R., & Lofquist, L. (1971). Manual for the Minnesota Importance questionnaire. Minnesota Studies in Vocational Rehabilitation, XXVIII.
- Gerson, K. (1986). Hard choices: How women decide about work, career, and motherhood. Berkeley: University of California Press.
- Ghulam, N. Z. (1993). Women in the workplace. Statistics Canada Document No: 71-534E.
- Gilbert, L. (1985). Comments on the meaning of work in women's lives. The Counselling Psychologist, 27, 129-130.
- Gilligan, C. (1979). Women's place in man's life cycle. Harvard Educational Review, 49, 431-446.
- Gilligan, C. (1982). In a different voice. Cambridge: Harvard University.
- Gilligan, C. (1988). Remapping the moral domain: New images of self in relationship. In C. Gilligan, J. V. Ward & J. M. Taylor (Eds.), Mapping the moral domain. Cambridge, MA: Harvard University Press.
- Gilligan, C. (1990). Teaching Shakespeare's sister: Notes from the underground of female adolescence. In C. Gilligan, N. P. Lyons, & T. J. Hanmer (Eds.), Making connections (pp. 6-29). Cambridge, MA: Harvard University Press.
- Ginzberg, E. (1966). Lifestyles of educated women. New York: Columbia University Press.

- Ginzberg, E., Ginsburg, S. W., Axelrad, S., & Herma, J. L. (1951). Occupational choice: An approach to a general theory. New York: Columbia University Press.
- Gordon, L. (1988). Heroes of their own lives. New York: Viking.
- Greenhaus, J. (1973). Factorial investigation of career salience. Journal of Vocational Behavior, 3, 95-98.
- Grimm, J., & Stern, R. N. (1974). Sex roles and the internal labor market structures: The "female" semi-professions. Social Problems, 21, 690-705.
- Grogan, M. (1996). Voices of women aspiring to the superintendency. New York: State University of New York Press.
- Guppy, N. (1989). Pay equity in Canadian universities, 1972-73 and 1985-86. Canadian Review of Sociology and Anthropology, 26(5), 743-758.
- Gutek, B. A., & Larwood, L. (1987). Women's career development. California: Sage Publications.
- Hall, E. G., & Hansen, J. (1997). Self-actualizing men and women - A comparison study. Roeper Review, 20, 22- 27.
- Hamilton, J., Alagna, S., King, L., & Lloyd, C. (1987). The emotional consequences of gender-based abuse in the workplace: New counseling programs for sex discrimination. Women & Therapy, 6, 155-182.
- Hashizume, L., & Crozier, S. D. (1994). A female definition of career achievement. In J. Gallivan, S. D. Crozier & V. M. Lalande (Eds.), Women, girls & achievement (pp. 106-120). North York: Captus University Publications.
- Heilbrun, C. G. (1988). Writing a woman's life. New York: W. W. Norton & Co.

- Helson, N., & Picano, J. (1990). Is the traditional role bad for women? Journal of Personality and Social Psychology, 59, 311-320.
- Hoffman, L. (1974). Early childhood experience and women's achievement motives. Journal of Social Issues, 28(2), 129-155.
- Holland, J. L. (1973). Making vocational choices: A theory of careers. New Jersey: Prentice-Hall.
- Holland, D. C., & Eisenhart, M. A. (1990). Educated in romance: Women, achievement, and the college culture. Chicago: University of Chicago.
- Hollinger, C. L. (1986). Career aspirations as a function of Holland personality type among mathematically talented female adolescents. Journal for the Education of the Gifted, 9, 133-45.
- Hollinger, C. L. (1991). Facilitating the career development of gifted young women. Roeper Review, 13(3), 135-139.
- Hollinger, C. L., & Fleming, E. S. (1984). Internal barriers to the realization of potential among gifted and talented female adolescents. Gifted Child Quarterly, 28, 135-139.
- Hollinger, C. L., & Fleming, E. S. (1988). Gifted and talented young women: Antecedents and correlates of life satisfaction. Gifted Child Quarterly, 32, 254-259.
- Hollinger, C. L., & Fleming, E. S. (1992). A longitudinal examination of life choices of gifted and talented young women. Gifted Child Quarterly, 36, 207-212.
- Horner, M. S. (1972). Toward an understanding of achievement-related conflicts in women. Journal of Social Issues, 28, 157-175.
- Hyde, J. S., Fennema, E., & Lamon, S. J. (1990a). Gender differences in mathematics performance: A meta-analysis. Psychological Bulletin, 107, 139-155.

- Hyde, J. S., Fennema, E., Ryan, E., Frost, L., & Hopp, C. (1990b). Gender comparisons of mathematics attitudes and affect. Psychology of Women Quarterly, 14, 299-324.
- Ilgen, D., & Youtz, M. (1986). Factors affecting the evaluation and development of minorities in organizations. In K. Rowland and G. Ferris (Eds.), Research in Personnel and Human Resource Management. Greenwich, Conn.: JAI Press.
- Jacklin, (1989). Female and male: Issues of gender. American Psychologist, 44, 127-133.
- Jensen, E., & Hovey, S. (1982). Bridging the gap from high school to college for talented females. Peabody Journal of Education, 59, 153-159.
- Josselson, R. (1987). Finding herself: Pathways to identity development in women. San Francisco: Jossey-Bass.
- Kaschak, E. (1992). Engendered lives: A new psychology of women's experience. New York: Basic Books.
- Kaufmann, F. A., Harrel, G., Milam, C. P., Woolverton, N., & Miller, J. (1986). The nature, role and influence of mentors in the lives of gifted adults. Journal of Counselling and Development, 64, 576-578.
- Kerr, B. A. (1985). Smart girls, gifted women: Special guidance concerns. Roeper Review, 8, 30-31.
- Kerr, B. A. (1994). Smart girls two: A new psychology of girls, women and giftedness. Dayton: Ohio Psychology Press.
- Kramer, L. R. (1991). The social construction of ability perception: An ethnographic study of gifted adolescent girls. Journal of Early Adolescence, 11, 340-362.
- Kutner, N., & Brogan, D. (1980). The decision to enter medicine: Motivation, social support, and discouragement for women. Psychology of Women Quarterly, 5, 321-340.

- Kvale, S. (1996). InterViews: An introduction to qualitative research interviewing. Thousand Oaks: Sage Publications.
- LaCroix, A. Z., & Haynes, S. G. (1987). Gender differences in the health effects of workplace roles. In R. C. Barnett, L. Biener, & G. K. Baruch (Eds.), Gender and stress, (pp. 96-121). New York: The Free Press.
- Leroux, J. (1991). On reaching my ideal self: A follow-up study of gifted females. Exceptionality Education Canada, 1, 83-93.
- Leroux, J. (1994). A tapestry of values: Gifted women speak out. Gifted Education International, 9, 167-171.
- Leslie, L. A. (1986). The impact of adolescent females' assessments of parenthood and employment on plans for the future. Journal of Youth and Adolescence, 15, 29-50.
- Linzer-Schwartz, L. (1980). Advocacy for the neglected gifted: Females. Gifted Child Quarterly, 24, 113-117.
- Lips, H. M. (1993). Sex & Gender: An introduction. California: Mayfield Publishing.
- Lips, H. M., & Temple, L. (1990). Majoring in computer science: Causal model for women and men. Research in Higher Education, 31, 99-113.
- Luce, T. (1991). The values scale (research edition). In D. Keyser and R. Sweetland (Eds.), Test Critiques VIII. (pp. 734-740). Texas: Pro-ed.
- Lupart, J. L., & Barva, C. J. (1998). Why do our "bright light" girls become a "faint glimmer" as adults? Paper presented at The Second Bi-Annual Canadian Association for the Study of Women and Education (CASWE) International Institute Proceedings. University of Ottawa, Ottawa, Canada.
- Lupart, J. L., & Barva, C. J. (In press). Promoting female achievement in the sciences: Research & implications. International Journal for the Advancement of Counselling.

- Macnab, D., & Fitzsimmons, G. W. (1987). A multitrait-multimethod study of work-related needs, values, and preferences. Journal of Vocational Behavior, 30, 1-15.
- Macnab, D., Fitzsimmons, G. W., & Casserly, C. (1986). Administrator's Manual for the Life Roles Inventory. Edmonton: PsiCan Consulting Ltd.
- Madill, H. M., Fitzsimmons, G. W., Macnab, D., Stewin, L. L., Brintnell, E. S. G., & Casserly, M. C. (1986). Work related issues in occupational therapy: Your values do count. Canadian Journal of Occupational Therapy, 53, 13-19.
- Marshall, K. (1989). Women in professional occupations: Progress in the 1980s. Canadian Social Trends, 12, 13-16.
- Martin, J. R. (1985). Excluding women from the educational realm. In S. L. Rich & A. Phillips (Eds.), Women's experience and education (pp. 158-174). Cambridge: Harvard Educational Review.
- Matlin, M. W. (1987). The psychology of women. New York: Holt, Rinehart & Winston.
- Meece, J., Parsons, J., Kaczala, C., Goff, S., & Futterman, R. (1983). Sex differences in math achievement: Toward a model of academic choice. Psychological Bulletin, 91, 324-348.
- Mill, H. T. (1983). Enfranchisement of women. London: Virago Books.
- Miller, J. B. (1986). Toward a new psychology of women (2nd edition). Boston: Beacon Press.
- Nevill, D. D., & Schlecker, D. L. (1988). The relation of self-efficacy and assertiveness to willingness to engage in traditional/non-traditional career activities. Women & Therapy, 12, 91-98.
- Nieva, V. F., & Gutek, B. A. (1981). Women and work: A psychological perspective. New York: Praeger.

- Niles, S. G., & Goodnough, G. E. (1996). Life-role salience and values: A review of recent research. Career Development Quarterly, 45(1), 65-86.
- Noble, K. D. (1987). The dilemma of the gifted woman. Psychology of Women Quarterly, 11, 367-378.
- Noble, K. D. (1989b). Living out the promise of high potential: Perceptions of 100 gifted women. Advanced Development Journal, 1, 57-75.
- Noble, K. D. (1994). The sound of a silver horn: Reclaiming the heroism in contemporary women's lives. New York: Fawcett Columbine.
- Normand, J. (1995, Winter). Education of women in Canada. Canadian Social Trends, 17-21.
- Northcutt, C. A. (1991). Successful career women: Their professional and personal characteristics. New York: Greenwood Press.
- Olshen, S., & Matthews, D. (1987). The disappearance of giftedness in girls: An intervention strategy. Roeper Review, 9, 251-254.
- Osipow, S. H. (1983). Theories of career development. New Jersey: Prentice-Hall.
- Ostling, R. N. (1992, February). Is school unfair to girls? Time, p. 49.
- Paludi, M., & Fankell-Hauser, J. (1986). An idiographic approach to the study of women's achievement strivings. Psychology of Women Quarterly, 10, 89-100.
- Parsons, F. (1909). Choosing a vocation. Boston: Houghton Mifflin.
- Pedro, J., Wolleat, P., Fennema, E., & Becker, A. (1981). Election of high school mathematics by females and males: Attributions and attitudes. American Educational Research Journal, 18, 207-218.

- Perun, P. J., & Beilby, D. D. V. (1981). Towards a model of female occupational behaviour: A human development approach. Psychology of Women Quarterly, 6, 234-252.
- Piirto, J. (1994). Talented children and adults: Their development and education. New York: Merrill.
- Pryor, R. G. L. (1981). Tracing the development of the work aspect preference scale. Australian Psychologist, 16, 241-257.
- Raymond, C. L., & Benbow, C. P. (1989). Educational encouragement by parents: Its relationship to precocity and gender. Gifted Child Quarterly, 33, 144-151.
- Reis, S. M. (1987). We can't change what we don't recognize: Understanding the special needs of gifted females. Gifted Child Quarterly, 24, 83-89.
- Reis, S. M. (1991). The need for clarification in research designed to examine gender differences in achievement and accomplishment. Roeper Review, 13(4), 193-197.
- Reis, S. M. (1995). Talent ignored, talent diverted: The cultural context underlying giftedness in females. Gifted Child Quarterly, 39, 162-170.
- Reis, S. M., & Callahan, C. M. (1989). Gifted females: They've come a long way - or have they? Journal for the Education of the Gifted, 12, 99-117.
- Richardson, M. S. (1979). Toward an expanded view of careers. The Counseling Psychologist, 8, 34-35.
- Riley, S., & Wrench, D. (1985). Mentoring among women lawyers. Journal of Applied Social Psychology, 15, 374-386.
- Rose, S., & Larwood, L. (1988). Women's careers: Pathways and pitfalls. New York: Praeger Publications.
- Sadker, M., & D. (1985). Sexism in the classroom of the 80s. Psychology Today, 19(3), 54-57.

- Sadker, M., & D. (1986). Sexism in the classroom: From grade school to graduate school. Phi Delta Kappan, 68, 512.
- Sadker, M., & D. (1994). Failing at fairness: How america's schools cheat girls. New York: Scribners Sons.
- Sandler, B. (1982). Project on the education and status of women. Washington, D. C.: US Government Printing Office.
- Schaef, A. W. (1981). Women's reality. Minneapolis, MN: Winston Press Inc.
- Scherr, M. (1986, April). Women as outsiders within organizations. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Schlosser, G. (1995). Gifted girls: Promise to prominence. Paper presented at SAGE - Conference.
- Sells, L. W. (1980). The mathematics filter and the education of women and minorities. In L. Fox, L. Brody, & D. Tobin (Eds.), Women and the mathematical mystique (pp. 66-75). Baltimore: The John Hopkins University Press.
- Shakeshaft, C. (1986). A gender at risk. Phi Delta Kappan, 67, 499-503.
- Shakeshaft, C. (1989). Women in educational administration. Newbury Park, CA: Corwin Press.
- Shapiro, G., & Farrow, D. (1988). Mentors and others in career development. In S. Rose & L. Larwood (Eds.), Women's careers: Pathways and pitfalls (pp. 67-85) New York: Praeger Publishers.
- Shaughnessy, J. J., & Zechmeister, E. B. (1990). Research methods in psychology (2nd edition). New York: McGraw-Hill Publishing Company.
- Sheriff, B., & Svenne, J. P. (1993, Winter). Are women excluded from careers in science? Women's Education, 7-10.

- Silverman, L. K. (1986). What happens to the gifted girl? In C. June Maker (Ed.), Critical issues in gifted education: Defensible programs for the gifted (pp. 43-89). Rockville, MD: Aspen.
- Silverman, E., & Holmes, J. (1992). We're here, listen to us: A survey of young women in Canada. Ottawa, ON: The Canadian Advisory Council on the Status of Women.
- Spalter-Roth, R., & Hartmann, H. (1990). Raises and recognition: Secretaries, clerical workers and the union wage premium. Washington, DC: Institute for Women's Policy Research.
- Statistics Canada. (1995). Distribution of employment, by occupation, 1982 and 1994. Labour Force Survey. (Catalogue No. 89-503E).
- Sternberg, R. (1985). Beyond IQ: A triarchic theory of human intelligence. New York: Viking.
- Sternberg, R. (1988b). A three-facet model of creativity. In R. J. Sternberg (Ed.), The nature of creativity: Contemporary psychological perspectives (pp. 125-147). New York: Cambridge University Press.
- Sternberg, R. (1991). Giftedness according the triarchic theory of human intelligence. In N. Colangelo & G. Davis (Eds.), Handbook of gifted education (pp. 45-54). Boston: Allyn & Bacon.
- Subotnik, R. F. (1988). The motivation to experiment: A study of gifted adolescents attitudes toward scientific research. Journal for the Education of the Gifted, 11, 19-35.
- Subotnik, R. F., & Steiner, C. (1994). Adult manifestations of adolescent talent in science: A longitudinal study of 1983 Westinghouse Science Talent Search winners. In R. F. Subotnik & K. D. Arnold (Eds.), Beyond Terman: Contemporary longitudinal studies of giftedness and talent (pp. 52-76). NJ: Abex.
- Subotnik, R. F., Duschl, R. A., & Selmon, E. H. (1993). Genius revisited: High IQ children grown up. Norwood, NJ: Ablex Publishing Corporation.

- Subotnik, R., Kassan, L., Summers, E., & Wasser, A. (1993). Genius revisited: High IQ children grown up. Norwood, NJ: Ablex Publishing Corporation.
- Super, D. E. (1957). The psychology of careers. New York: Harper & Row.
- Super, D. E. (1982). The relative importance of work: Models and measures for meaningful data. The Counseling Psychologist, 10, 95-104.
- Super, D. E. (1984). Perspective on the meanings and value of work. In N. C. Gyspers (Ed.), Designing careers: Counseling to enhance education, work, and leisure (pp. 27-53). San Francisco: Jossey-Bass.
- Super, D. E. (1990). A life-span, life-space approach to career development. In D. Brown, L. Brooks, & Associates (Eds.), Career choice and development: Applying contemporary theories to practice (2nd ed., pp. 197-261). San Francisco: Jossey-Bass.
- Surrey, J. L. (1985). Self-in-relation: A theory of women's development. Work in Progress. Wellesley, MA: Stone Center for Developmental Services and Studies.
- Sutherland, E., & Veroff, J. (1985). Achievement motivation and sex roles. In V. E. O'Leary, R. K. Unger & B. S. Wallston (Eds.), Women, gender, and social psychology (pp. 101-128). NJ: Lawrence Erlbaum.
- Swenson, M. M. (1996). Essential elements in a qualitative dissertation proposal. Journal of Nursing Education, 35, 188-190.
- Tangri, S. (1974). Determinants of occupational role innovation among college women. Journal of Social Issues, 38, 177-199.
- Tannen, D. (1990). You just don't understand: Women and men in conversation. New York: Ballentine Books.
- Tavris, C. (1992). The mismeasure of women: Why women are not the better sex, the inferior sex, or the opposite sex. New York: Basic Books.

- Terman, L., & Oden, M. (1959). Genetic studies of genius: Volume 5. The gifted group at midlife. Stanford, CA: Stanford University Press.
- Tesch, R. (1990). Qualitative research: Analysis types and software tools. New York: Falmer Press.
- The United Nations. (1991). The world's women 1970-1990: Trends and statistics (UN Sales No. E90XVII. 3A). New York: United Nations.
- Thorndike, K. L., & Hagen, E. (1959). 10,000 careers. New York: Wiley.
- Tomlinson-Keasey, C., & Little, T. D. (1990). Developing our intellectual resources for the 21st century: Educating the gifted. Journal of Educational Psychology, 32, 442-455.
- Wagner, R., & Sternberg, R. (1985). Practical intelligence in real-world pursuits: The role of tacit knowledge. Journal of Personality and Social Psychology, 49, 436-458.
- Walker, B., Reis, S., & Leonard, J. (1992). A developmental investigation of the lives of gifted women. Gifted Child Quarterly, 36 (4), 201-206.
- Warr, P., Cook, J., & Wall, T. (1979). Scales of measurement of some work attitudes and aspects of psychological well-being. Journal of Occupational Psychology, 52, 129-148.
- Washor-Liehaber, G. (1982). Women's career decision-making process: A feminist perspective. Women & Therapy, 1, 51-58.
- Weinrach, S. G. (1984). Determinants of vocational choice: Holland's theory. In D. Brown, L. Brooks, & Associates (Eds.), Career choice and development (pp. 61-93). San Francisco: Jossey-Bass.
- Wells, M. R. (1985). Gifted females: An overview for parents, teachers, and counselors. G/C/T, pp. 43-46.

- White, W. L. (1984). The perceived effects of an early enrichment experience: A fourth year follow-up study of the Speyer School experiment for gifted students. Unpublished doctoral dissertation, University of Connecticut, Storrs.
- White, B. A., Cox, C., & Cooper, C. (1994). Women's career development: A study of high flyers. United Kingdom: Blackwell Publishers.
- Worell, J. (1989a). Sex roles in transition. In J. Worell & F. Danner (Eds.), The adolescent as decision-maker: Applications for development and education (pp. 246-280). New York: Academic Press.
- Worell, J., & Remer, P. (1993). Feminist perspectives in therapy: An empowerment model for women. New York: Wiley.
- Wortley, D., & Amatea, E. (1982, April). Mapping adult life changes: A conceptual framework for organizing adult development theory. Personnel and Guidance Journal, 476-482.
- Yewchuk, C. (1992). Gender issues in education. Paper presented at 6th Canadian Symposium (SAGE).
- Yewchuk, C., & Chatterton, S. (1990). Career development of eminent Canadian women. In S. Bailey, E. Braggett, & M. Robinson. The Challenge of Excellence. AAEGT.
- Young, B., & Ansara, S. (1998, June). Few women hold positions of authority in Alberta's schools - ATA survey. The ATA News, 32.
- Zunker, V. C. (1986). Career counseling: Applied concepts of life planning. Monterey: Brooks-Cole.
- Zytowski, D. G. (1969). Toward a theory of career development for women. Personnel and Guidance Journal, 47, 660-664.

APPENDIX A

INVITATION TO PARTICIPATE



August 1, 1997

Dear Participant:

Our research team, Dr. Judy Lupart, Dr. Alice Boberg, Michael Enman, Charlene Barva (The University of Calgary) and Dr. Elizabeth Smyth (OISE) would like to request your participation in a research study involving Shad Valley Program applicants and participants. This study is part of a 3 year research program funded jointly by the Social Sciences and Humanities Research Council of Canada and Northern Telecom, under the auspices of a Science and Culture Canada joint initiative. The purpose of the present study is to gain insights into factors influencing both interest in and involvement in science-related courses, programmes and careers.

There are two parts to this study and participation in either or both parts is voluntary. In Part 1, we are asking all study participants to complete a set of questionnaires. We will mail out to all participants the appropriate questionnaires with a target return date mutually agreed upon by the participant and researcher. We anticipate mailings to occur in the summer of 1997.

The first questionnaire in the set will take approximately 45 minutes to complete and it explores a variety of personal beliefs and attitudes known to influence achievement-related decisions. The second questionnaire will take approximately 20 minutes to complete and it surveys workplace values and life roles. The final questionnaire will take approximately 10 minutes to complete and it examines personal epistemology (i.e., beliefs about knowledge and learning) and the values a respondent assigns to his/her selected major or career.

In Part 2 of this study, respondents will be asked to participate in a 45 minute follow up telephone interview exploring personal, social, and achievement-related influences on participation in the sciences. All interview times and locations will be mutually agreed upon by the volunteer and the researcher.

Confidentiality and anonymity will be safe-guarded at all times. The researchers will not share individual information results with any other individuals prior to or following data collection. Once collected, responses will be kept in strictest confidence in a locked file cabinet in our research office at the University of Calgary. Only group results will be reported in any published studies.

The participant is encouraged to discuss and question all aspects of the research and will be free to withdraw at any time. If you have any questions or require any additional information, please call the principal investigator, Dr. Judy Lupart at the University of Calgary (403) 220-6280 or (403) 282-9244 (fax), Michael Enman (403) 220-5696 or Charlene Barva at (403) 556-7211.

Please complete the attached form to indicate your permission to participate in this research. A stamped addressed return envelope has been provided for your convenience.

Thank you for cooperation

Sincerely,

Judy Lupart, Ph.D.
Professor

2500 University Drive N.W., Calgary, Alberta T2N 1N4
Telephone: (403) 220-6280 Fax (403) 282-9244

APPENDIX B

CONSENT FOR RESEARCH PARTICIPATION



Department of Educational Psychology

PARTICIPANT CONSENT FORM

I, the undersigned, hereby give my consent to participate in a research study exploring personal, social, and achievement-related influences on Shad Valley participants and applicants' involvement in the sciences. This study is part of a 3 year research program funded jointly by the Social Sciences and Humanities Research Council of Canada and Northern Telecom, under the auspices of a Science and Culture Canada joint initiative.

I understand that such consent (indicated by marking the blanks below) means participating in either one or both parts of the study.

Part 1

_____ Three questionnaires. The first questionnaire, completed in approximately 45 minutes, explores a variety of personal beliefs and attitudes known to influence achievement-related decisions. The second questionnaire, completed in approximately 20 minutes, surveys workplace values and life roles. The third questionnaire, completed in approximately 10 minutes, examines personal epistemology (i.e., beliefs about knowledge and learning) and the values a respondent has assigned to his/her selected major or career.

Part 2

_____ A 45 minute follow up telephone interview exploring personal, social, and achievement-related influences on participation in the sciences. All interview times and locations will be mutually agreed upon by the volunteer and the researcher.

I understand that participation in this study may be terminated at any time by my request or at the request of the investigator. Participation in this study and/or withdrawal from this study will not adversely affect me in any way.

I understand that my responses will be kept confidential and only group data will be reported in any published reports. Once collected, responses will be kept in strictest confidence in a locked file cabinet in our research office at the University of Calgary.

I have received a copy of this consent form for my records. I understand that if I have any questions I can contact the principal investigator, Dr. Judy Lupart at (403) 220-6280 or (403) 282-9244 (fax), the Office of the Chair, Faculty of Education Joint Ethics Review Committee at (403) 220-5626, or the Office of the Vice-President (Research) at (403) 220-3381.

Date

Signature

Telephone number

Participant's Printed Name

E-mail address (Optional)

APPENDIX C

The Values Scale - Canadian Work Importance Study

Directions

This inventory is a measure of how you feel about things you were doing in your life. It asks you about the meaning and importance of various kinds of values and activities. There are no right or wrong answers. Your answers will help you identify what is important to you as you plan your life and your career.

Turn the page and begin.

For each of the following statements, indicate how important it is to you. Use the following scale:

- 1 means **of little or no importance**
- 2 means **of some importance**
- 3 means **important**
- 4 means **very important**

It is now or will be important for me to . . .

- 1 use all my skills and knowledge
- 2 obtain results that show I have done well
- 3 get ahead
- 4 make life more beautiful
- 5 help people with problems

- 6 be able to take charge when necessary
- 7 act on my own
- 8 discover, develop, or design new things
- 9 be able to afford the things I want
- 10 live according to my own ideas

- 11 develop as a person
- 12 exercise
- 13 be admired for my knowledge and skills
- 14 do things that involve some risk
- 15 take part in activities with other people

- 16 spend time with people who are special to me
- 17 have each day be different in some way
- 18 have good space and light in which to work
- 19 live where people of my religion and race are accepted
- 20 work hard physically

- 21 do work in which I have abilities
- 22 know that my efforts in life will show
- 23 advance quickly in my career
- 24 find pleasure in the beauty of my work
- 25 be involved in work which helps people

- 26 be a leader on the job
- 27 make my own decisions at work
- 28 create something new in my work
- 29 have a good income
- 30 live my life my way

- 31 have ideas about what to do with my life
- 32 take part in physical activities
- 33 receive recognition for my accomplishments
- 34 feel that there is some risk or danger in my work
- 35 work in a group rather than by myself

- 36 do things with people I like
- 37 do a number of different things each day
- 38 have good facilities at work
- 39 work where people of my ethnic origin can have good careers
- 40 be able to carry heavy things easily

- 41 do work in which I can develop my abilities
- 42 reach a high standard in my work
- 43 be able to get promotions
- 44 be concerned with beauty in my work
- 45 help others

- 46 manage things at work
- 47 be free to get on with a job in my own way
- 48 have the opportunity to try out new ideas at work
- 49 work where employment is regular and secure
- 50 work at what I want to when I want to

- 51 find personal satisfaction in my work
- 52 be physically active in my work
- 53 be respected for the quality of my work
- 54 take on dangerous tasks, if they interest me
- 55 be with other people while I work

- 56 work with people I like
- 57 change work activities frequently
- 58 be protected from the weather while I work
- 59 work in a language in which I am comfortable
- 60 use my physical strength at work

61 use my talents in my work
62 achieve the goals I have set for myself
63 work where people have a chance to get ahead
64 add to the beauty of my environment
65 give help to those who need it

66 have others follow my instructions
67 be independent
68 invent new ways to solve problems
69 be financially secure
70 choose my own style of life

71 take my responsibilities seriously
72 be physically fit enough to do my job
73 have others think well of the work I do
74 take chances in my life
75 be involved with others

76 have good friends
77 have variety in my life
78 work in a place that is free of hazards
79 use the language of my choice whenever I want
80 be able to move heavy objects

81 work at what I am good at
82 complete what I start
83 be successful
84 be able to appreciate beauty
85 be considerate of others

86 have the authority at work to get things done
87 choose how I am going to do my work
88 use my imagination whenever I can
89 earn a steady income
90 work where there are few rules or regulations

91 be responsible for doing my work well
92 keep my body fit
93 be known for doing good work
94 gamble when there is something to gain
95 spend time with friends

- 96 have friends who will help me when I have problems
- 97 have variety in my work
- 98 have a comfortable workplace
- 99 feel proud of my cultural heritage
- 100 be physically strong

APPENDIX D**The items attached to the 20 values of the Values Scale**

Ability Utilization	use all my skills and knowledge
Achievement	obtain results which show that I have done well
Advancement	get ahead
Aesthetics	make life more beautiful
Altruism	help people with problems
Authority	be able to take charge at work when necessary
Autonomy	act on my own
Creativity	discover, develop, or design new things
Cultural Identity	live where people of my religion and race are accepted
Economics	be able to afford the things I want
Life Style	live according to my own ideas
Personal Development	develop as a person
Physical Activity	exercise
Physical Prowess	work hard physically
Prestige	be admired for my knowledge and skill
Risk	do things that involve some risk
Social Interaction	take part in activities with other people
Social Relations	spend time with people who are special to me
Variety	have each day be different in some way
Working Conditions	have good space and light in which to work

APPENDIX E

Salience Inventory - Canadian Work Importance Study

Directions

The following questions ask you about some of the things you do in each of the activities below and how you feel about doing them. You may need to consider time in some questions and amount of quantity in others. Please read each statement carefully, then use the answer sheet to record your responses. Turn the page and begin.

Activity descriptions

Studying:

What you do to learn new things. It includes taking courses and going to school either during the day or in the evening. It covers all the work you do to prepare for class such as homework, assignments, and studying. It can also include the studying that you do on your own in order to learn how to do a hobby or to gain a new skill.

Working:

What you do to make money or profits, either on a job or by yourself.

Community Service:

What you do as a volunteer to help your community. It can include what you do in recreational groups like sports, leagues, on the student union, in self help groups, in neighbourhood associations, political parties, in trade unions, or in any other group or club where you are doing something to make life better or more interesting for those around you.

- Home and Family:** What you do to take care of your home, your family, and your responsibilities. It includes housework, repairs, washing, cooking, cleaning up after meals, shopping and looking after your dependents such as your children, relatives, or pets.
- Leisure Activities:** What you do for fun and relaxation. It can include things like taking part in sports or exercise, watching television, doing a hobby, going to the movies or spending time with your family and your friends.

Section I: Participation (what you actually do or have done recently).

On the answer sheet please find the section called Participation
Please do each item under letters A to J using the following scales.

- 1 means **Never or rarely**
- 2 means **Sometimes**
- 3 means **Often**
- 4 means **Always or almost always**

- A. I have spent time in or do spend time in
 - 1 studying
 - 2 working
 - 3 community service
 - 4 home and family
 - 5 leisure activities

- B. I have talked to do talk to people about
 - 6 studying
 - 7 working
 - 8 community service
 - 9 home and family
 - 10 leisure activities

- C. I have spend or do spend time reading about
 - 11 studying
 - 12 working
 - 13 community service
 - 14 home and family
 - 15 leisure activities

- D. I have taken or do take advantage of opportunities in
 - 16 studying
 - 17 working
 - 18 community service
 - 19 home and family
 - 20 leisure activities

- E. I have read some books and magazines on
 - 21 studying
 - 22 working
 - 23 community service

- 24 home and family
- 25 leisure activities

F. I have been or am active in an organization that has to do with

- 26 studying
- 27 working
- 28 community service
- 29 home and family
- 30 leisure activities

G. As often as I can I take part in

- 31 studying
- 32 working
- 33 community service
- 34 home and family
- 35 leisure activities

H. I have improved my performance in

- 36 studying
- 37 working
- 38 community service
- 39 home and family
- 40 leisure activities

I. I am active in

- 41 studying
- 42 working
- 43 community service
- 44 home and family
- 45 leisure activities

J. I encourage others to spend time in

- 46 studying
- 47 working
- 48 community service
- 49 home and family
- 50 leisure activities

Section II: Commitment (how I feel about it).

On the answer sheet please find the section called Commitment.
Please do each item under letters A to J using the following scales.

- 1 means **Little or none**
- 2 means **Some**
- 3 means **Quite a lot**
- 4 means **A great deal**

A. It is or will be important to me to be good in

- 1 studying
- 2 working
- 3 community service
- 4 home and family
- 5 leisure activities

B. I am or expect to be very much involved in

- 6 studying
- 7 working
- 8 community service
- 9 home and family
- 10 leisure activities

C. I would like to be remembered for what I did in

- 11 studying
- 12 working
- 13 community service
- 14 home and family
- 15 leisure activities

D. I would like to be active for many years in

- 16 studying
- 17 working
- 18 community service
- 19 home and family
- 20 leisure activities

E. I am committed to being active in

- 21 studying
- 22 working
- 23 community service

- 24 home and family
- 25 leisure activities

F. I am or will be proud to do well in

- 26 studying
- 27 working
- 28 community service
- 29 home and family
- 30 leisure activities

G. I feel personally involved in

- 31 studying
- 32 working
- 33 community service
- 34 home and family
- 35 leisure activities

H. I admire people who are good at

- 36 studying
- 37 working
- 38 community service
- 39 home and family
- 40 leisure activities

I. I find it fulfilling to take part in

- 41 studying
- 42 working
- 43 community service
- 44 home and family
- 45 leisure activities

J. I would like to have plenty of time for

- 46 studying
- 47 working
- 48 community service
- 49 home and family
- 50 leisure activities

Section III: Role Values

In this section, you will be asked questions which may sound like those you have already answered. However, here your answers will show what values you seek in each of the five major life roles: studying, working, community service, home and family, and leisure activities. What you value may often differ in each activity. Please read each of the following statements carefully.

On the answer sheet please find the section called Role Values. Please do each item in letters A to N using the following scale:

- 1 mean **Little or none**
- 2 means **Some**
- 3 means **Quite a lot**
- 4 means **A great deal**

What opportunity do you see now or in the future to . . .

A. use all your skills and knowledge in

- 1 studying
- 2 working
- 3 community service
- 4 home and family
- 5 leisure activities

B. be good at

- 6 studying
- 7 working
- 8 community service
- 9 home and family
- 10 leisure activities

C. be able to appreciate beauty through your

- 11 studying
- 12 working
- 13 community service
- 14 home and family
- 15 leisure activities

D. help others through your

- 16 studying
- 17 working

- 18 community service
- 19 home and family
- 20 leisure activities

E. act on your own in

- 21 studying
- 22 working
- 23 community service
- 24 home and family
- 25 leisure activities

F. use your imagination in

- 26 studying
- 27 working
- 28 community service
- 29 home and family
- 30 leisure activities

G. be able to afford to

- 31 studying
- 32 working
- 33 community service
- 34 home and family
- 35 leisure activities

H. have the following be part of your life

- 36 studying
- 37 working
- 38 community service
- 39 home and family
- 40 leisure activities

I. be physically active as part of your

- 41 studying
- 42 working
- 43 community service
- 44 home and family
- 45 leisure activities

J. be recognized for your accomplishments in

- 46 studying
- 47 working
- 48 community service

- 49 home and family
- 50 leisure activities

K. gamble where there is something to gain by

- 51 studying
- 52 working
- 53 community service
- 54 home and family
- 55 leisure activities

L. do things with other people in

- 56 studying
- 57 working
- 58 community service
- 59 home and family
- 60 leisure activities

M. have variety in

- 61 studying
- 62 working
- 63 community service
- 64 home and family
- 65 leisure activities

N. have good conditions for

- 66 studying
- 67 working
- 68 community service
- 69 home and family
- 70 leisure activities

APPENDIX F**SHAD: In-depth Telephone Interview Questions**

1. What are your three greatest achievements: As a student? As an adult?
2. In retrospect, who do you regard as most influential in terms of your current life-role choices? (Please rank order)
 - your parents/family
 - your teachers/professors
 - your spouse/partner
 - other
3. In what way(s) have they influenced you?
4. On a scale of 1-10 how satisfied are you in the following:
 - family
 - career
 - friendship
 - richness of cultural life
 - joy in living
 - actualization of potential
 - physical development/well-being
 - adult life-role balance
5. In retrospect, what was the most exciting/important experience in your life? What factors account for this?
(peer support, hard work, high ability, family support, luck/choice, other)
6. In retrospect, what was the greatest regret/disappointment in your life? What factors account for this?
(difficulty level, bad luck, insufficient effort, family/peers, ability, other)

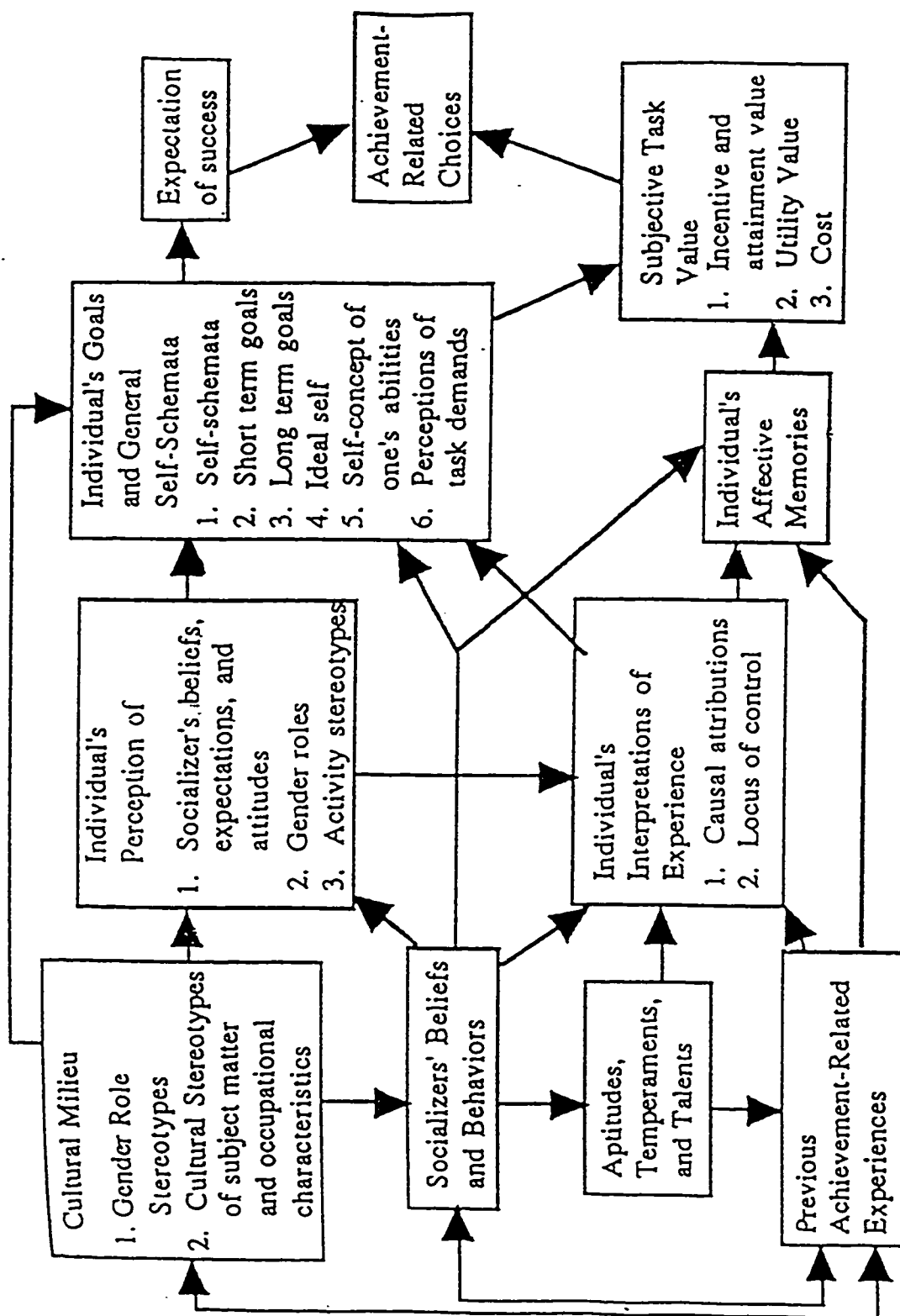
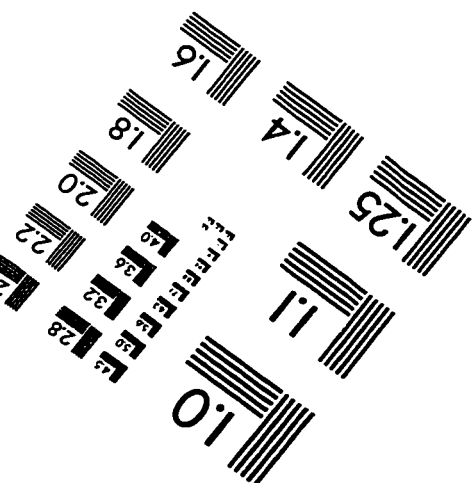
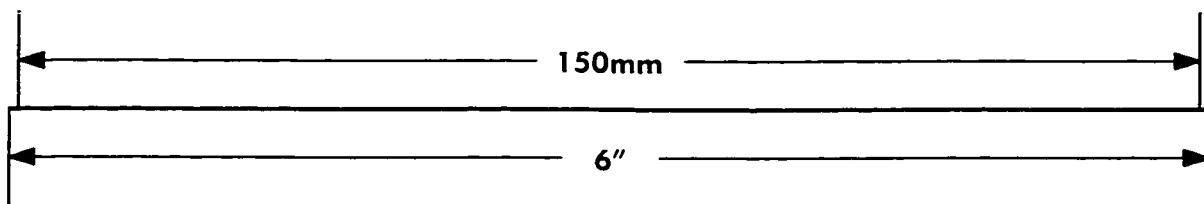
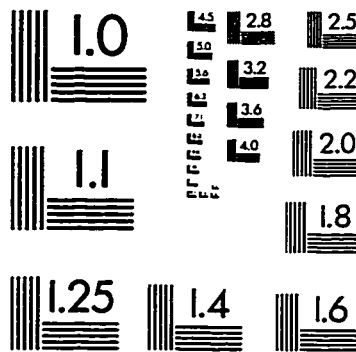
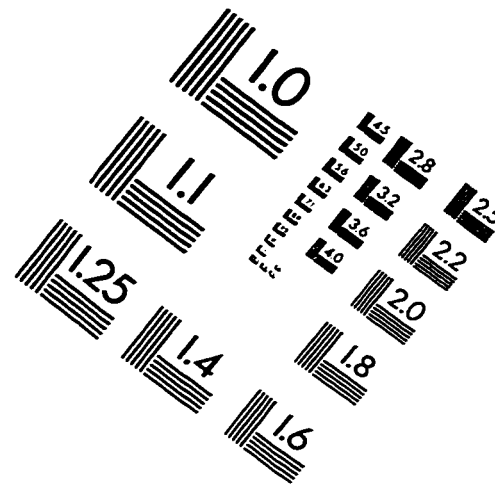
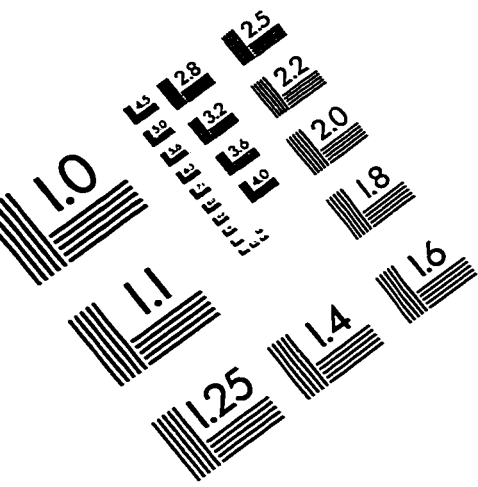
Figure 1 Eccles Achievement-Choice Model

Figure 1. General model of achievement-related choices. Eccles, J. S., & Harold, R. D. (1992). (Adapted from Parsons, J. E., Adler, T. F., Fulleman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Perspectives on achievement and achievement motivation*. San Francisco, CA: Freeman, 1983).

IMAGE EVALUATION TEST TARGET (QA-3)



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