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Multipotentiality in Gifted Youth: A Nine-Year Follow-Up Study

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Abstract

While the concept of multipotentiality is often referred to in the giftedness literature, implicit and explicit definitions of the concept change from author to author. Additionally, few empirical studies have been done to provide support for the many anecdotal claims made about multipotentiality. The present nine-year follow-up study (N = 180) of gifted youth (mean age = 20.2 years) provides evidence that many gifted individuals may indeed be multipotentialed. The definition of multipotentiality ("the ability and desire to pursue different activities and goals") used to operationalize the concept was validated by six experts in the field. Degree of multipotentiality was found to be significantly related to SES, verbal IQ, variety of interests and abilities, participation in leisure activities, answer-seeking, attitude towards school, and several scores derived from the 1993/94 administration of the Strong Interest Inventory. Multipotentiality was not, however, found to be related to Holland's (1985) concepts of differentiation, consistency, or vocational identity. It thus appears that experience with activities and perhaps motivation to learn contribute to the phenomenon of multipotentiality. Little evidence was found to support the contention reported in the giftedness literature that multipotentiality leads to career indecision. Additionally, few career-related experiences were found to differentiate between more or less "successful" multipotentialed subjects, although those who scored highest on the Vocational Identity Scale were more active in their career deciding (prioritizing and focusing interests) and less likely to view career planning as a frustrating and on-going process. Direction of causality for all of the mentioned results is unknown, and many avenues for future research including nongifted subjects have been illuminated.

Résumé

Malgré que le concept de multipotentialité est souvent référré à la littérature de surdové, les définitions implicites et explicites du concept change d'un auteur à l'autre. Également, quelques études empirique ont été fait pour supporter des anecdotes à propos des multipotentialités. Ces neufs années d'étude (N = 180) sur les jeunes surdovés (moyenne d'âge = 20.2 ans) démontrent que plusieurs personnes surdovés peuvent être multipotentiel. La définition de multipotentialité ("l'abilité et le désire de poursuivre différent défis et activités") pour mesurer le concept a été validée par six experts dans le domaine. Le degré de multipotentialité avait un rapport significatif avec le SSE, le QI verbal, la varieté des interêts et des abilités dans leurs temps libre, la recherche de response, l'attitude vis-à-vis l'école, et plusieurs résultats derivés du Strong Interest Inventory de 1993/94. La multipotentialité n'avait pas rapport aux concepts de Holland (1985): différentiation, consistance, et l'identitée vocationnelle. Peut-être que l'expérience avec les activités et la motivation d'apprendre contribuent au phénomene de la multipotentialité. Seulement un peu d'evidence à été trouvé pour supporter l'idée dans la littérature des surdovés que la multipotentialité cause de l'indécision vis-à-vis une carrière. Aussi, pas beaucoup d' experiences reliées au carrière ont été différenciées entre les sujets multipotentiel ayant plus ou moins du "succès." Par contre ceux avec le résultat le plus élevé étaient plus actif avec leurs planification de carrière et moins porter à croire que la planification de carrière est frustrante et longue. La direction de la causalité pour les résultats ci-haut n'est pas connue, et plusieurs avenues existent pour poursuivre de la recherche future incluant des sujets non surdovés.

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Many people have assisted, throughout the past year, in making the completion of my thesis possible. Not only did they make the task easier and more enjoyable, but they also helped to make it a real learning experience. I am grateful for all of their input. I consider myself lucky to have had the help of so many competent and kindly individuals.

My advisors, Dr. Bruce Shore and Dr. Andrew Carson, were the backbone of my support system. Bruce repeatedly helped to point me in the right direction and acted as a sounding board for various ideas. He was very enthusiastic about the project and my efforts. Much of what I have learned about producing a thesis can be credited to him. Andrew helped with several of the more concrete problems I faced. It was Andrew's suggestion to use a one-item expert-validated measure of multipotentiality, instead of designing an entire scale. As well, he provided the facilities and assistance to me to score the Strong Interest Inventories.

I was also fortunate to be able to turn to Dr. Gill Rejskind for assistance in interpreting the data that she collected in 1984--the data that made this follow-up study possible. Howard Schwartz at the Laurenval School Board readily assisted me to get in touch with many of the subjects from 1984 that I was unable to locate on my own. The task of recontacting the subjects was made less arduous by the assistance of Susan Karovitch, my office-mate and fellow graduate student, with whom I shared both frustrations and laughs. The Strong Advisory Board was generous enough to help to fund my project by providing the My Vocational Situation and Strong Interest Inventory instruments and scoring. I am also grateful for the expedient replies and detailed feedback received from the experts solicited to validate my multipotentiality definition: Dr. N. Colangelo, Dr. J. Delisle, Dr. R. Fredrickson, Dr. R. Milgram, Dr. P. Perrone, and Dr. D. Willings. Their thoughts helped to spur my own. Finally, I received assistance from Dr. Socrates Rapagna with my statistical analyses. He patiently helped me to plan, execute, and interpret a great many such analyses.

I saw my life branching out before me like the green fig tree in the story.

From the tip of every branch, like a fat purple fig, a wonderful future beckoned and winked . . . .

I saw myself sitting in the crotch of this fig tree, starving to death, just because I couldn't make up my mind which of the figs I would choose. I wanted each and every one of them, but choosing one meant losing all the rest, and, as I sat there, unable to decide, the figs began to wrinkle and go black, and, one by one, they plopped to the ground at my feet. (Plath, 1971, pp. 84-85)

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CHAPTER 1: REVIEW OF THE LITERATURE

Overview

Historically, those individuals who were willing and able to do a little of "everything"--make weapons, track animals, tan hides, construct shelters, engage in trade, and so on--were more likely to survive. Being a generalist would have been selected for in evolutionary terms (Futuyma, 1986; Grant, 1986). But once population increases led to competition for resources, and with the advent of agriculture when humans started living together in societies, the division of labour became the better strategy for survival (Durkheim, 1984).

This same trend is continued in today's society where most jobs call for specialization. No longer can one be the butcher, baker, and candlestick maker; instead one is asked to choose a single career path. For some individuals, the "multipotentialed," this choice involves rejecting many other "good" paths--rejecting, in fact, parts of themselves (Willings, 1986). Multipotentialed individuals have a variety of interests and abilities, which would appear to be beneficial, but can lead to much anguish when it comes to career decision-making (Kerr, 1991). The combination of "overchoice" (Pask-McCartney & Salomone, 1988) and having "parts of the self . . . never come to fruition" (Tyler, 1958, p. 7) can make career choice extremely difficult.

Most "gifted" individuals could be classified as multipotentialed (Milgram, 1989). Those who "can do anything" they choose may often find this more of a curse than a blessing. And the very individuals one may expect to need little career guidance may, in fact, benefit greatly from such interventions (Kerr, 1991). Without appropriate guidance, the talents that these individuals often bring to society may be lost. Thus it is necessary to study those talented generalists--the multipotentialed--to see how best to aid them in career selection. But in order to do this, the concept of multipotentiality must first be understood.

The purpose of this review is to examine and link together two bodies of literature --giftedness and career development--which speak, in slightly different dialects, of the phenomenon of multipotentiality. It is necessary to clarify what exactly is multipotentiality and what are its effects. The most widely used definition of multipotentiality comes from Fredrickson and Rothney (1972): The ability to "select and develop any number of competencies to a high level" (p. vii). In the giftedness field, multipotentiality is frequently discussed--over 100 times in the past 35 years, inevitably with reference to the career indecision it is reported to cause. In the field of career psychology, the term

"multipotentiality" is mentioned only briefly, however the concept of multipotentiality has been described under the guise of "low differentiation" in Holland's (1985) theory of vocational choice.

In both fields, multipotentiality is basically viewed in a negative light, as hindering successful career decision-making. The positive aspects of the Fredrickson and Rothney (1972) definition are generally overlooked. Evidence for the problems associated with multipotentiality, however, is conflictual and often anecdotal. As well, the term "multipotentiality" is used inconsistently to refer to multiple abilities, multiple interests, or a combination of the two (Rysiew, Shore, & Carson, submitted). Thus it is not clear which aspects of multipotentiality may lead to problematic career decision-making. This author seeks to sort through the literature and clarify what is actually known about multipotentiality, as well as what may moderate the effects of multipotentiality on "successful" career decision-making.

Literature on Multipotentiality

Psychology of Giftedness

While "it is doubtful that any one definition of giftedness will be written" (Delisle, 1992, p. 26), the many definitions that do exist (Davis & Rimm, 1989; Delisle, 1992; Pendaruis, Howley, & Howley, 1990; Renzulli, 1978; U.S. Commissioner of Education, 1972) can help to illuminate the concept of giftedness. For example, the United States Office of Education's revised definition of giftedness includes "children who give evidence of high performance capability in areas such as intellectual, creative, artistic, leadership capacity, or specific academic fields" (Education Consolidation and Improvement Act, PL 97-35, Section 582, 1981). In this example, as in other definitions of giftedness, the notion of multipotentiality, if it refers to multiple abilities, is apparent. Many use the term "multipotentialed" in this way (Davis & Rimm; Herr, 1976; Isaacs, 1973; Jepsen, 1979; Marshall, 1981; Willings, 1986), thus by definition the gifted can be considered multipotentialed. With such usage, the new term "multipotentialed" has become equated with the older term "gifted and talented" (Frederick, 1972; Fredrickson & Rothney, 1972). Perhaps this explains why "outside of the literature on the career multipotentiality of the gifted . . . little notice has been taken regarding the role that being multipotentialed may play in career indecision" (Pask-McCartney & Salomone, 1988, pp. 231-232).

The majority, however, who refer to multipotentiality are referring to both multiple abilities and multiple interests (Berger, 1989; Colangelo, 1991; Delisle & Squires, 1989; Kerr, 1991; Roper & Berry, 1986; Sanborn, 1974; Silverman, 1993). Nevertheless, these

two facets are often referred to inconsistently (Rysiew et al., submitted). Thus it has become apparent that the term "multipotentiality" needs clarification in order to better understand the outcomes said to result from being multipotentialed.

Evidence for multipotentiality comes from case studies of the gifted, longitudinal studies of career patterns, and analyses of vocational interests (Kerr, 1981a). Two researchers from the early part of this century who stand out for their contributions to the study of giftedness both added to the present understanding of multipotentiality. Hollingworth (1976) found gifted children to be "capable of so many different kinds of success that they may have difficulty in confining themselves to a reasonable number of enterprises" (p. 93). Terman and Oden (1947) also found many gifted adolescents to have a great breadth of interests and to fluctuate between career choices. Thus multipotentiality may be a mixed blessing.

Researchers at the University of Wisconsin's Research and Guidance Laboratory for Superior Students--including Fredrickson and Rothney (1972), whose definition of multipotentiality is the most widely cited--were involved in a research-through-service program for three decades. They worked with thousands of gifted secondary students in those years, accumulating much quantitative and qualitative data. Researchers found that these gifted students had consistently high scores across different aptitude and achievement tests and over time:

> Their scores typically exceed those of their age mates in virtually all areas covered .... Only rarely is any performance so low as to suggest that the individual who attained it would be unlikely to succeed in either education or career requiring strong performance in the competency measured. (Sanborn, 1974, p. 105)

Classwork showed this same pattern of high achievement. These gifted students were a "highly active group of young people ... involved in a wide variety of social, athletic, community, and solitary activities regularly" (Sanborn, p. 109). Follow up studies showed these patterns of achievement and extracurricular involvement to continue into and beyond college (Rothney, 1972).

Essays these gifted students wrote about themselves and their futures also contribute to the portrait of the multipotentialed person. Not only do such comments as those found in Appendix A illustrate these students' variety of interests, high level of performance, and desire to contribute to society, but they also show "considerable evidence that multipotentiality presents problems in choice among the many avenues given to brilliant persons" (Rothney, 1972, p. 87). For example:

> "Multipotentiality seems like such a wonderful problem to have. However, it can make deciding what you want to focus on for a major portion of the rest of your

> life very difficult. As a so-called 'gifted' student, I did extremely well in every subject . . . and didn't think much about what I was really interested in . . . I also played two musical instruments and sang very well . . . . I was also socially adept and had many leadership qualities. Because of such a wide range of abilities and interests, the idea of committing myself to a single area did not seem reasonable." (Pask-McCartney & Salomone, 1988, p. 234)

The multipotentialed have aptly been described as being "in danger of 'starving at the occupational smorgasbord because they can't decide which choices they want to make'" (Sanborn, 1974, p. 147). Such an accurate portrayal of multipotentiality is only available through case-study analysis (Rothney).

While a minority of students show a single area of ability and interest, "many children who are classified as gifted and talented show these qualities of multipotentiality" (Sanborn, 1974, p. 104). In light of such evidence--uniformly high scores in classwork and on aptitude and interest tests, high rates of participation in extracurricular activities, and frequent changes of college major and career plans, researchers at the University of Wisconsin's Research and Guidance Laboratory concluded that "the concept of multipotentiality is highly tenable" (Rothney, 1972, p. 89). In fact, "the frequency with which the laboratory personnel saw teens whose many interests and competencies make career choice a difficult problem led them to coin a new term: *multipotentiality*" (Delisle, 1992, p. 41).

However, not all gifted students are multipotentialed. Herr (1976) wrote of two categories of gifted students: the majority are multipotentialed, but some are highly talented in a rather narrow range of activities. Milgram (1989) likewise suggested that the majority of the gifted population, those who are considered "mildly" or "moderately" gifted, are multidimensional; while those who are "profoundly" gifted, a small minority, are unidimensional. The minority of gifted students who possess single talents have been given the descriptive label "early emergers" (Marshall, 1981). Kerr (1981a) has added two other subtypes to the gifted population: the creatively gifted and the academically talented. The multipotentialed and the early emerger subgroups are on a degree of specialization continuum and the creatively gifted and academically talented subgroups are on a conformity continuum (Roper & Berry, 1986).

The multipotentialed are known for their wide range of interests and aptitudes. Characteristics of such multipotentialed students are found in Table 1. Interviews and self-image questionnaires given to 60 gifted grade 12 students found that most participated in a wide range of school and extracurricular activities, and have abilities across most school disciplines (Leroux, 1986). Such multipotentialed individuals are

Table 1

Characteristics of Multipotentialed Students

Elementary School

1. Difficulty with making a choice when given an opportunity to choose a topic or project from among many options.
2. Multiple hobbies with only brief periods of enthusiasm.
3. Difficulty in finishing up and following through on tasks, even those that are enjoyable.
4. Excellence performance in many or all school subjects.

Junior High

1. Continued difficulty with decision-making.
2. Continued difficulty with follow through.
3. Continued excellence in many or all school subjects.
4. Multiple social and recreational activities with no clear preferences.
5. "Scheduled up" week with few free periods.

Senior High

1. Decision-making problems generalize to academic and career decisions.
2. Overly packed class schedule with maximum number of courses.
3. Extraordinary diversity of participation in school activities such as athletics, social club, music, newspaper, plays, and departmental clubs.
4. Chosen and appointed as leader of a wide variety of groups in school, religious activities, and community organizations.
5. High marks in most or all courses taken.
6. "High flat" vocational interest test profiles, showing interests and similarities to an unusually large number of occupations.
7. Occasional signs of stress and exhaustion: absences, frequent or chronic illnesses, periods of depression and anxiety, particularly during the busiest times.
8. Delay or vacillation about college planning and decision-making.

College

1. Multiple academic majors.
2. Three or more changes of college major.
3. Continued intense participation in extracurricular activities.
4. Continued outstanding academic performance.
5. Concern and worry over choice of career.
6. Hasty, arbitrary, or "going along with the crowd" career choice.

Adulthood

1. Multiple jobs in short period.
2. Excellent performance in most jobs.
3. General feeling of "lack of fit" in most jobs.
4. Feelings of alienation, purposelessness, depression, and apathy despite high performance and excellent evaluations.
5. Periods of unemployment and underemployment.
6. Patterns of falling behind same-age peers in career progress and sometimes in social development (marriage, family, community involvement).

Note. From Kerr, 1991, pp. 87-88.

thought to have a "hard time focusing on academic and career goals [and] tend to spread themselves too thin" (Roper & Berry, 1986, p. 52): "Their problems can be disguised as a 'world of opportunity'" (Roper & Berry, p. 52).

Not only do case and longitudinal studies give evidence of this phenomenon, so do the interest inventories used in career education. More able than average students were found, by French (1958), to have three or more scores over the 75th percentile on the Kuder Preference Record (Kuder, 1949). But while the able students were found to have significantly more interests than their peers, they were not found to have a wider diversity of interests. Gifted students were also found to score the same or higher than the normative sample on all but one scale of the Strong Interest Inventory (Hansen & Campbell, 1985): Gifted boys scored lower than the norm on the Adventure scale, which is actually thought to be a measure of immaturity (Fox, 1978).

Unfortunately for those multipotentialed individuals who take interest inventories seeking to discriminate between their many interests, the ceilings of the inventories may not be adequate to allow for such differentiation (Fredrickson, 1979). As well, the high flat profile gifted students often obtain on interest inventories--that which indicates many strong interests--may be more a reflection of past opportunities than a prediction of future endeavors (Fredrickson, 1979). Fredrickson (1979) further stated that "although it is generally understood in career counseling that gifted students have the potential for success and satisfaction in a stated number of occupations, research in this area has been sadly lacking" (p. 270). Unfortunately, this general lack of controlled research is common in fields dealing with people and their functioning. Most of what is known about multipotentiality and its effects is nonexperimental in nature, and hence many questions are left unanswered. Nevertheless, some facts and theories are better than none, and a start has been made to try to understand multipotentiality.

While the majority of the gifted population can apparently be described as multipotentialed, multipotentiality does not appear to cause difficulty for all involved. Only those "who see no way to combine or reconcile diverse abilities and interests" (Kerr, 1981a, p. 7) seem to suffer from the "curse" that may accompany multipotentiality. Indecision, inconsistency, and delay in college and career planning may be signals that multipotentiality is causing difficulties (Kerr, 1981a, p. 25). For those thus afflicted, the agony of indecision can be very burdensome. Simply put, "there are very few jobs which can provide an outlet for the whole range of such a person's talents" (Willings, 1986, p. 98).

The sentiment expressed in Delisle and Squire's (1989) definition of multipotentiality--"the interest and ability to succeed in so many vocational areas that choosing one career path becomes problematic" (p. 98)--has been voiced by many researchers (for example, Isaacs, 1973; Milgram, 1991; Milne, 1979; Rodenstein, Pfleger, & Colangelo, 1977; Sanborn, 1974). In two samples of National Merit Finalists, boys who scored high in career indecision reported having more competencies, higher extracurricular achievement, more experiences, and resource-richer homes than boys who were decided about their careers (Holland & Nichols, 1964). It seems that these boys had high levels of ability, interest, motivation, and opportunity, and as a result were finding it difficult to decide upon a career.

Fredrickson (1979) wrote of the "exceedingly large number of occupations to consider . . . [which leads to] frustration, apathy, and procrastination" (p. 267), as well as "anxiety-producing ambiguity" (Hollinger, 1991, p. 135). Perrone & Van Den Heuvel (1981) concurred that "discriminating among a host of careers becomes a formidable task, often so formidable that it may be avoided" (p. 303). Uncertainty about college major was found to increase with academic ability, from students in the 80th percentile to those in the 95th and 99th percentiles. More female than male students experienced uncertainty at the 99th, as well as at the 95th, percentiles (Kerr & Colangelo, 1988). When "confronted with an abundance of options, gifted students may vacillate and dabble, fearing to commit themselves to one career" (Kerr, 1985, p. 171. for by "focusing on one talent area . . . [one is] rejecting other areas" (Willings, 1986, p. 95).

This indecision may continue from high school into college and adulthood with "a floating around from one job to another" (Isaacs, 1973, p. 57), the gifted seeming to possess a "stronger need to change jobs" (Herr, 1976, p. 101). Kerr (1981a) described multipotentialed students who,

> may vacillate between career choices, delaying career decisions until financial need and the end of a nonfocused education drive them to take a job by default. As an adult, the multipotiential gifted individual may flounder through a series of jobs, finding success but little satisfaction in any. (p. 5)

In summarizing the research on career patterns of the gifted, evidence of such delay and unpredictability was found (Jepsen, 1981). It seems that such individuals are "more variable than consistent in their vocational choices" (Fredrickson, 1972, p. 72). Individuals who suffer this chronic indecision "pay the price." In a 10-year follow-up study, those individuals who had maintained a stable career choice since high school graduation were more satisfied and held higher status jobs. The individuals whose career choice had been unstable were characterized as less able to plan, and hence had lost

valuable time which resulted in lower satisfaction and status (Martins & Pulvino, 1975). Torrance (1971) wrote that highly intelligent and creative individuals may find themselves discriminated against because they are apt to change jobs "too often."

The career choice of such individuals may be "vulnerable to chance happenings" (Fredrickson, 1972, p. 59): "A multipotential individual may select a vocational choice almost at random and then set out to acquire the qualifications and characteristics that will make him [or her] successful in that career" (Fredrickson, 1972, p. 72). Silverman (1993) wrote of "some gifted children who arbitrarily select careers at a very young age simply to avoid dealing with the overwhelming multitude of career options available to them. Having too many choices can be threatening" (p. 220). Anxiety about career decisions was found to be greater in gifted than in nongifted students (Karnes & Oehler-Stinnett, 1986). The gifted "experience the same concerns about future decision as do their age peers, yet these concerns may be exacerbated by the variety of choices their multipotential permits" (Delisle & Squires, 1989, p. 102).

As well, for the gifted, "aptitude is an insufficient criterion for selecting a career" (Silverman, 1993, p. 215)--interests, motivations, and personality play a large role in career development (Passow, Goldberg, Tannenbaum, & French, 1955). Ironically, part of "the problem gifted students have is that they can be successful in so many areas" (Rodenstein et al., 1977, p. 341). There is little need for the gifted to "temper their dreams with the reality of their limitations" (Silverman, p. 221); instead they are "hampered by the heavy burden known as 'you can be anything you want to be'" (Bireley & Genshaft, 1991, p. 13). As well as getting to the core of the problem (Kerr, 1981a) and causing considerable frustration (Perrone & Van Den Heuvel, 1981), this oft-repeated phrase "somewhat negates and denies what and who they already are, placing them on a treadmill of continually becoming something beyond their immediate selves" (Perrone, Karshner, & Male, 1979, p. 14).

Such an "anything is possible" attitude can hinder the ability of the individual to acknowledge any weaknesses or limitations (Perrone et al., 1979). Thus one possible aid to discrimination between career choices is lost. It is also difficult for those who receive an abundance of positive reinforcement "to sort out what they value from what others value for them" (Perrone et al., p. 12), thus multipotentiality was aptly called an "embarrassment of riches" (Gowan, 1960, p. 275). "Many of these adolescents wonder how they will be able to make college and career plans when, on the surface, they like everything and are good at everything" (Berger, 1989, p. 21): They love learning and want to try everything (Ehrlich, 1982). For example, expected participation in

extracurricular activities was found to increase (although no correlations were reported) with level of academic ability in a large-scale ($N = 76,951$) study of high school juniors and seniors (Kerr & Colangelo, 1988). For many high-ability individuals, vocational selection is an "existential dilemma" (Silverman, 1993) which often goes hand-in-hand with an identity crisis (Herr, 1976; Perrone & Van Den Heuvel, 1981). Multipotentiality can certainly be viewed as "a problem disguised as a *world of opportunity*" (Delisle, 1982, p. 9). But there is more to this problem of painful indecision than just multiple interests and aptitudes--other factors contribute to this phenomenon.

The gifted put great emphasis upon choosing a career. They are well aware that vocational choice is one of the most important decisions that will be made in one's lifetime:

> To most of them, the selection of an occupation is seen as a highly significant act. They do not seek merely an occupation in which they could do well and in which they would be "interested." They look for a career which is to be their principle means of self-expression, whereby they may implement a philosophy of life. (Sanborn, 1974, p. 115)

But, "the first and most often noted problem is that a single career or line of work may not draw upon all of their interests and abilities nor provide sufficient fulfillment of all their needs to achieve or create" (Shore, Cornell, Robinson, & Ward, 1991, p. 241). No longer is work the central aspect of one's life (Carroll, Paine, & Miner, 1973). Similarly, no longer is the purpose of a career simply to earn a living: The significance of working hard to be a good provider has decreased while that of finding a career that is fulfilling and fits into one's desired lifestyle has increased (Yankelovich, 1981).

Bennis (1970) wrote of the dynamic conflict between the traditional Western values of achievement, self-control, independence, endurance of stress, and full employment and the emerging values of self-actualization, self-expression, interdependence, capacity for joy, and full lives. It is often the gifted who are striving for the emerging values. They are the ones who "regard their work as a major means of self-expression. Thus, for the gifted, occupational choice becomes a choice of life-style" (Rodenstein et al., 1977, p. 342). Career choice for the gifted is highly value-driven: "They engage in a search for meaning rather than the search for a job" (Kerr & Claiborn, 1991, p. 76). These multipotentialed individuals "find all aspects of life fascinating, and don't want to miss any of it" (Silverman, 1993, p. 220). They want to "remain intellectually active" (Delisle & Squires, 1989, p. 102) and continue learning. They also want to contribute to society (Jepsen, 1979).

What responsibility they place upon themselves, their fate seeming to hang on a single decision. And as "any door to their future is closed by choice, . . . what if they

make the wrong choice?" (Silverman, 1993, p. 221). Many multipotentialed gifted individuals suffer from perfectionism: The "perfect" career for them exists and they must find it and succeed at it (Perrone et al., 1979). These individuals have a "fear of being less than their ideal or not living up to their potential" (Silverman, p. 221). It is very stressful and very difficult to "measure-up," thus some remain lifelong students. They are comfortable in the role and recognition is easily obtainable (Perrone et al.): There they are "almost guaranteed 'success'" (Sanborn, 1974, p. 147).

Some multipotentialed students likewise choose "safe" academic majors (Kerr, 1991). Some make decisions based on pragmatism, earning potential, or conformity with peers (Astin, Green, & Korn, 1987). Others give in to expectations of parents, teachers, or society in general: Pressure to achieve at high levels or sex-role expectations restrict the range of available career options (Sanborn, 1974). With such expectations, "the multi-talented student is constantly being pulled in different directions" (Marshall, 1981, p. 306). In such cases, career choice is not "a matter of commitment but one of default" (Herr & Watanabe, 1979, p. 255).

Such high expectations, from the multipotentialed individual as well as from others, can lead to related problems. Early commitment, a long training period, and a heavy investment are needed for many chosen careers (Sanborn, 1974). Economic independence, as well as starting a family, may be delayed until formal education is completed (Colangelo, 1991). During the time it takes for entry into a given occupation, the person and the occupation may each have changed (Perrone et al., 1979); but "once a few years along the career track, it becomes difficult to see the possibility of change" (Sanborn, p. 123). Unfortunately the multipotentialed are "without appropriate norm comparisons and have few readily accessible models" (Jepsen, 1979, p. 280) to help guide their career paths.

All of the above-mentioned career decision-making problems have been classified into three areas by Kerr (1981b): making a single career choice despite multipotentiality, reconciling personal career goals and societal expectations, and making long-range career plans before having the necessary emotional maturity. Kerr (1981a) further stated that multipotentiality is the most commonly observed of these career decision-making problems. This supposition has been challenged by Emmett and Minor (1993), however, whose study was "designed to identify the factors considered in career decision-making by today's gifted youth, as well as to investigate, from their perspective, the sources of greatest difficulty in their career decision-making" (p. 351). The researchers were concerned that "the most recent reports of the career problems of gifted youth . . . [are]

based on research done 10, 20, 30, and even 60 years ago" (p. 351).

Emmett and Minor (1993) did a cross-sectional study of three cohorts of gifted adolescents. Each cohort consisted of 10 students who were thought to be at critical decision-making points in their career development. One group had just graduated from high school and selected a college, another group had already completed two years of college and just selected their majors, and the last group had just completed college and either selected a graduate school or job. The 30 subjects were interviewed and questioned about what career decisions they had made, what factors had influenced their decisions, what difficulties had occurred, and how these difficulties had been resolved. The researchers identified 20 factors as being important to career decision-making. These factors clustered into five groups: Sensitivity to Other's Expectations, Perfectionism, Multipotentiality, Superior Intelligence, and Developmental Issues (listed in descending order of importance).

The Expectations cluster included issues of expectations, relationship pressures, responsibility, desire to help, being above-average, and prestige. The Perfectionism cluster included issues of future concerns, being above-average, lack of ability, meaningfulness, accomplishment, and being true to self. The Multipotentiality cluster consisted of the issue of future considerations. The Intelligence cluster included issues of challenge, variety, and learning. The Development cluster included issues of accessibility, autonomy, and being true to self. Many of the problems associated with being gifted and career indecision were thus substantiated in this study.

Contrary to what is repeated in the giftedness literature--that multipotentiality is a common problem amongst gifted individuals making career choices--only approximately 10% of the career decisions made by the subjects involved a direct concern about multipotentiality: "desire to keep options open because of their interest in more than one area" (Emmett & Minor, 1993, p. 360). Likewise, except for the cohort group which had just selected the college major, few difficulties with multipotentiality were expressed. Several explanations are possible as to why multipotentiality was not found to be the dominant explanation of career indecision. First, the sample came from a single school's gifted program and hence was not representative of gifted students in general--perhaps that school's program helped to alleviate any ill-effects of multipotentiality. As well, most of the subjects were still students and had not yet made that "final leap" into a career, more firmly committing themselves to a single option. Second, multipotentiality--as it is currently defined--is not the problem researchers have for years made it out to be. Perhaps case studies of multipotentiality exaggerate both the degree and frequency of

problems associated with multipotentiality.

Surely not all multipotentialed persons suffer from painful career indecision. Why not? Summaries of interviews with 20 of the top research neurologists in the United States describe how these multipotentialed individuals kept their options open and were able to combine their different interests in careers that provide for constant learning and satisfaction (Sosniak, 1985). How were these individuals able to exploit their talents when others cannot? An answer to this question could alleviate a great deal of existential struggling and would provide society with more well-functioning, contributing members of the highest calibre. Further research in this area is much needed to better understand the problem and its solution, for in general the "career development of the gifted has not been the subject of extensive empirical inquiry" (Kelly & Cobb, 1991, p. 202).

Psychology of Career Development

Reference to multipotentiality in the general career psychology literature is scant. Kitson (1925) wrote of numerous unrelated interests "victimizing" some who sought to make vocational selections. In an early book on interest measurement, Fryer (1931) described a case study: "a man with extremely varied interests . . . . This man could have entered, it would seem, any one of several occupations, and achieved a satisfactory occupational life" (pp. 5-8). What Fryer described is an example of multipotentiality. This concept was more formally introduced by Super (1953) who wrote that "each person has the potential for success and satisfaction in a number of occupations" (p. 187). Yet this idea of career multipotentiality has not been exploited. In fact, it flies in the face of tradition, where vocational choice has been perceived as "a matter of identification of single talents, a narrowing-down process" (Fredrickson, 1972, p. 64).

Instead of being seen as beneficial, multipotentiality has been viewed in the opposite way, especially with regard to decision-making. Crites (1969) was one of the first to define and speak of the negative side of multipotentiality--that of career indecision: "The multipotential individual has two or more choices . . . on the appropriate aptitude level . . . . His [or her] problem is that he [or she] cannot decide among the alternatives" (p. 298). For, "although it is exciting to know that one has several opportunities, it may also be anxiety-provoking and confusing to be confronted with such 'overchoice'" (Pask-McCartney & Salomone, 1988, p. 234). Positive-choice conflict, one of the four factors that emerged from the factor analysis of a career indecision scale, was seen "to represent an 'approach-approach' problem where the student has difficulty deciding from among a number of attractive alternatives" (Osipow, Carney, & Barak, 1976, pp. 239-240). Decision-making is much more complex as one tries to choose from among several "good"

choices. This painful task can be seen as so insurmountable that it is put off, and chronic career indecision can result.

Within the career-psychology field, one theorist--John Holland--has written extensively about interests and career choice. Holland's (1985) theory of vocational choice is based upon the matching of personal with environmental interests. Holland discussed the implications of having too many diverse interests, and hence indirectly referred to multipotentiality. He did not, however, address the more global issues thought to accompany multipotentiality. Nevertheless, since vocational interest inventory profiles are thought to be good indicators of multipotentiality (Pask-McCartney & Salomone, 1988), Holland's theory is relevant.

Since 1959, Holland has provided eight accounts of his theory of vocational choice. Holland (1985) bases his theory on four key assumptions: (a) people can be categorized according to six vocational personality types--Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), or Conventional (C); (b) there exist six corresponding environments, defined by the people who inhabit them; (c) people search for like environments in which they can best express their personality; and (d) one's vocational behaviour is largely determined by the interaction between one's personality type and one's environment. Hence one's personality type is predictive of the type of environment one will seek out and the process this search will take. These personality and environmental patterns are described in profiles which rank the six types in order of importance.

The fact that "each of the six personality styles may exist within an individual acknowledges the multipotential or adaptive nature of the person seeking to make a vocational choice" (Fredrickson, 1972, p. 63). As well, some types may be more prone to have multiple interests than other types. Holland (1985) postulated that creativity is associated, in descending degree of importance, with the following types: A, I, S, E, R, C. This same pattern was found to exist in relation to Openness to Experience Scale scores on Costa and McCrae's (1985) NEO Personality Inventory (Costa, McCrae, & Holland, 1984; Holland, Johnston, Hughey, & Asama, 1991). Holland et al. (1991) proposed that this explains unpublished data collected at the Institute of Personality Assessment and Research in 1953: Persons typed A or I were found to have a wide range of interests, while persons typed R or C were found to have a narrow range of interests. On the other hand though, Campbell (1971) found creative types (A and I) to unexpectedly score at the low end of the Diversity of Interests Scale--a scale found on earlier versions of the Strong Interest Inventory (Hansen & Campbell, 1985). Whether or not certain types are more

multipotentialed than other types is unclear. Other factors must be at play.

Holland (1985) supplemented his theory with five secondary assumptions. The calculus assumption states that the six personality or environmental types can be ordered in a hexagonal arrangement according to the degree of theoretical relation between them: R-I-A-S-E-C, where C is also adjacent to R. The congruence assumption contends that the more closely one's personality type matches that of the environment, the more favourable will be the outcomes. For example, personal and vocational stability, academic and vocational achievement, and personal and vocational satisfaction will all increase. The differentiation assumption asserts that the more closely a person or environment resembles a single type, the more predictable will be the previously mentioned favourable outcomes. The consistency assumption is similar in that it asserts that the higher the degree of relatedness within a given profile, the more predictable the favourable outcomes. The identity assumption adds that clearer and more stable identity again leads to higher probability of favourable outcomes.

The last three assumptions--differentiation, consistency, and identity--are three ways of "defining the clarity, focus, or definition of a person or environment. They are positively correlated and intellectually similar" (Holland, 1985, p. 51). Differentiation and consistency are indirect measures, calculated from interest inventory profiles, while identity is a direct measure, typically measured through a self-report questionnaire (Holland). People with clear identities "are expected to be 'good' decision makers because of the implications of differentiation and consistency: integration of preferred activities, competencies, occupational preferences and self-estimates" (Holland & Gottfredson, 1976, p. 21). They know what vocation they would like, and hence are able to find it. On the other hand, the "poorly-defined type is expected to move between dissimilar jobs because he/she has incorporated diffuse personal characteristics, or because no clear patterning of characteristics has developed" (Holland & Gottfredson, p. 21). A study of 1697 high school and college students gives support to these propositions: Holland and Holland (1977) found the largest difference between the vocationally decided and undecided was in degree of identity.

Evidence for the predictive validity of differentiation, consistency, and identity is "checkered" (Holland, 1985). Unfortunately, many studies utilized small sample sizes or poor designs. Holland recommended that certain moderator variables be controlled. Level of education, which is strongly related to prestige, intelligence, and social class can skew results, as can age and gender. Nevertheless, some well-designed studies have found evidence that the concepts of differentiation, consistency, and identity are valid.

A similarity exists between the concepts of differentiation, consistency, and identity and that of multipotentiality. The undifferentiated, inconsistent person who lacks identity, seems to describe the multipotentialed individual. At least the parallel exists for the gifted (whose ability can be assumed) when one's Holland profile is elevated, indicating a variety of strong interests. Swanson and Hansen (1986) distinguished between two types of flat profiles--high-score undifferentiated (HSU) and low-score undifferentiated (LSU). While the LSU group has weak interests, the HSU group has a variety of strong interests. The HSU group was also found to have a higher grade point average (GPA) and Academic Comfort score on the Strong Interest Inventory (Hansen & Campbell, 1985) than the LSU group, indicating ability, as well as broad interests. It appears that a good way to identify multipotentialed individuals is to look for those with HSU interest inventory profiles. Thus the same interest inventories which are used to implement Holland's theory could arguably be used to operationalize multipotentiality.

One such popular inventory is the Strong Interest Inventory (Hansen & Campbell, 1985). The accompanying users' guide, compiled by Hansen (1992), speaks of flat, elevated profiles being due either to a failure of the testee to respond in the negative to items on the inventory, or to one having a large diversity of interests. Such "elevated profiles may reflect the multipotentiality of clients" (Hansen, p. 56). This flat, elevated profile would be interpreted, according to Holland's (1985) theory, as that belonging to an undifferentiated, inconsistent individual who lacked identity. The study of multipotentiality, via Holland's theory, does not however require the utilization of all three identity concepts. As Holland rates differentiation as more important than consistency or identity, at least at this time, and as differentiation is "concerned more with the range of scores in the whole profile" (Holland, p. 26), it seems that the concept of differentiation is best suited to the task of identifying and studying multipotentialed individuals.

Differentiation increases with age and experience. Through exposure to activities, interests and competencies develop, and one comes to better know oneself (Holland, 1985). The differentiated resemble a single type--they have a very well-defined, peaked profile. The undifferentiated person "resembles each type to the same degree" (Holland, p. 26). The profile is flat, and educational and vocational actions are not easily predicted. Holland obtains a measure of differentiation from interest inventories by subtracting the lowest type score from the highest type score (X1-X6). The higher the value obtained from this differentiation index, the higher is one's degree of differentiation. Evidence that differentiation, or rather the lack thereof, can negatively impact career decision-making

comes from findings that more clients seeking vocational aid are undifferentiated than are members of a comparable reference group (Wigington, 1983).

Other evidence that exists regarding the effects of differentiation has to do with educational and vocational decision-making ability, satisfaction, stability, and achievement--those things which Holland (1985) postulated differentiation levels to help predict. As was already mentioned, such evidence is checkered (Holland). One large-scale study ($N = 1837$) found differentiation level to be predictive of vocational decision-making (Holland, Gottfredson, & Nafziger, 1975). Investigative types were also found to be the best decision-makers while Conventional types were the worst. No such relationship between differentiation and decision-making was found in other studies however (Alvi, Khan, & Kirkwood, 1990; Erwin, 1987; Lowe, 1981; Slaney, 1980). Likewise, no relationship was found between differentiation and career maturity (Guthrie & Herman, 1982). In fact, these researchers found the highest vocational maturity scores for the congruent, undifferentiated group.

Differentiation was found to predict job satisfaction in teachers (Wiggins, Lederer, Salkowe, & Rye, 1983) and school counsellors (Wiggins, 1984). It was not found to be predictive of job satisfaction for college students (Nafziger, Holland, & Gottfredson, 1975), nurses (Heydman, 1987), or bank tellers (Gottfredson & Holland, 1990). Perhaps differentiation is beneficial for some types, but not for others. Perhaps differentiation only becomes a determinant of job satisfaction when one is in a job congruent with one's personality type. Swaney and Prediger (1985) found differentiation to predict job satisfaction in congruent young workers. Peiser and Meir (1978) likewise found differentiation and congruence to predict satisfaction for grade 12 males, but not for females. Contradictory evidence was found, however, by Hener and Meir (1981): While differentiation alone predicted job satisfaction for nurses, differentiation and congruence together did not. Carson and Mowsesian (1993) found that neither differentiation alone nor differentiation and congruence together predicted the job satisfaction of employed adults.

A large-scale study ($N = 890$) conducted by Taylor, Kelso, Longthorp, and Pattison (1980) found differentiation to predict stability of vocational choice in college males, but not in females. No relationship at all was found by other researchers (Heydman, 1987; Peiser & Meir, 1978; Rose & Elton, 1982; Villwock, Schnitzen, & Carboni, 1976).

Evidence for the ability of differentiation to predict achievement is also inconclusive. Differentiation was found to predict achievement on English and Social

Studies aptitude tests (Erwin, 1987) but not in nursing school (Heydman, 1987). O'Neil (1977) found differentiation to predict Scholastic Achievement Test (SAT) scores, but not GPAs. Reuterfors, Schneider, and Overton (1979) found differentiation to predict GPA in males, but not females. While differentiation alone was not predictive of graduate school achievement, it became so in combination with congruence (Frantz & Walsh, 1972).

Schwartz (1991) postulated that a confounding variable--Achievement-Orientation of Personality Type (AOPT)--nullifies the results and conclusions of many such studies. Schwartz wrote that some types are more achievement-oriented than are other types, and he cites research which provides support for this hypothesis. Holland (1985) concurred that different personality types seek different levels of educational achievement--I, S, A, C, E, R--and vocational achievement--E, S, A, I, C, R (both given in descending order of importance). In the previously cited studies on differentiation and achievement, it may actually be AOPT which predicted achievement outcomes rather than differentiation.

Similar controversy has also occurred with regard to the index used to measure differentiation. Hener and Meir (1981) wrote that the traditional index proposed by Holland (1985), X1-X6, does not take all facets of differentiation into account as it only utilizes the highest and lowest type scores. They called for a more accurate definition and measure of differentiation. Holland's index has been compared to four other differentiation indices, each of which takes different type scores into account (Alvi et al., 1990). Two of the indices were developed by Iachan (1984a): 1/2[X1-(X2-X4)/2] and 1/3[X1-(X3-X5)/2]; one by Spokane and Walsh (1978): X1-X3; and one by Frantz and Walsh (1972): X1-X2. While all five indices were related, the two Iachan (1984a) indices and the one developed by Spokane and Walsh were the most highly correlated. Alvi et al. recommended the use of the more complex Iachan indices since they take more of the type scores into consideration. Little research has yet been done with these new differentiation indices, however. Perhaps, "there may be no *one* correct way to compute differentiation. Conceivably, each of the various indices assesses a different facet of differentiation" (Monahan, 1987, p. 225).

Holland's (1985) concept of differentiation has to do with how closely one resembles a single type without having competing influences from the other types. Thus a differentiated person would strongly resemble one type and only weakly resemble the other five types; the undifferentiated person would resemble several different types fairly equally. This concept needs to be operationalized: However differentiation is measured should reflect Holland's conception of differentiation. While Holland conceptualized differentiation quite clearly, he does not seem to have operationalized it very well. A

better way of measuring differentiation is needed.

The concept of diversity seems to be very closely related to that of differentiation. Diversity can refer to a large number of interests or to interests which, while not necessarily numerous, are unrelated (Gaeddert & Hansen, 1993). Thus the differentiated individual would be characterized by low diversity of interests and the undifferentiated individual would be characterized by high diversity of interests. This provides an additional means of calculating differentiation. As well, if one can assume the ability implied by multipotentiality, one can also measure multipotentiality through the concept of diversity of interests.

Such a measure was developed and found, when compared to six other measures of diversity, to be the best predictor of diversity of interests next to self-rating (Gaeddert & Hansen, 1993). This measure of diversity takes into account intensity of interests by comparing scores on the General Occupational Theme (GOT) scale of the Strong Interest Inventory (Hansen & Campbell, 1985). Profile comments which describe GOT scores rate interests as very high, high, moderately high, average, moderately low, low, and very low. By definition, high diversity individuals have 4-6 GOT scores in the moderately high to very high range and low diversity individuals have only 1 of 6 GOT scores in this range (Gaeddert & Hansen). This measure of diversity would appear to be a valid measure of differentiation, as well as of multipotentiality.

Further research can put this new measure to the test. It can also seek to clarify the effects of differentiation. Is the lack of positive evidence for Holland's (1985) predictions due to problems with the measure or with the concept itself? Perhaps values and needs, which Holland neglects in his theory, play a rather large role in career decision-making and need to be taken into account. Perhaps the checkered results (Holland) are an indication that multipotentiality (as measured by differentiation) has different effects on different individuals. Case studies could help to isolate what variables may be acting as moderators and affecting the multipotentialed individual's career decision-making. No doubt many such variables interact in this complex issue.

Possible Moderator Variables

The two bodies of literature under consideration have been examined for what light they can shed on the phenomenon of multipotentiality. Both of these fields suggest possible moderator variables which could influence the effects of multipotentiality on career decision-making. Suggestions to help overcome the problems related to multipotentiality are given. Unfortunately more theorizing than actual research has been

done to date, but at least future research has been given its starting point.

Psychology of Giftedness

The myth that the future of gifted individuals is assured and that they do not need any sort of career guidance has largely been put to rest (Berger, 1989).

> The overall need of the gifted . . . for career education is strongly endorsed, as well as the need for some differentiation of that component . . . . The most important element distinguishing gifted children are their multiple interests (which make decisions harder) and their competence (which opens additional and rare work opportunities). (Shore et al., 1991, p. 133)

Multipotentiality is now recognized as a "real" problem. Yet while many practitioners and theorists consider career education for the gifted to be a top priority, they also feel that this need is not being satisfactorily met (Milgram, 1991): "Too often, multipotential students make misinformed, misguided, or just plain wrong career choices" (Kerr, 1991, p. 86); "Potentiality frequently lies fallow" (Herr, 1976, p. 99).

As with other students, "career guidance [is needed] early in life to help them recognize their capabilities, clarify their interests, and expose them to the range of possibilities that await them" (Silverman, 1993, p. 215). But this guidance must be specially tailored for the gifted--or more specifically, in this case, for the multipotentialed. Prevention can be useful: Discuss "the internal and external clashes that exist when attempting to select one career when many are possible" (Delisle, 1982, p. 11) and "recognize multipotentiality as the *mixed blessing* that it can sometimes be" (Delisle, 1982, p. 9).

> A career counseling process which supports the notion of multipotentiality will be better able to help gifted students learn to expect change in their careers and anticipate the need to develop other abilities. In this way individuals will be able to control their own career plan and direction. (Fredrickson, 1979, p. 270)

If those involved are "informed of the possibility of late blooming and helped to understand that career decisions are not irreversible, some of the struggle around career choices can be lessened" (Silverman, p. 223).

Career education and guidance should begin as early as elementary school (for suggested age-related interventions, see Kerr, 1991, pp. 92-93). It can then continue as "an on-going process which is influenced by significant others within the family, school, work setting, and community" (Delisle & Squires, 1989, p. 100). The goal should not be early career choice (Kerr, 1991), but rather identification of a general field of interest (Terman & Oden, 1954). Yet, as somewhat of a contradiction, it is necessary that "conscientious attempts be made to encourage gifted and talented persons to make occupational decisions" (Sanborn, 1974, p. 147). Continued growth in career education is

desired, rather than procrastination or stagnation (Kerr, 1991). As an aid, "to the extent that gifted youth can be helped to view career decision-making as an ongoing process rather than a one-time choice . . . they may more easily be able to make career decisions at any given point in time" (Emmett & Minor, 1993, p. 363).

Career decisions are based on knowledge of oneself and knowledge of careers. In the career-guidance field, the traditional sources of self-knowledge utilized are interests and abilities. Unfortunately for the multipotentialed, interests and abilities are numerous and "the majority of interest and aptitude tests . . . lack the sensitivity needed to discriminate among very strong interests and very high abilities" (Kerr, 1981b, p. 319). One multipotentialed girl described the results of a computer-based self-assessment: "I got a computer printout, which was supposed to select the ideal job. It said 'Cut off after 80, 127 remaining.' I was supposed to select four" (Freeman, 1991, p. 146). Abilities and interests often do not help to narrow the career options of the gifted.

Attention to interests and abilities alone is often not sufficient grounds upon which the multipotentialed can base career choice. Further self-exploration is required. Personal values are very important to vocational selection: "Personal and humanitarian relevancy are often the key value considerations evidenced in the career development processes of talented students" (Perrone & Van Den Heuvel, 1981, p. 301). Interviews and self-image questionnaires given to 60 gifted grade 12 students found that they sought lifelong careers that allowed for creativity and self-expression (Leroux, 1986). Thus the gifted must "consider a life style which will permit them to continue raising personally meaningful questions throughout their lives" (Perrone & Van Den Heuvel, p. 302); "in order for them to be happy with their work, they must be constantly stimulated, challenged, and learning" (Silverman, 1993, p. 223). The gifted often feel the need to contribute to society as well (Jepsen, 1979).

For such reasons, "gifted students need opportunities to think in terms of what it means for a multipotentialed individual to have a job . . . . A multitude of interests and skills could be the cause of boredom or forms of job dissatisfaction" (Rodenstein et al., 1977, p. 344). The multipotentialed must "consider vocations that have potential for extensive *growth* . . . . the kinds of careers that will be sufficiently open-ended to permit students to be continually challenged and to grow" (Davis & Rimm, 1989, p. 138). Long-term goal setting is required (Kerr, 1991) and one's desired lifestyle must be considered: For example, "choosing a lifestyle which can provide meaning and direction in their lives" (Phelps, 1991, p. 141). In order to do this, the multipotentialed individual needs to "learn self-assessment skills and exploration skills" (Kerr, 1981a, p. 7). The multipotentialed

must not "feel compelled to stay within the channel marked for them by society's expectations" (Simpson & Kaufmann, 1981, p. 44).

Due to multipotentiality, "many academically talented college students have a scattered, diffuse identity" (Kerr & Erb, 1991, p. 309). Chickering (1969) wrote that the central developmental task of college-age students is to establish their identity, but this can be difficult when one is as complex in nature as are the multipotentialed. Such difficulty is then compounded when one's development of purpose (Chickering) becomes waylaid: "only when a strong sense of identity has been formed can these gifted women [and men] choose and act on career aspirations commensurate with their abilities, interests, values, and needs" (Phelps, 1991, p. 141). As pointed out, "theorists throughout the history of gifted education have stressed the importance of the development of a sense of purpose and the need for a meaningful identity" (Kerr & Erb, p. 309). These tasks can be especially difficult for the multipotentialed female in our society who tries to combine both a career and family: Career dissatisfaction can result from such failed compromises (Watley & Kaplan, 1970).

Recently, Kerr and Erb (1991) studied the effects of a values-based intervention on the identity and development of purpose of 41 university honours students who, when asked, requested career counselling. The participants were told that the focus of such counselling was to help the multipotentialed make career decisions based on values. Social influence techniques were used to emphasize the importance of values, while several values-based interventions were administered and interpreted. Significant differences in pre- and post-test scores on the Identity-Confidence and Development of Purpose-Vocational subscales of the Student Development Inventory (Hood, 1986) were found in the expected direction. Half of the subjects changed their majors, and while there was no change in the measured certainty of major, there was an increase in the measured certainty of occupation.

A second study found similar results. This time 37 university honours students were asked to participate in a career counselling study. The same interventions as before were administered to 19 subjects in the treatment group, while 18 wait-list subjects completed only the pre- and post-tests. Scores on the Identity-Confidence subscale improved for the treatment group but not the control group. There was no significant difference in scores on the Development of Purpose-Vocational subscale between the two groups, although both groups did improve over the course of the study. Taken together, these results support the notion of values-based career guidance as an aid to career decision-making. It is interesting to note, however, that in both studies the pre-test

measures of identity and purpose are more positive than expected norms. These honours students did not seem to be lacking in identity or purpose.

Other counselling interventions have also had success with gifted students. For instance, a one-day guidance laboratory was found to be an effective intervention for multipotentiality (Kerr & Ghrist-Priebe, 1988). In this study 56 gifted high school seniors received treatment, while 31 were placed on a waiting list. The subjects in the treatment group completed interest and value inventories, then visited a university campus and attended the class of their choice. Each subject had a 50-minute individual counselling session where tests were interpreted, goals set, and continued decision-making emphasized. Next, counsellor-led group life-planning sessions were held and future lifestyles, barriers, and ways to reach goals were discussed. A final lecture to encourage continued career decision-making ended the career workshop. Follow-up two months later found the treatment group talking about careers and visiting counsellors more than the control group. A full 100% of the treatment group believed the intervention to be helpful (31% changed career plans and 38% confirmed career plans) and all were working towards their goals.

Thus it appears that client-centred counsellor interventions can be of much use to the multipotentialed student. In fact, the gifted have been found to rate career education as the most positive part of their school experience (Colson, 1980). One study found a trend for the gifted to prefer structured rather than unstructured counselling (Kerr, 1986). Support can help to alleviate the anxiety that comes from uncertainty (Perrone & Van Den Heuvel, 1981). It has been suggested that in order "to better meet the career development needs of these students, we may have to place more emphasis on understanding the career-decision-making process and arising anxieties than on the career choice itself" (Marshall, 1981, p. 309).

> In some instances, these youth need the reassurance that there is nothing tragic about not being able to make up one's mind in high school. They also need to understand that one learns more quickly what one does not want to do, than what one does want to do. (Herr, 1976, p. 101)

Multipotentialed students "need assurance that their multipotentiality is an asset rather than a liability and reassurance that lack of early specialization does not mark them as washouts for life" (Silverman, 1993, p. 220).

Such support can also come from peers and help multipotentialed individuals know that they are not alone with their worries. Sharing concerns and feelings in group discussions is a valuable experience (Perrone & Male, 1981). Same-sex groups have been found to be preferred by both sexes (Kerr, 1986). A "non-judgemental, open-ended

environment" (Simpson & Kaufmann, 1981, p. 43) can help the multipotentialed to explore various career options and ways of overcoming career indecision can be shared.

Multipotentialed students can also be helped to think about the concept of "career" in broader terms. One's "calling" or vocation need not be one's livelihood (Silverman, 1993). One can always earn a living by means of a job, but derive one's true pleasure from interests pursued in one's free time (Ehrlich, 1982). One can also consider the "possibility of serial or concurrent careers" (Silverman, p. 221). The multipotentialed "have a greater capacity for adaptability" (Fredrickson, 1979, p. 270), so changing careers is both conceivable and permissable.

> The multipotential . . . are seemingly able to either follow their original choice or change to other choices. A concept of multipotentiality would help the individual to anticipate this change and recognize it not as a failure to measure up to the requirements of a previous choice, but an awareness of the plasticity of man to adapt to his changing world of work. (Fredrickson, 1972, p. 73)

One's career strategy and one's strategy for creative growth need not be identical. Rather, one's job may compliment one's lifestyle path (Willings, 1983).

Leisure activities very often play a large role in the life of a multipotentialed individual. They can "serve as an early and continuing natural laboratory" (Milgram, 1991, p. 132) where interests are explored and prioritized: Those leisure activities pursued by adolescents are thought to be valid predictors of adult occupational choice (Milgram & Hong, 1993). Links between particularly fulfilling leisure activities and possible careers can be sought (Davis & Rimm, 1989; Simpson & Kaufmann, 1981). Perhaps it would be possible to personalize a career "based on a composite of their talents" (Roper & Berry, 1986, p. 52). But as the multipotentialed "probably will not find an occupation which uses all of their talents" (Fredrickson, 1986, p. 557), leisure activities can help to supplement one's career and provide for expression of a variety of interests (Roper & Berry).

> Since any given career pattern may be capable of meeting only some of the multiple interests held, it is necessary for students to decide upon those interests which will be pursued in career and those for which outlets might be found in avocational or other pursuits. (Herr & Watanabe, 1979, p. 254)

The multipotentialed individual must remember that "*Having it all* is not impossible, but *having it all, all the time* sometimes is!" (Hollinger, 1991, p. 137).

Often the multipotentialed lack adult role models who can help them to envision future possibilities (Gowan, 1960). Many successful gifted adults cite mentors as highly valuable to their development (for example, see Bloom, 1985): "Mentors who have managed to develop and utilize a variety of talents and interests can encourage these

students to understand that career decision-making need not be a narrowing process" (Marshall, 1981, p. 309). Mentors, as well as providing exposure to various career fields, can help younger students to see how career and lifestyle can be combined, and satisfaction achieved. In a review of the literature on mentorship, Edlind and Haensly (1985) found multiple benefits to exist.

A variety of other adult role models can also inspire the multipotentialed in the career decision-making process. Guest speakers and biographies can give the multipotentialed person a first-hand look into a life of success (Kerr, 1991). Ways of harnessing the benefits of multipotentiality can be shared (Delisle, 1982). Exposure to unusual careers and the careers of women and minorities can also be enlightening (Delisle & Squires, 1989). More direct career information can be achieved via interviews, shadowing experiences, internships, or work experience (Herr & Watanabe, 1979). Many recommend hands-on, experiential learning (Kerr, 1981b; Milgram,1991; Silverman, 1993) such as "shadowing" an adult worker, visiting university classes, participating in an internship, or volunteering (Kerr, 1991). But Marshall (1981) warned that it "offers no magic solution, either" (p. 308), as the multipotentialed person could spend endless amounts of time in such pursuits and still be no closer to deciding upon a career. Intuitively though, such experiences ought to be beneficial, provided they were tempered with a little structure: "Exposure . . . will help gifted youth distinguish between their interests in academic subject matter and their desire to apply that knowledge in specific career fields" (Emmett & Minor, 1993, p. 364). Such exploration can help the individual to apply their "book knowledge" to "real life" (Miller, 1981).

The multipotentialed individual can also look to the future, fantasize about potential careers (Kerr, 1991), and try to anticipate jobs that will be needed (Perrone & Van Den Heuvel, 1981). Careers may be "created" if the need exists (Miller, 1981; Sanborn, 1974; Silverman, 1989). Although Perrone and Van Den Heuvel recommend this as a possibility, they also cite evidence from follow-up studies done by Perrone and Post in 1981, at the University of Wisconsin's Research and Guidance Laboratory, that this does not happen. What does happen is that students pursue careers either in areas of scholastic achievement or in areas in which favourite teachers were found: "It appears that the need to reduce internal dissonance inhibits talented students' potential for creative integrated career development" (Perrone & Van Den Heuvel, p. 301).

Decision-making can always be delayed while keeping options open, until more evidence swings the balance in favour of a particular career.

When gifted students find it difficult to determine which path to follow, it is wise

> to allow them extra time in which to make their career choices and to give them a broad enough educational base so that later they can move in several different directions. (Silverman, 1993, p. 223)

Of course a balance must be maintained, via the previous recommendations, so that chronic career indecision does not result. In order to learn more about the effects of multipotentiality and how to turn it to one's best advantage, studying the successful has been recommended:

> Some gifted youth make career decisions with relative ease. Case studies of these gifted youth might provide valuable insight into what best facilitates the career development process in those gifted youth who need such help and whose lives and work offer such potential contribution to the lives and work of us all. (Emmett & Minor, 1993, pp. 364-365)

Psychology of Career Development

"Thinking multipotentiality" was recommended by Pask-McCartney and Salomone (1988). Realization that decision-making will be complex and often frustrating can help one to anticipate problems. Premature decision-making will need to be avoided, as the career-selection process may take quite a long time. Much self-exploration is needed, rather than the simple collecting of vocational information. Values will need to be clarified as identity and lifestyle preferences are explored. While experience in the world of work can be useful, imagining oneself in the future is the most highly recommended prescription. A counsellor will need to provide a lot of support and acceptance, as well as help maintain the balances between fantasy-reality and freedom-structure. Careers with multipotential can be considered, and leisure activities may provide an outlet for those interests not satisfied in a particular career (Pask-McCartney & Salomone, 1988).

According to Holland (1985), differentiation increases with age and experience. Through exposure one comes to know oneself better. Career exploration was found to increase congruence, and hence vocational satisfaction would be expected to increase as well (Grotevant, Cooper, & Kramer, 1986). It is the lack of experience which results in ambiguous flat interest inventory profiles. Thus Holland would recommend that the multipotentialed individual be very active in exploring and experiencing a variety of occupations, in order to determine primary interests. It was suggested that "making choices under any circumstance may be more constructive in the long run than postponement because choices lead to involvement, learning, and responsibility" (Holland & Gottfredson, 1976, p. 26).

Recommendations for the multipotentialed client are found in the *User's Guide for the Strong Interest Inventory* (Hansen, 1992): have a variety of leisure activities, make

friends who have a wide variety of interests, seek employment with those who have diverse interests, or change occupations periodically. Those who have opposing fields of interest are also advised to select one group of interests to be satisfied in an occupation and another group of interests to be satisfied avocationally, perform one type of activity in the opposing environment, or mold one's job to combine the varied interests.

Certain variables are also expected to influence multipotentiality. Type may play a role in the development of multipotentiality, as certain types--A, I, S, E, R, C (in descending order of importance)--are thought to be more creative and open to experience than other types (Holland, 1985). Investigative types may "be reluctant to make choices that may limit future options" (Hansen, 1992, p. 16), since they frequently experience much success for their endeavors, so perhaps they will experience more problems with multipotentiality. Perhaps the different types employ different decision-making strategies (York & Tinsley, 1986), and some of these strategies are better suited to deal with multipotentiality than others.

Other variables may be associated with multipotentiality and affect its development and resolution. Perhaps extraversion is closely related to multipotentiality (Gaeddert & Hansen, 1993), and hence increased introspection could help to focus interests. Holland (1985) has stated that age will bring with it increased differentiation, and hence decrease the problems of multipotentiality. What about the other moderator variables Holland speaks of, such as gender, race, educational level, intelligence, social class, and occupational prestige? What effects do these variables have on multipotentiality? Further research is needed, both to see how multipotentiality develops and to see how best to help the multipotentialed individual make career choices.

Conclusion

Two bodies of literature--that of giftedness and career psychology--to varying degrees discuss the concept of multipotentiality. Little, if any, attempt to link these literatures has been made thus far. This literature review represents a start at such an integration. No doubt other fields of inquiry will also be able to add to the understanding of multipotentiality.

By far, most work on multipotentiality has been done by researchers interested in giftedness. Such research has much to offer to the more "mainstream" field of career psychology, and Holland's (1985) theory of vocational choice in particular. Such connections are called for by Jackson (1993) who discusses the multiple benefits of integrating giftedness research into mainstream research. In this case, links would likely

benefit both parties. The field of giftedness could gain structure from the more established career psychology field and the career psychology field could gain depth from the case study analyses done in the field of giftedness. For it is the giftedness field which personalizes the concept of multipotentiality: why multipotentiality occurs, what consequences are likely, and what remedies are possible. Much of what is known about multipotentiality in the gifted comes from case studies. This knowledge can provide a starting point for the more structured and scientific research which occurs in the more mainstream field of career psychology.

The gifted are an excellent population with which to study multipotentiality, since they are frequently defined as such. Vocational interest inventories can pinpoint areas of interest, and ability can be assumed, thus providing a concrete measure of multipotentiality. Study of those multipotentialed individuals who are successful at career choice, as compared to those who are chronically undecided and dissatisfied, can help clarify the process of effective career decision-making. Such knowledge would be of much benefit to those working with multipotentialed students and clients in need of career guidance.

Research Questions

The purpose of this study is to twofold: To further explore the concept of multipotentiality in an effort to clarify its meaning and usage and to try to identify factors which moderate the relationship between multipotentiality and "successful" career decision-making. Answers, or at least indications of such, to four main questions are sought.

First, does the present sample of gifted youth show signs of multipotentiality? What percentage of this sample seem to be multipotentialed? When does multipotentiality first appear and is it a stable characteristic? Can the Strong Interest Inventory (Hansen & Campbell, 1985) be utilized as a means of identifying multipotentialed individuals?

Second, what exactly is multipotentiality? Are the descriptors of multipotentiality found in the giftedness literature confirmed? Does multipotentiality encompass multiple abilities or multiple interests or both? Do motivation or opportunity play a role? Does multipotentiality occur in the vocational or avocational realm, or both? Can any new light be shed on this concept?

Third, is multipotentiality an asset or a liability? Does multipotentiality lead to difficult career decision-making? Does it lead to anxiety or dissatisfaction? What percentage of multipotentialed individuals suffer ill-effects, and how does this compare to

the rate of suffering in nonmultipotentialed individuals?

Fourth, why are some multipotentialed individuals "successful" in their career decision-making, while others are less so? What moderates the relationship between multipotentiality and success?

CHAPTER 2: METHOD

Procedure

This nine-year follow-up study required making contact with and gathering further data from a pool of 247 previously studied subjects who had attended one of two gifted summer school programs in 1984. Prior to recontact, a telephone interview and a packet of questionnaires were assembled. As this was somewhat of a team follow-up study, other investigators also included items required for separate studies, in both the telephone interview and mailed questionnaire.

Contacting the subjects took place over the period of approximately one month. In the effort to recontact the subjects, a variety of sources were tapped: the 1984 McGill Gifted Summer School's records, the 1993 Montreal telephone directory, the subjects' friends and relatives, and the Laurenval School Board (for reasons of confidentiality, contact information was not provided, but the questionnaires were forwarded to the subjects). Every subject was traced so far as the trail existed, and in the end, 180 subjects (73% of the original pool) were recontacted and interviewed.

Each telephone contact involved explaining the purpose for the call and study, and asking for consent to conduct a telephone interview. No one refused, although a few subjects asked to be called back at a later time. The majority of the interviews were conducted by this investigator, although quite a bit of assistance was provided by the other student member of the research team. Due to time constraints and subject requests, a handful of subjects were mailed the telephone interview questions, along with a note explaining the purpose of the study.

Once all of the interviews were completed, each of the 180 subjects was mailed a package containing transmittal and consent forms, the packet of questionnaires, and a self-addressed and stamped return envelope. Within a month, 74 of the 180 questionnaires (41%) were returned completed. At that time, a round of follow-up calls was made and messages left for the subjects to please return the questionnaires. An additional 31 questionnaires (now 59%) came in, over the next month, at which time a third and final round of follow-up calls was made. This brought in six more questionnaires, bringing the total response rate up to 62%, which is quite good, considering that the data collection occurred during final exams and the winter holiday break. Complete 1993/94 data was thus available for 111 subjects and partial data for an additional 69 subjects.

A variety of data gathered in 1984, some of which were never analyzed, were also available to this investigator. These data, as well as the 1993/94 data, were then analyzed

in order to develop a coding scheme prior to the data analysis. After eliminating parts of the telephone interview data as irrelevant, the remaining data were tabulated into the following types of information: identification numbers, demographics and control information, abilities, opportunities, motivation, leisure interests, career interests, multipotentiality, career outcomes, overall outcomes, and potential moderator variables. A copy of the coding form describing how the data were coded can be found in Appendix D. This investigator's coding accuracy was checked by another member of the research team on over 100 randomly-chosen decisions from among those that required judgment, and interrater reliability was found to be 96%. Statistical analysis was then commenced.

Subjects

Participants for this nine-year follow-up study were gathered from a pool of previously studied subjects who had attended one of two gifted summer school programs in 1984. The method of determining eligibility for the two gifted summer school programs differed. Those participants (n = 177) who attended the 1984 McGill-Protestant School Board of Greater Montreal Gifted Summer School were admitted in one of three ways: (a) being in a gifted program at school, (b) being identified as eligible to be in a gifted program, or (c) simply by being recommended by a parent, teacher, or other adult. The participants (n = 70) who attended the 1984 Laurenval School Board Gifted Summer School were admitted in one of two more traditional manners: (a) being selected by their teachers, then scoring at or above the 90th percentile on the Canadian Test of Basic Skills, or (b) being nominated by their parents, then achieving a high IQ score on the WISC-R, then gaining approval from a committee of teachers and psychologists (Shore & Tsiamis, 1986). Numerous measures of intelligence, creativity, locus of control, and self-concept--administered to the subjects in 1984 to determine if the two groups, which had been selected in quite different manners, were comparable--resulted in the conclusion that "there is no important difference between the two groups" (Shore & Tsiamis, p. 96). Thus the 247 participants from the two 1984 gifted summer school programs were treated as a single population, and formed the potential subject pool for this follow-up study.

A total of 180 participants--73% of the original 1984 sample--were recontacted and are included in this study. Most of the other 1984 participants had moved and proved impossible to trace, several were traveling or attending school in Europe, and a few were unreachable for other reasons. Of the 180 subjects who were recontacted and who participated in the telephone interview, a further 111 subjects also returned completed questionnaires (62% of those recontacted). Thus complete 1993/94 data are available for

111 subjects and partial 1993/94 data are available for an additional 69 subjects. The 1984 data used in this study vary in completeness from subject to subject, as certain measures were administered only to subgroups of the entire 1984 sample.

The present sample consists of 110 (61%) males and 70 (39%) females, who range in age from 16-25 years (M = 20.2). Most of the subjects are presently full-time students (88%), and their average Otis-Lennon (Otis & Lennon, 1969) verbal IQ is 124.5. The majority of the subjects come from families in the two highest SES groups (72%), while 20% come from the two middle groups and 8% from the two lowest groups (Blishen & Carroll, 1978; Blishen & McRoberts, 1976). Some "best-guessing" was necessary in order to classify some occupations, thus the SES data are best seen as approximations only. All but one of the subjects are proficient in the English language, which for 84% of the subjects, is their first language. Self-reports of subject ethnicity confound culture, religion, nationality, and race, and thus prove impossible to report accurately: The initial 47 categories required to code this variable (based on "cultural heritage") were reduced to 13, but the aforementioned difficulties still persisted.

Instruments

The collection of 1993/94 data took place in two stages. First subjects were interviewed by telephone, then they were mailed a packet of questionnaires to complete and return. The telephone interview and part of the mailed questionnaire packet consisted of items developed by the present investigator--some of which were retrospective in nature. The mailed questionnaire packet also contained two standardized instruments. As well, the present investigator utilized information which had been collected by previous researchers in 1984. The 1984 data were also gathered from both standardized instruments and materials developed by the previous researchers. All of the data are self-report, except for three brief responses about the subjects, which were provided by their parents in 1984. There is no reason to believe the subjects responded less than honestly, although subjectivity was of course unavoidable. As well, there is the chance that in 1984, due to their young age, some of the subjects may not have taken all of the instruments completely seriously.

1993/94 Data Collection

Telephone interview. Telephone calls--including explanations and the like--ranged in length from 15 to 45 minutes: The average amount of time required for this investigator's questions being approximately 15 minutes. Information required to recontact the subject for a second follow-up at some time in the future was gathered, then

questions developed by this and other researchers were asked. This researcher's items consisted of nine multipart questions relating to career planning (see Appendix B). Basically, the self-report style interview involved asking subjects which career goals they had ever entertained, how they had come to gain and lose interest in those goals, what problems or beneficial experiences related to career planning they had had, and their views on their high school career guidance. As well, subjects were asked to rate, on five-point scales, the difficulty and potential satisfaction of their career decision-making. Some items were eliminated, while the responses to others were coded for later statistical analysis. Specifically, the telephone interview provided data regarding the number of career goals held over time, the occurrence of problems due to multiple choices, as well as the affect surrounding the subjects' career decision-making. These data will help to identify the impact of multipotentiality on career planning. As well, each subject will be classified according to the predominant Holland (1985) type of their present occupational goals (Gottfredson & Holland, 1989), for comparison with their Strong Interest Inventory (Hansen & Campbell, 1985) results.

Mailed questionnaire packet. The mailed questionnaire packet consisted of several parts (see Appendix B): transmittal and consent forms, a sheet gathering basic demographic information, items developed by this investigator, two standardized instruments (described separately), and a stamped and self-addressed return envelope. As well, approximately half of the packets contained items developed by another member of the research team for a second study. The demographic data provided control information regarding subjects' sex, age, ethnicity, level of education, and familial SES. It should be noted, however, that the ethnicity and SES data are confounded and not thought to be highly reliable or valid.

That part of the questionnaire packet which was developed by this investigator consisted of five sections. The first such section asked subjects to rate on four-point scales (from "none" to "lots") their degree of experience with 41 different activities, as well as the degree of subsequent benefit derived for career decision-making from these experiences. Each of the experiences had been recommended by specialists in the field of giftedness, as beneficial to the career decision-making of gifted youth (see Appendix C). These data will be used to see if moderators of career, as well as general satisfaction, can be found--those which lead to successful career decision-making. The next section asked subjects to individually rate their self, career, and life satisfaction on two five-point scales (from "strongly disagree" to "strongly agree") and on one seven-point scale (from "low" to "high"). Summations of these data will be used to separate those subjects whose career

decision-making can be said to be "successful" (that which has resulted in positive outcomes--high levels of satisfaction) from those whose career decision-making has not been as successful (that which has resulted in less positive outcomes--lower satisfaction).

The third section of the questionnaire packet measured breadth of abilities, interests, and opportunities on four-point scales (from "not at all true of me" to "very much true of me"). These data will help to determine which subjects may be multipotentialed and just what characterizes multipotentiality. The fourth section asked for a list of all leisure interests/activities/hobbies that were participated in over the past year, what activities subjects would have liked to participate in over the past year if they had had the time/money/opportunity, and what activities they had ever participated in. Totaling the number of responses to each of the above questions will help to determine which subjects are multipotentialed (those with the broadest activity and motivation levels). The fifth and final section asked the subjects to read a definition of multipotentiality and to rate themselves using this definition now, as well as retrospectively for 1984, on a four-point scale (from "not at all true of me" to "very much true of me"). The definition reads as follows:

> Multipotentiality is the ability and desire to pursue different activities and goals. It is especially evident in the realms of leisure and career decision-making. One may benefit from the effects of multipotentiality, have a variety of 'good' choices, and lead a varied and full life. One may also suffer from the 'overchoice' and find decision-making difficult, as it is not possible to do all that one would like to do and is capable of doing.

This one-item scale of multipotentiality was validated by seven experts who have previously written about multipotentiality in gifted youth (see Appendix C). Elaboration was also requested on how the concept does or does not apply. The purpose of this key section is to determine which subjects are multipotentialed.

My Vocational Situation. The My Vocational Situation (MVS) was one of two standardized instruments included in the mailed questionnaire packet. The MVS (Holland, Daiger, & Power, 1980) is a brief self-report form used to help vocational counsellors to diagnose and thus select appropriate interventions for clients seeking career counselling. It consists of three sets of items--those measuring vocational identity, the need for occupational information, and perceived barriers. The Vocational Identity (VI) Scale consists of 18 true-false items. Each false response adds one point to the total score--the higher the score, the more clear and stable is one's vocational identity. The Occupational Information Scale consists of four items scored in the same manner as the previous scale and measures one's need for further vocational information. The Barriers Scale also

consists of four items, scored as before, and measures perceived external obstacles to one's chosen vocational goal. As well, at the top of the questionnaire, respondents are asked to list all of the vocations that they are presently considering; and at the bottom of the questionnaire space is left for the respondent to add comments or concerns.

The internal consistency (KR 20) of the VI Scale is high: It has been found to range from .86 to .89. That of the Occupational Information and Barriers Scales is lower--ranging from .23 to .79--hence these two scales resemble checklists (Holland et al., 1980). Test-retest reliability for the VI Scale is approximately .75 for intervals between 1-3 months (Holland, Johnston, & Asama, 1993). The VI Scale and the Career Decision Scale (Osipow et al., 1976) have been positively correlated at .65 (Holland et al., 1993). Over 50 investigations have found VI Scale scores to correlate with such things as positive vocational attitudes and beliefs, rational career decision-making styles, decisiveness, commitment, hopefulness, confidence, and control. Low scores have been correlated with such things as negative attitudes, low self-esteem, diffuse identity, and hopelessness. Thus it appears that the VI Scale provides a general measure of psychological health (Holland et al., 1993).

For the purposes of this study, the VI Scale will be used as an outcome measure to separate those subjects whose vocational decision-making is "successful" from those less successful. High scorers will have clear and stable pictures of their vocational identity, and hence "relatively untroubled decision-making and confidence in one's ability to make good decisions in the face of inevitable environmental ambiguities" (Holland et al., 1980, p. 1). As well, the responses to items #2 ("I am concerned that my present interests may change over the years") and #14 ("I would like to increase the number of occupations I could consider") with be correlated with multipotentiality.

Strong Interest Inventory. The second standardized instrument included in the mailed questionnaire packet was the Strong Interest Inventory (SII) (Hansen & Campbell, 1985). This measure was developed in 1927 by E. K. Strong Jr. as a way to identify the vocational interests--not abilities--of men and women. Over the years the instrument has evolved, and is now organized with respect to the six Holland (1985) vocational personality types. The instrument consists of 325 items written at the sixth grade reading level, and takes less than 30 minutes to complete. This study used the combined question and answer booklet, where subjects darken the appropriate answer "bubble" adjacent to each question. Later this investigator entered the responses onto a computer disk for computer-scoring. The first 281 items require a "like," "indifferent," or "dislike" response to 131 occupations, 36 school subjects, 51 activities, 39 leisure activities, and 24 types of

people. The next 30 items require a "left," "the same," or "right" response to pairs of activities. The last 14 items require a "yes," "unsure," or "no" response to personal characteristics. Variety in question format is used to keep the respondents' interest, while somewhat redundant items are completed.

Three main types of information are tabulated with aid of a computer-scoring program. Six General Occupational Themes (GOT)--corresponding to the six Holland (1985) types--show one's overall occupational orientation. For each scale, one receives one's standardized score, as well as a percentile ranking for one's own sex, reported on a seven-point comment scale (from "very similar" to "very dissimilar"). The Basic Interest Scales (BIS) measure the consistency of one's interests and provide more detail than the GOT, again within the Holland framework. For each of the 23 BIS, one receives a standardized score and one of the same seven comments. Scores on the BIS are found to increase after about age 16, and workers employed in one of the specified occupations are found to score one standard deviation above the mean for that particular scale. The Occupational Scales (OS) measure the degree of similarity between one's own interest pattern (likes and dislikes) and those of people actually employed in the specified occupations. For each of the 207 scales, one receives one's standard score for one's own and the opposite sex.

The SII also provides a variety of other information calculated by the computer-scoring program. Up to 20 missed responses does not present a problem, but an unusual number of infrequent responses does. These data, as well as the percentage of "like," "indifferent," and "dislike" responses for each part and overall, is reported. A measure of introversion and extraversion, as well as one of academic comfort (related to how much education one is likely to pursue), is also calculated.

Interests begin to solidify around age 17, and by age 25 are found to be quite stable (Hansen & Campbell, 1985). As most research involving the SII has been done with subjects over age 17, the psychometric properties of the SII apply only to this population. The test-retest reliability of the three scales is quite high. After two weeks, test-retest reliability for a sample of 180 subjects having a mean age of 18.7 years, was .91 for the GOT, .91 for the BIS, and .92 for the OS. After three years, the test-retest reliability for a sample of 40 adults was .81 for the GOT, .82 for the BIS, and .87 for the OS (Hansen & Campbell). Within the GOT, intercorrelations between each of the six types decreases as theoretical relatedness decreases. Scores on the GOT and BIS--both homogenous scales--are generally quite consistent; as are the scores from the heterogeneous OS. Face validity for the GOT and BIS is high. Concurrent validity as

measured by the scores of known types employed in appropriate occupations (for example, an Investigative type employed as a research scientist should score high on the Investigative scale and the scientific research worker occupation), is also good: Different types and occupations obtain a reasonable spread. As well, avocational interests are congruent with GOT scores. Predictive validity is lower, but nevertheless can be good, especially if subjects' scores are internally consistent (Hansen & Campbell).

For the purposes of this study, data from the SII will provide two main types of information. First a measure of the subjects' Holland (1985) type will be obtained by ranking the GOT standardized scores. Second, nine different measures of interest diversity will be obtained: (a) the degree of relatedness between the two highest GOT scores, where the lower the consistency (Holland), the greater the diversity; (b) the percentage of "like" responses given to the 131 listed occupations, where the greater percentage indicates greater diversity; (c) the percentage of "like" responses given to the 36 listed school subjects, also where the greater percentage indicates greater diversity; (d) the percentage of "like" responses given to the 39 listed leisure activities, again where the greater percentage indicates greater diversity; (e) the number of GOT scores in the "moderately high" to "very high" range, where 1 such score indicates low diversity and 4-6 such scores indicate high diversity (Gaeddert & Hansen, 1993); (f) the number of BIS scores in the same range, where the greater number indicates greater diversity; (g) the number of Holland categories in which there are OS scores of 40 or greater (Gaeddert & Hansen), where the greater number indicates greater diversity; (h) differentiation as measured by Holland, where low differentiation corresponds to high interest diversity; and (i) differentiation as measured by Iachan (1984a), again where low diversity corresponds to high interest diversity.

1984 Data Collection

Strong Interest Inventory. In 1984, 103 of the subjects utilized in the present study were given the 1981 version of the SII (Hansen & Campbell, 1985). In this version there were only 162 OS, in which fewer nonprofessional occupations were included. As well, an earlier reference group was used for the norming. The SII will not be redescribed here, but the fact that in 1984 the subjects were fairly young (ages 8-15 years) is important. The reliability and validity of the SII for this age of subjects is unknown. Hansen and Campbell report the instrument as having been used with subjects as young as 10 years old--subjects who were bright and motivated, as was the present sample. They also report that the profiles of 14 year olds reflect their current interests, but not necessarily their future interests. A comparison of 1984 and 1994 scores may add to what

is known about use of the SII with younger subjects. The same information will also be taken from the 1984 data as from the 1994 data, to try to paint a picture of multipotentiality over time.

Otis-Lennon Mental Ability Test. The Otis-Lennon Mental Ability Test (Otis & Lennon, 1969) is a 50 minute group IQ test which measures verbal, numerical, and abstract reasoning, although it is heavily weighted on verbal and academic-educational ability. Form J (Elementary II and Intermediate) was administered to the subjects in 1984. It consists of 80 items arranged in order of increasing difficulty, and results in a single deviation IQ score. Internal consistency ranges from .89 to .94 and test-retest reliabilities range from .87 to .91. Concurrent validity is approximately .60 with both the Stanford-Binet and the Raven's Standard Progressive Matrices (Otis & Lennon, 1969). Since IQ is reported to remain fairly stable (Anastasi, 1988), the measures taken in 1984 will be used in the 1994 study as a control variable and as a possible condition or correlate of multipotentiality.

Raven's Standard Progressive Matrices. The Raven's Standard Progressive Matrices (Raven, Court, & Raven, 1977) is a group IQ test which measures intellectual functioning within the context of "g" via perceptual reasoning. It provides a nonverbal measure of IQ which does not penalize subjects who are economically or culturally disadvantaged. It consists of 60 items, divided into five sets of twelve, which become increasingly more difficult. Each item consists of a black and white matrix which is missing one part that must be chosen from a group of 6-8 choices. Internal consistency ranges from .83 to .97 and test-retest reliability ranges from .55 to .90. Concurrent validity correlations range from .30 to .86 with the Stanford-Binet and Wechsler IQ tests (Raven et al., 1977). The total IQ score derived from the Raven in 1984 will also be used along with the Otis-Lennon IQ score as a control variable and as a potential condition of or correlate to multipotentiality.

Unusual Uses, Consequences, and Repeated Shapes Tests. Three Torrance-style (Torrance, 1974) creativity tests (see Appendix B) were developed by the 1984 researchers to measure divergent thinking (Rejskind, 1987). The Unusual Uses test consists of two items in which subjects are to list as many uses for a common object as possible. The Consequences test consists of two items in which subjects are asked to list all the possible consequences of an improbable situation. The Repeated Shapes test consists of two items--each of which consists of multiple copies of a stimulus (such as a pair of line segments)--in which subjects are asked to draw as many pictures as possible using the stimuli. The two items in each subtest varied in level of familiarity (for purposes

of the earlier studies). The tests were scored for fluency by totaling the number of interpretable and relevant responses. Test-retest reliability of actual Torrance tests range from .42 to .76 (Torrance, 1974). For the purposes of this study, the total score for each subject will serve as a potential correlate to multipotentiality.

Creative Activities Checklist. This 74 item checklist was designed by one of the 1984 researchers (Rejskind, 1984) as a way to measure children's out-of-school creative achievement (see Appendix B). It was based on Hocevar's (1979) Creative Behavior Inventory, and was adapted for use with a younger population. It consists of six subsections--fine arts, crafts, science/math, literature, performing arts, and home activities --each of which is divided with respect to participation (54 items) and recognition (20 items). Each subject's total participation score (number of activities in which participation was indicated) will be used to gain an indication of the diversity of activities participated in by each subject in 1984, in order to help establish each subjects' degree of multipotentiality in 1984.

Children's Science Curiosity Scale. This sixth version of the Children's Science Curiosity Scale consists of 31 items and was developed by Harty and Beall (1984) as a means to measure children's curiosity for science. First subjects are asked to rate their degree of interest in science as "really interested," "do not know," or "not interested." Then subjects are asked to rate each of 30 statements describing scientific interests on a five-point scale (from "strongly disagree" to "strongly agree"). Each of the five possible responses is also illustrated with one or two "faces" which are frowning, neutral, or smiling (see Appendix B). The items are scored in the direction of high curiosity--the scores of the eight negatively stated items are reversed--and scores will range from 30 (low curiosity) to 150 (high curiosity). The alpha coefficient of internal consistency is .84 and test-retest reliability is .68. This scale was found to correlate .64 with the Children's Reactive Curiosity Scale and to discriminate between those subjects who were and were not interested in science (Harty & Beall). Each subject's score will be used as a measure of motivation and will be correlated with multipotentiality.

School Sentiment Index. The School Sentiment Index (SSI) was developed by the Instructional Objectives Exchange (1970) as an informal measure of student attitudes toward the educational environment (see Appendix B). The Intermediate-Level form consists of 75 true-untrue items and each response indicating a favourable attitude towards school receives one point. Five aspects of student attitude are measured through eight subscales: teacher (mode of instruction, authority and control, and interpersonal relationships), learning, school social structure and climate, peer relations, and school in

general. For the purposes of this study, the total score (from 0 to 75), and that of the seven-item (# 27, 34, 42, 48, 57, 63, & 70) attitude-to-learning subscale (from 0 to 7) will be used as measures of motivation and will be correlated with multipotentiality.

Parents' questionnaire. A six-page questionnaire--developed by the 1984 researchers--was previously given to each subject's parents to complete. The part of the questionnaire of interest to this investigator is that dealing with characteristics of the child (see Appendix B). Specifically, three items are of interest: (a) "The child shows great curiosity about his/her surroundings"--rate from 5 (has this trait to a high degree) to 1 (lacks this trait), (b) "The child seeks his/her own answers and solutions to problems"--rate from 5 to 1 as before, and (c) "Child's attitude towards school"--please comment. Responses to these three items will be used to measure the effect of different types of motivation on multipotentiality.

Analysis of the Data

Once the data were coded, several means of analysis were planned and executed. As the data set was quite large, the SPSS-X computer program was utilized. Analyses included frequency counts and means, contingency tables and chi square statistics, correlations, partial correlations, *t*-tests, ANOVAs, and Student-Newman-Keuls multiple comparisons. Some analyses included all 180 subjects, while others included just those who completed the self-rated multipotentiality item ($n = 110$), as this item was utilized in many analyses to separate subjects by level of multipotentiality.

CHAPTER 3: RESULTS AND DISCUSSION

Evidence of Multipotentiality

The present sample shows much evidence--available from a number of different sources--of multipotentiality. Self-ratings on multipotentiality-related descriptors are shown in Table 2. When asked to rate themselves against the expert-validated definition of multipotentiality (MP)--having "the ability and desire to pursue different activities and goals"--40.9% of the subjects rated this characteristic as being "very much true" of them, 49.1% of the subjects rated this characteristic as being "moderately true" of them, 9.1% of the subjects rated this characteristic as being "not really true" of them, and 0.9% of the subjects rated this characteristic as being "not at all true" of them. For the purposes of this study, the last two groups will be combined and referred to as the "low multipotentialed group." Thus 90% of the subjects consider themselves to be multipotentialed. Retrospective self-ratings of MP for 1984, while lower (60.7%), are still indicative of multipotentiality within this sample.

Such results are not surprising, as Milgram (1989) has suggested that the majority of the gifted population--the "mildly" and "moderately" gifted, as opposed to the "profoundly" gifted--are multipotentialed. The present sample would fit this categorization as their mean Otis-Lennon Mental Ability Test IQ score was 124.5 (*SD* = 12.4). As well, any of the subjects who were formally identified as being gifted for school-placement purposes, prior to their attendance at the 1984 Gifted Summer School Programs, may also have been selected for their multipotentiality. In order to succeed in a gifted program in school, a student will need to be able to do well in all subject areas. Therefore multipotentiality may often be a prerequisite for being labeled "gifted" (M. A. B. Delcourt, personal communication, March 7, 1994). Also predisposing this sample to multipotentiality is the fact that the subjects were selected from Summer Programs that were general in nature. It is not unreasonable to suppose that more unidimensional children would have opted to attend specialty Summer Programs in their particular area of interest (F. G. B. Rejskind, personal communication, March 9, 1994). Thus it is quite plausible that 90% of the present sample be multipotentialed.

Other evidence of multipotentiality supports this contention. As can be seen in Table 2, 90.1% of the subjects rated themselves as having a variety of opportunities open to them, 99.1% of the subjects rated themselves as having a variety of abilities, and 99.1% of the subjects rated themselves as having a variety of interests. Opportunity may pave the way for multipotentiality by opening doors to different activities and experiences. Of the

Table 2

Multipotentiality-Related Descriptors

Variable	Mean	*SD*	not at all ---------- very much true of me				*n*
			1	2	3	4	
variety of interests	3.8	0.4	0 0%	1 0.9%	23 20.7%	87 78.4%	111
variety of ability	3.7	0.5	0 0%	1 0.9%	34 30.6%	76 68.5%	111
variety of opportunity	3.4	0.7	0 0%	1 9.9%	42 37.8%	58 52.3%	111
self-rated MP for 1993/94	3.3	0.7	1 0.9%	10 9.1%	54 49.1%	45 40.9%	110
self-rated MP for 1984	2.9	1.0	7 6.5%	35 32.7%	29 27.1%	36 33.6%	107

subjects whose parents' occupations were noted (n = 144), 72% fell into the two highest of six SES groups, 20% into the two middle SES groups, and only 8% into the two lowest SES groups. This may also account for the fact that 88% of the subjects (n = 111) are presently attending school. This high level of post-secondary educational pursuit, along with high IQs (M = 124.5), also attests to the subjects' high ability levels. Those who define multipotentiality as multiple abilities (Davis & Rimm, 1989; Herr, 1979; Isaacs, 1973; Jepsen, 1979; Marshall, 1981; Willings, 1986), could therefore be justified in labeling most of this sample as multipotentialed. Those who factor interest-diversity into the multipotentiality equation (Berger, 1989; Colangelo, 1991; Delisle & Squires, 1989; Kerr, 1991; Roper & Berry, 1986; Sanborn, 1974; Silverman, 1993), would also find a great deal of support for this in the data gathered.

On the Creative Activities Checklist distributed to the subjects in 1984, the mean number of activities the subjects (n = 96) indicated having participated in was 16.1 (SD = 8.1). On the 1993/94 Questionnaire, three self-generated lists of leisure activities were obtained (see Table 3). Taking into consideration the fact that the task was open-ended and thus likely to underestimate actual participation, further evidence of multiple interests

Table 3

Leisure and Career Interests

Variable	*n*	Resp. Range	Median	Mean	*SD*
Creative Activities Checklist (1984)	96	1-39	15	16.1	8.1
leisure activities ever participated in	100	3-68	16	17.4	9.6
leisure activities participated in last year	111	1-28	7	7.6	4.3
leisure activities would participate in if chance	106	0-12	3	3.7	2.6
# career goals in elem. school	180	0-6	1	1.3	1.1
# career goals in high school	180	0-5	2	1.8	1.1
# career goals since high school	180	0-7	2	2.1	1.2
# career goals presently considering	180	0-7	1	1.4	1.0
# career goals listed on My Vocational Situation	107	0-9	4	3.6	2.0
total # career goals ever considered	180	0-17	5	4.8	2.5

is provided. Subjects indicated having participated in a mean of 7.6 leisure activities in the past year (*SD* = 4.3), and having wanted to pursue an additional mean of 3.7 leisure activities if they had had the chance (*SD* = 2.6). The mean number of leisure activities ever participated in was 17.4 (*SD* = 9.6), although the range extended up to a high of 68 activities listed by one subject. This measure is considered to provide only a general indication of participation in leisure activities, as thoroughness of responding seemed to vary extensively. For example, many subjects did not list any activities typically pursued in childhood, and while some listed five different sports others just listed "sports."

Nevertheless, without having the aid of a checklist or categories to prompt their thoughts, the subjects did indicate actual participation in a number of leisure activities, as well as the desire to pursue more activities than they were actually able to do.

Table 3 also lists the number of career goals reported by the subjects for various periods of time. The retrospective data are not given too much importance, as the subjects' recall of less-salient career goals is no doubt incomplete. When asked during the telephone interview to specify which career goals were presently being considered, 34.4% of the subjects (n = 180) listed more than one career goal. A further 6.1% of the subjects did not list any career goals but, based on other information gathered in the course of the telephone interviews, this seems to be due to confusion rather than lack of choices. Even the fact that 59.4% of the subjects indicated a single career goal should not be taken as evidence that these subjects' career interests are unidimensional. The nature of career decision-making is such that one generally attempts to prioritize and focus any number of career interests into a single obtainable goal (Fredrickson, 1972). Thus, even though one goal may be reported, many interests may exist. And while some of the subjects indicated having had their single career goal in mind for years, other subjects only recently came to focus upon a particular goal. It is likely that these subjects' career goals may change--they are still young (mean age = 20.2 years) and for the most part are still students (88%).

This line of reasoning gains support from the fact that the number of career goals under consideration, as reported on the My Vocational Situation (MVS), was considerably higher (M = 3.6) than that reported during the telephone interview (M = 1.4). Some of the career goals reported during the telephone interview as having been considered at a previous time, but not presently, seem to have been important enough to be reported on the MVS (part of the Mailed Questionnaire the subjects received a month after their telephone interviews) as being considered at the present time. The mean number of career goals ever considered by the subjects (a tally compiled by this investigator) was 4.8 (SD = 2.5), with the number of goals ranging up to 17. Therefore there does seem to be evidence, from the subjects' reported career interests, of some degree of multipotentiality.

When asked directly if they had ever had more than one career choice in mind at the same time, 72.5% of the subjects responded affirmatively. From the 115 subjects who elaborated upon such choice, 52 elaborations were positive, 36 elaborations were negative, and the remaining 27 elaborations were basically neutral. When asked about any problems they had ever experienced during career decision-making, 73.4% of the subjects (n = 180) did mention a problem, and of these problems, 14.4% had to do with multiple choices. Thus while many subjects reported multiple career interests, few subjects

spontaneously mention a problem resulting from overchoice. Nevertheless, responses to two questions on the MVS, do indicate that this may be somewhat problematic for many of the subjects. Concern over present interests changing was reported by 42.3% of the respondents (n = 111), and 62.7% of the respondents (n = 110) did not want to increase the number of occupations they could consider. It therefore appears that overchoice is an issue for some of the sample.

Evidence within the sample for multipotentiality has come from self-ratings and self-reports, reported behaviours, and an IQ test. Evidence for the motivational aspect of multipotentiality (the "*desire* [italics added] to pursue different activities and goals") is also available from other tests and parental-ratings obtained in 1984. On the SSI, the subjects' (n = 123) mean score was 55.8 out of 75 (SD = 11.8). On the learning subscale, the mean score was 4.6 out of 7 (SD = 1.3). While comparison scores are unavailable to this investigator, the subjects responded favourably to items on the two measures 74.4% and 65.7% of the time respectively. On the Children's Science Curiosity Scale, the subjects' (n = 112) mean score was 111.8 out of 150 (SD = 19.7). The reported mean (M = 107) for a sample of 108 fifth grade students used in the development of the scale (Harty & Beall, 1984) was exceeded by the present sample. A parental-rating (n =130) of the child's curiosity produced a mean of 4.2 on a five-point scale (SD = 0.9). Likewise, a rating of the degree to which the child seeks answers produced a mean of 4.2 (SD = 0.8). Extrapolations made from parental-descriptions of the child's attitude towards school (n = 127), resulted in 64.6% of the subjects having positive attitudes towards school, 15.0% having neutral attitudes, and 20.5% of the subjects having somewhat negative attitudes. Thus tests taken and parental-ratings obtained in 1984 show the subjects to be a generally curious group with favourable attitudes towards school. Motivation to learn thus seems characteristic of the sample, and could explain the high levels of multipotentiality so far observed.

The last type of evidence for multipotentiality in this sample comes from scores on the Strong Interest Inventory (SII). Such results are available from the 1993/94 (n = 110) and 1984 (n = 103) administrations. Table 4 contains summary data of these and related scores. As can be seen, mean scores have increased while standard deviations have decreased over the ten-year interval. Therefore it seems that interests have increased with time, as was previously indicated by the higher self-rating of multipotentiality for 1993/94, as compared to that for 1984. There are exceptions to this pattern, however. Three scores calculated from obtained SII scores--Holland's (1985) measure of differentiation, Iachan's (1984) measure of differentiation, and Holland's measure of consistency which,

Table 4

Strong Interest Inventory Scores from 1984 and 1993/94

Variable	1984 SII Scores (n = 103)				1993/94 SII Scores (n = 110)			
	Range	Median	Mean	*SD*	Range	Median	Mean	*SD*
total of all 6 GOT scores	146-425	269	264.3	60.1	178-379	273	275.1	37.8
# GOT > "mod. high"	0-6	0	0.9	1.7	0-6	1	1.1	1.3
# BIS > "mod. high"	0-22	3	4.5	5.3	0-17	5	5.8	4.0
# Holland categ. w/ OS > 40	0-6	4	3.6	1.3	0-6	4	4.4	1.0
% "likes"-- occupations	1-82	18	22.0	18.3	5-75	22	24.1	13.4
% "likes"-- school subjects	0-99	31	31.7	22.6	3-94	36	37.9	17.7
% "likes"-- leisure activities	0-99	31	33.2	21.9	8-87	41	38.5	15.3
Holland differentiation*	5-33	15	15.4	5.6	4-35	21	20.6	7.0
Iachan differentiation*	14-37	25	24.8	4.8	19-34	27	26.6	3.5
consistency*	1-3	3	2.4	0.7	1-3	3	2.5	0.7

Note. Only 61 of the subjects overlap across the two SII administrations.

** Expect an inverse relationship between these variables and multipotentiality, therefore expect these scores to have decreased with time.

theoretically, should be inversely related to multipotentiality, are not indicative of increased multipotentiality with time.

If the absolute magnitude of the values of the SII scores is examined, evidence for the existence of multipotentiality becomes further complicated. If the 1993/94 data are examined for instance (the same arguments apply to the 1984 data), the mean percentage

of "like" responses (as compared to "indifferent" or "dislike") to the 39 listed leisure activities was 38.5%; to the 36 listed school subjects was 37.9%; and to the 131 listed occupations was 24.1%. These numbers suggest a diversity of interests, as do extrapolations made from Occupational Scale (OS) and Basic Interest Scale (BIS) scores. Subjects received one point for each of the six Holland (1985) themes in which they had an OS score equal to or greater than 40--what Hansen and Campbell (1985) have rated as high. Thus out of a possible six, the mean number of OS scores equal to or greater than 40 was 4.4 (SD = 1.0). The mean number of BIS scores earning a rating of "moderately high" or above was 5.8 (SD = 4.0) out of a possible 23. In both cases, the obtained mean scores are great enough to indicate a diversity of strong interests. But in the case of the General Occupational Theme (GOT) scores--the "backbone" of the SII--neither the number of GOT scores at or above the "moderately high" level (M = 1.1 out of 6, SD = 1.3), nor the absolute values of the GOT scores imply particularly high interest levels. Thus strong interests are occurring within a single Holland theme, which is not particularly suggestive of multipotentiality, although there could still be a range of interests within that theme. The absolute values of the six GOT scores, as well as of the 23 BIS scores, are also lower than those of the normative sample. Both GOT and BIS scales were standardized to have a mean of 50, based on the scores obtained by the normative sample. Table 5 compares GOT and BIS scores from the present sample with those of the normative sample. The present sample's scores are generally lower than those of the normative sample, indicating weaker interests and failing to support the previous evidence for multipotentiality.

To summarize, (a) self-ratings of multipotentiality and related characteristics, (b) reported leisure activities, career goals, and career-oriented concerns, (c) IQ scores and post-secondary educational attendance, (d) tested and parental-ratings of attitude towards learning, and (e) some scores from the SII, all indicate high levels of multipotentiality in the present sample. Other scores from the SII (the absolute value of the GOT and BIS scores, as well as measures of differentiation and consistency) do not indicate high levels of multipotentiality. Taken together, this investigator posits that many of the subjects are indeed multipotentialed, and that the SII is not an adequate indicator of such. Whether or not this is true, however, is still to be established.

Various Definitions/Measures of Multipotentiality

In order to further describe the sample and elaborate upon the concept of multipotentiality, it was necessary to utilize a working-definition of multipotentiality. As

Table 5

Comparison of 1984 and 1993/94 GOT and BIS Scale Scores with the Norm Group

Scale	Sex	Norm Group* (n = 600)'		1984 Sample (n = 103)"		1993/94 Sample (n = 110)"'	
		Mean	*SD*	Mean	*SD*	Mean	*SD*
realistic	f	46.5	9.1	41.2	10.4	43.9	9.3
GOT	m	53.5	9.6	46.5	10.1	46.5	9.3
investigative	f	48.9	10.3	46.0	12.2	49.3	9.7
GOT	m	51.1	9.6	45.6	11.3	49.1	9.4
artistic	f	52.6	9.2	42.5	10.8	53.5	8.9
GOT	m	47.4	10.1	48.3	9.9	48.2	10.1
social	f	50.1	10.2	43.9	12.5	51.4	10.5
GOT	m	49.9	9.8	37.8	12.6	43.0	9.7
enterprising	f	49.2	9.4	44.7	10.7	43.7	8.7
GOT	m	50.8	10.5	43.8	10.8	39.9	8.9
conventional	f	49.6	10.4	45.5	11.7	45.9	9.4
GOT	m	50.4	9.5	43.9	11.9	41.7	8.7
agriculture	f	47.9	9.9	43.6	7.1	43.2	9.4
BIS	m	52.1	9.7	43.6	6.5	43.4	7.9
nature	f	50.7	10.1	41.6	11.3	45.6	11.5
BIS	m	49.3	9.9	37.3	9.9	41.4	11.1
adventure	f	47.3	9.5	46.5	10.9	50.6	11.6
BIS	m	52.7	9.7	53.5	9.5	56.9	10.1
military act.	f	46.9	8.1	48.3	9.1	46.3	9.2
BIS	m	53.1	10.8	54.9	12.1	49.2	9.9
mech.activ.	f	46.7	9.1	44.4	10.1	46.6	9.4
BIS	m	53.3	9.7	50.0	9.9	50.0	10.0
science	f	48.6	10.0	48.7	10.4	49.8	10.2
BIS	m	51.4	9.8	51.8	10.0	51.9	9.1
mathematics	f	48.7	9.9	49.7	10.2	51.1	10.5
BIS	m	51.3	10.0	48.9	9.5	50.0	10.7
med. science	f	49.1	10.1	47.0	10.4	48.8	11.3
BIS	m	50.9	9.8	44.6	10.4	44.3	10.7

med. service	f	50.2	10.6	50.9	11.0	52.1	10.2
BIS	m	49.8	9.4	45.0	9.4	45.5	8.1
music/drama	f	53.1	9.0	49.1	10.1	54.9	9.0
BIS	m	46.9	9.9	42.2	9.3	48.0	8.8
art	f	53.5	9.0	50.6	10.5	54.9	8.8
BIS	m	46.5	9.8	44.6	9.5	46.2	10.6
writing	f	52.5	9.0	48.4	10.6	53.6	10.1
BIS	m	47.5	10.3	42.1	9.5	48.3	10.4
teaching	f	50.0	10.4	48.7	11.9	55.3	9.1
BIS	m	50.0	9.6	39.4	11.3	48.4	11.0
soc. science	f	51.7	10.2	45.4	10.0	55.0	10.7
BIS	m	48.3	9.5	40.6	9.2	44.2	9.8
athletics	f	46.9	9.3	43.7	9.0	45.5	9.6
BIS	m	53.1	9.8	47.9	10.1	50.5	9.6
domest. act.	f	54.1	9.1	47.6	12.4	55.2	9.5
BIS	m	45.9	9.1	40.7	11.2	44.9	7.1
relig. activ.	f	50.4	10.1	43.6	9.3	47.4	9.7
BIS	m	49.6	9.9	40.4	9.1	42.8	8.1
pub. speak.	f	49.4	9.8	44.8	9.0	47.9	10.1
BIS	m	50.6	10.1	45.1	9.9	46.8	9.7
law/politics	f	48.9	10.0	44.3	8.3	47.0	10.1
BIS	m	51.1	8.6	45.2	10.4	47.0	10.5
merchand.	f	50.6	9.9	44.6	8.7	44.0	8.3
BIS	m	49.4	10.1	41.6	9.0	38.6	9.1
sales	f	48.7	9.4	49.1	7.8	43.5	7.3
BIS	m	51.3	10.4	48.8	8.1	43.3	7.5
bus. mgmt.	f	48.9	9.9	44.1	10.7	43.2	8.8
BIS	m	51.1	10.0	43.1	12.0	39.9	9.8
office prac.	f	51.3	11.1	51.1	10.4	49.2	9.1
BIS	m	48.7	8.6	46.9	9.3	42.6	6.0

* Normative data from Hansen & Campbell, 1985, p. 30.

' n = 300 f & 300 m; " n = 44 f & 59 m; '" n = 40 f & 70 m

no such measure exists, it was necessary to develop one for the present study. The self-rating of present-day levels of multipotentiality (self-rated MP) was chosen for two reasons. First, the definition of the concept against which subjects rated themselves had high face validity and its content was validated by seven giftedness specialists who have written extensively about multipotentiality (see Appendix C). Second, of the 32 potential measures of multipotentiality that this investigator isolated from the data, this one had the broadest levels of concurrent validity (see Appendix E1). Self-rated MP correlated at the .01 level of significance with a sum of the varieties of interests and ability, variety of ability, number of leisure activities ever participated in, and percentage of "like" responses indicated for leisure activities on the 1993/94 SII; and at the .05 level of significance with self-rating of multipotentiality for 1984, variety of interests, number of leisure activities participated in last year, and from the 1993/94 SII, with the total GOT score, number of high BIS scores, and percentage of "like" responses indicated for school subjects.

Thus, as indicated in Table 6, self-rated MP was related to other self-ratings, participation in leisure activities, and 1993/94 SII scores. This provides good support for the contention that this working-definition is a valid measure of multipotentiality. This measure did not, however, significantly correlate with the number of career goals or the 1984 SII scores. Perhaps multipotentiality does not operate in the vocational realm. Or perhaps the number of career goals does not provide a valid indication of multipotentiality within this sample, given the stage of development of most of the subjects. With an average age of 20.2 years, and as most of the subjects are still students (88%), it is likely that many of the subjects are in the midst of career decision-making. This could result in many of the subjects having multiple career goals, regardless of and masking level of multipotentiality. Alternately, the process of career decision-making itself (narrowing choices) could also have artificially restricted all subjects' number of reported career goals.

The lack of relationship between self-rated MP and the 1984 SII scores could be explained in at least two different ways. First, levels of multipotentiality may have changed within the subjects between administrations of the SII--sometime during each subject's adolescent years. Perhaps multipotentiality was not stable in 1984, or perhaps multipotentiality only comes into play after an accumulation of a certain number of experiences or when one is old enough to make one's own choices. But these hypotheses are somewhat weakened by the fact that self-rated MP is significantly correlated ($p < .01$) with 1984 parental-ratings of the child's answer-seeking. Also, while not reaching significance, the direction of relationship is as expected between self-rated MP and several other 1984 measures--the Creative Activities Checklist, parental-rated curiosity, and the

Table 6

Correlations Between Self-Rated MP and Other Potential Measures of MP

Variable	*df*	*r*	*p*
self-rated MP for 1984	105	.223	< .05
variety of interests	108	.209	< .05
variety of ability	108	.403	< .01
sum of variety of interest & ability	108	.360	< .01
Creative Activities Checklist (1984)	57	.255	n.s.
leisure activities ever participated in	97	.270	< .01
leisure activities participated in last year	108	.234	< .05
leisure activities would have participated in if chance	103	.127	n.s.
# career goals presently considering	108	-.090	n.s.
# career goals listed on My Vocational Situation	104	.087	n.s.
total # career goals ever considered	108	.034	n.s.
'94 total of all 6 GOT scores	107	.228	< .05
'94 # GOT > "moderately high"	107	.141	n.s.
'94 # BIS > "moderately high"	107	.206	< .05
'94 # Holland categories w/ OS > 40	107	.015	n.s.
'94 % "likes"--occupations	107	.158	n.s.
'94 % "likes"--school subjects	107	.237	< .05
'94 % "likes"--leisure activities	107	.280	< .01
'94 Holland differentiation	107	-.006	n.s.
'94 Iachan differentiation	107	.143	n.s.
'94 consistency	107	.038	n.s.
'84 total of all 6 GOT scores	58	-.119	n.s.
'84 # GOT > "moderately high"	58	-.090	n.s.
'84 # BIS > "moderately high"	58	-.062	n.s.
'84 # Holland categories w/ OS > 40	58	-.047	n.s.
'84 % "likes"--occupations	58	-.075	n.s.
'84 % "likes"--school subjects	58	-.026	n.s.
'84 % "likes"--leisure activities	58	-.038	n.s.
'84 Holland differentiation	58	-.010	n.s.
'84 Iachan differentiation	58	-.095	n.s.
'84 consistency	58	.003	n.s.

SSI (see Table 6). A second explanation for the lack of relationship between self-rated MP and the 1984 SII scores is that the 1984 SII scores are not valid--either because the instrument is not valid for such young subjects (mean age = 10.7 years) or because some

of the subjects purposefully responded inaccurately. As the subjects were administered many measures during the 1984 Summer Programs, it is quite likely that some of them failed to respond to the best of their abilities. These hypotheses are somewhat supported by the fact that the stability of the SII over the ten-year period between administrations was fairly low (see Appendix E2).

In order to further investigate the concept of multipotentiality--what exactly it is, when and where it occurs, what outcomes it promotes, and so on--the working-definition that will be utilized will be that of self-rated MP. This measure was constructed to be of high content validity and was found to be highest in concurrent validity when compared to 31 other potential measures of multipotentiality. Further analysis of the data may shed more light on the appropriateness of this measure.

Correlates of Multipotentiality

In order to learn more about the concept of multipotentiality by comparing subjects with varying levels across a number of variables, several types of statistical analyses were performed. The first of these analyses were correlations and partial correlations. In each case, self-rated MP was used to determine each subject's level of multipotentiality: 45 subjects were thus classified as having a high level of MP, 54 subjects as having a moderate level of MP, and 11 subjects as having a low level of MP. The 80 subjects who did not complete the self-rated MP measure were not included in these analyses. This investigator realizes that it is not ideal to utilize ordinal data in such analyses (*cf.* Glass & Stanley, 1970), but this seemed the only practical way in which to analyze the data.

Correlations between self-rated MP and 58 other variables are found in Table 7. Without controlling for possible extraneous influences, eight of the correlations were found to be significant at the .01 level and six at the .05 level. All correlations were low, but the findings provide direction for further research in this area. Perhaps if this measure had been more discriminating, more and stronger correlations would have resulted. The same can also be said if a different sample had been used--one in which there were as many nonmultipotentialed as multipotentialed subjects. As it was, however, all of the significant correlations and most of the nonsignificant correlations fell in the expected direction.

Both SES and verbal IQ were significantly correlated ($p < .05$) with multipotentiality. Perhaps the additional experiences available to a child raised in a higher SES home foster the development of multiple interests and abilities, or even the

Table 7

Correlations Between Self-Rated MP and Other Variables

Variable	*df*	*r*	*p*
age	108	-.039	n.s.
education level	108	-.080	n.s.
SES of parents	99	.220	< .05
'84 verbal IQ	107	.202	< .05
'84 nonverbal IQ	108	.080	n.s.
'84 creativity/divergent thinking	105	.050	n.s.
'84 Creative Activities Checklist	57	.255	n.s.
leisure activities ever participated in	97	.270	< .01
# career goals listed on My Voc. Situat.	104	.087	n.s.
variety of interests	108	.209	< .05
variety of ability	108	.403	< .01
sum of variety of interests & ability	108	.360	< .05
variety of opportunity	108	.047	n.s.
self-rated MP for 1984	105	.223	< .05
'84 parental-rating of answer-seeking	78	.345	< .01
'84 parental-rating of curiosity	78	.146	n.s.
'84 Children's Science Curiosity Scale	70	-.128	n.s.
'84 School Sentiment Index	76	.120	n.s.
'84 learning subscale of SSI	76	.024	n.s.
total experience with 41 moderators	108	.170	n.s.
total benefit from 41 moderators	108	.083	n.s.
Vocational Identity Scale	108	-.025	n.s.
difficulty of career-deciding (hard-easy)	107	-.126	n.s.
feel while career-deciding (bad-good)	106	.120	n.s.
confident will find career & be happy	108	.112	n.s.
satisfaction with career	107	.001	n.s.
satisfaction with self	107	.053	n.s.
satisfaction with life	107	.057	n.s.
total overall satisfaction	105	.020	n.s.

congruence btw. '84 & '94 Holland type	58	.022	n.s.
'94 total of all 6 GOT scores	107	.228	< .05
'94 # GOT > "moderately high"	107	.141	n.s.
'94 # high GOTs (0, 1, 2-6)	107	.114	n.s.
'94 # high GOTs (1, 2-3, 4-6)	107	.115	n.s.
'94 # BIS > "moderately high"	107	.206	< .05
'94 # Holland categories w/ OS > 40	107	.015	n.s.
'94 % "likes"--occupations	107	.158	n.s.
'94 % "likes"--school subjects	107	.237	< .05
'94 % "likes"--leisure activities	107	.280	< .01
'94 academic comfort	107	.200	< .05
'94 intro/extraversion	107	-.286	< .01
'94 Holland differentiation	107	-.006	n.s.
'94 Iachan differentiation	107	.143	n.s.
'94 consistency	107	.038	n.s.
'84 total of all 6 GOT scores	58	-.119	n.s.
'84 # GOT > "moderately high"	58	-.090	n.s.
'84 # high GOTs (0, 1, 2-6)	58	-.134	n.s.
'84 # high GOTs (1, 2-3, 4-6)	58	-.116	n.s.
'84 # BIS > "moderately high"	58	-.062	n.s.
'84 # Holland categories w/ OS > 40	58	-.047	n.s.
'84 % "likes"--occupations	58	-.075	n.s.
'84 % "likes"--school subjects	58	-.026	n.s.
'84 % "likes"--leisure activities	58	-.038	n.s.
'84 academic comfort	58	-.010	n.s.
'84 intro/extraversion	58	.062	n.s.
'84 Holland differentiation	58	-.010	n.s.
'84 Iachan differentiation	58	-.095	n.s.
'84 consistency	58	.003	n.s.

motivation to learn and do more. Likewise, IQ may do the same. Another finding which supports this contention, is the fact that the 1984 parental-rating of answer-seeking is also significantly ($p < .01$) related to multipotentiality. It is difficult, however, to draw firm conclusions as the range of SES and IQ in this sample was quite restricted.

Subjects' self-ratings of variety of interests, variety of ability, the sum of these two variables, and that of multipotentiality for 1984 were also significantly related to multipotentiality. The retrospective self-rated MP measure is not given too much weight due to its potential unreliability, but the other three measures offer some insight into the phenomenon of multipotentiality. The variety of ability variable reached a higher level of significance ($p < .01$) and had a correlation twice as large as the variety of interests variable, indicating that ability is more closely related to multipotentiality than are interests. And while the sum of these two variables reached significance, together they account for less variance than did the ability variable alone. The number of leisure activities ever participated in also reached significance ($p < .01$). This is not surprising due to the significance of correlations with SES and IQ, but whether the relation is moderated by ability, interest, or motivation is unclear. The whole concept of "leisure activities" implies engaging in activities which are pleasurable, but is pleasure derived from success due to sufficient ability or from the pursuit and fulfillment of interests?

Several of the 1993/94 SII variables were significantly correlated with multipotentiality. Despite the fact that this sample's GOT scores were lower than the norm (see Table 5), the total of all six GOT scores was found to be significantly correlated ($p < .05$) with multipotentiality. The three variables having to do with the number of high GOT scores (number of the six scores greater than or equal to "moderately high"), did not reach significance. Gaeddert and Hansen (1993) had suggested one of these measures as being a good indicator of interest diversity: 1 high GOT score signified a narrow range of interests while 4-6 such scores signified a wide range of interests (especially as at least two of these scores had to be on opposing sides of Holland's hexagon, and thus represented theoretically very different types of interest). Since Gaeddert and Hansen were not sure what to do with those who had no high GOT scores--Swanson and Hansen (1986) have stated that profile elevation leads to important differences, while Gottfredson and Jones (1993) have stated that elevation is characteristic of an outgoing response-style and thus is not an important consideration--they simply omitted them from their analysis. Aside from this problem, the Gaeddert-Hansen measure of interest diversity seemed an ideal measure of multipotentiality--it combined strength and diversity of interests. Unfortunately this measure, while reaching levels of significance in correlations with other variables on the

SII, did not do so with self-rated MP or other nonSII measures of multipotentiality (see Appendix E1). Due to the dearth of subjects who actually had two or more high GOT scores, it was not possible to ascertain whether or not those who had no high GOT scores fit into a simple pattern with low levels of MP, or whether they broke the pattern. The number of high BIS scores was significantly correlated with multipotentiality. This is not surprising as this measure is more sensitive than the high GOT measures: There exist several BIS scales within each GOT scale.

Neither Holland's (1985) nor Iachan's (1984) index of differentiation was significantly related to multipotentiality. Theoretically they should have been inversely related since the concept of differentiation implies narrow rather than diverse interests. The correlation of multipotentiality with the Iachan index did not fall in the expected direction. In fact, the Iachan index was positively and significantly correlated with other SII variables which measured strength of interests (see Appendix E1). This finding refutes Gottfredson and Jones' (1993) statement that the Iachan index measures differentiation independent of elevation. Holland's measure of consistency also failed to significantly correlate with multipotentiality. The inverse correlation which would have been predicted theoretically, as consistency requires that interests be closely related rather than diverse (further apart on Holland's hexagon), was not found. Again, measures taken from the SII, which are theoretically related to multipotentiality, have failed to show any significant relationship.

Further measures from the 1993/94 SII did, however, correlate significantly with multipotentiality. The percentage of "like" responses to school subjects and to leisure activities were both significant, while that of occupations was not. Does this reflect the general nature of career decision-making as a narrowing process? While it is possible to take a variety of school subjects and engage in a variety of leisure activities, it is less easy to participate in a variety of occupations without suffering ill-effects. Did the subjects--multipotentialed or not--restrict their affirmative responses to the occupations? Perhaps since occupations are typically more permanent, time-consuming, and "important" than other activities, subjects were more strict in their responding-style. For a variety of reasons it is probably easier to dislike an occupation than a "free time" activity. It is also possible that the range of career choices was restricted within this sample--many sought traditional and professionally-oriented occupations--and thus the SII was unable to differentiate between individuals in this manner. This seems odd, however, considering that there are over three times as many occupations listed on the SII than there are school subjects or leisure activities. Nevertheless, as most of the sample are presently in the

middle of their career decision-making, this could restrict their responding-styles. An older (or younger) sample could help to isolate this factor. It could also be that multipotentiality exists more in the avocational than vocational realm.

Academic comfort level and degree of extraversion were also significantly correlated with multipotentiality. Academic comfort could be related to IQ or to attitude towards learning, both of which also relate to multipotentiality. Extraversion could indicate an outgoing personality where externally-oriented activities rather than introspection is preferred. This also makes sense with regard to multipotentiality.

What makes less sense is why none of the 1984 SII variables was significantly correlated to multipotentiality. In fact, the direction of relationship between the 1984 SII variables and multipotentiality is not even as expected. As previously discussed, this could be due to changes in multipotentiality levels within the subjects, between administrations of the SII. Again, this seems unlikely as other variables obtained in 1984 do support the stability of multipotentiality hypothesis. The lack of relationship could also be due to the unreliability of SII scores obtained from such young subjects (mean age = 10.7 years): One subject remembered that he and some friends had purposely "goofed around" while completing the test ten years ago.

The variables from Table 7 were also analyzed with partial correlations which controlled separately for sex, age, SES, educational level, verbal IQ, nonverbal IQ, and a combination of all six factors. Holland (1985) has stated that it is important to control for such factors--and also race (which was too confounded for this Canadian investigation)--when working within his theory. The partial correlations generally increased minimally from the original correlations, and a summary of those that reached significance are reported in Table 8. Four additional correlations reached significance ($p < .05$): 1984 Creative Activity Checklist, total benefit derived from the 41 moderator variables, confident will find a career to be happy with, and percentage of "like" responses to occupations on the 1993/94 SII. Interestingly, controlling for extraneous factors allowed the relationship to be displayed between self-rated MP and both benefit from career-related experiences and predicted future satisfaction with one's career. Therefore it could be that multipotentiality is minimally beneficial. Alternately, multipotentialed individuals may utilize a more optimistic response-style.

Thus significant correlations between self-rated MP and several other variables have been found. As multipotentiality level increased, so did verbal IQ, parental SES, answer-seeking, and interest in leisure activities and school subjects. Overall interest levels on the 1993/94 SII, but not on the 1984 SII, increased with MP level. Self-rated

Table 8

Significant Partial Correlations Between Self-Rated MP and Other Variables

Variable	Covariate							
	None	Sex	Age	SES	Educ	vIQ	nvIQ	All
SES of parents	*	*	*	--	**	*	*	*
'84 verbal IQ	*	*	*	n.s.	**	--	*	*
'84 Creative Act. Checklist	n.s.	*	*	*	*	*	*	*
leisure act. ever particip. in	**	**	**	**	**	**	**	**
variety of interests	*	**	*	n.s.	n.s.	**	*	**
variety of ability	**	**	**	**	**	**	**	**
sum of var. of int. & abil.	*	**	**	**	**	**	**	**
self-rated MP for 1984	*	*	*	*	*	*	*	*
'84 par-rated answ-seeking	**	**	**	**	**	**	**	**
total benefits of 41 moder.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	*
confident happy w/ career	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	*
'94 total of 6 GOT scores	*	*	**	*	**	**	**	*
'94 # BIS > "mod. high"	*	*	*	*	*	*	*	*
'94 % "likes"--occup.	n.s.	n.s.	*	*	*	n.s.	n.s.	n.s.
'94 % "likes"--school subj.	*	*	**	**	**	*	**	*
'94 % "likes"--leisure act.	**	**	**	**	**	**	**	**
'94 academic comfort	*	*	*	*	*	n.s.	*	n.s.
'94 intro/extraversion'	**	**	**	**	**	**	**	**

' Negative relationship between extraversion and self-rated MP.

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

variety of interests and ability, as well as the number of leisure activities ever participated in, followed this same pattern. Holland's (1985) constructs of differentiation and consistency did not, however, correlate significantly with multipotentiality, and thus do not seem to be effective measures of multipotentiality as anticipated. Neither did the Gaeddert-Hansen (1993) diversity measure correlate significantly with MP level. Therefore using the SII to identify multipotentialed individuals does not appear to be feasible.

Comparisons Between Groups Differing in Degree of Multipotentiality

In order to test whether or not the three groups of subjects with different MP levels differed significantly on levels of other variables, the ANOVA procedure was utilized. As can be seen in Table 9, nine of the variables reached significance with differences in levels between at least two of the three groups of subjects. To isolate where the significant differences lay, Student-Newman-Keuls multiple comparisons were performed with those variables, as well as for several others which seemed to approach the values necessary to reach significance (as indicated on Table 9). Basically, those variables for which correlations with multipotentiality had been significant also reached significance in these procedures.

Although neither SES nor verbal IQ reached significance in the ANOVA, the results were in the expected direction. And on the multiple comparisons, significant differences between the moderate and high MP groups were found. The small size of the low MP group probably accounts for the lack of significance between this and the high MP group--both in this instance and in others to follow. The fact that SES of parents and verbal IQ were found to be elevated in the high MP group could explain the subjects' varied interests (due to more experiences made possible with higher SES parents), varied abilities (due to higher IQ and more experiences to develop abilities), and higher motivation levels (passed on by higher SES parents or accompanying higher IQ).

With the ANOVA, variety of interests, variety of ability, and the combination of both of these variables reached significance. Multiple comparisons showed that the low MP group scored significantly lower than the moderate and high MP groups on the variety of interests variable, the variety of ability variable, and a combination of both of these variables. Significant differences were also found between the moderate and high MP groups on variety of ability and the combined variety of interests and ability variables. Although not significant in the ANOVA, self-rated multipotentialed fc. 1984 did reach significance on the multiple comparisons procedure--being higher in the high than low MP group.

Although still self-report, the more behaviourally-based variable--number of leisure activities ever participated in--reached significance ($p < .05$) in the ANOVA. Multiple comparisons showed the difference to lie between the low and high MP groups, with the high MP group having been involved in more leisure activities. Furthermore, two measures obtained in 1984 also provide converging evidence for the validity of the concept of multipotentiality. Scores on the SSI were significantly different in the ANOVA ($p < .05$), and multiple comparisons showed the difference to be between the low

Table 9

Analysis of Variance By Three Levels of Self-Rated MP

Variable (poss. resp. range)	Mean (*SD*) low MP	mod MP	high MP	*F*	*df*	*p* <	groups differing*
age	20.091 (1.300) *n* = 11	20.093 (1.581) *n* = 54	19.907 (1.616) *n* = 43	0.180	2, 105	.835	n.s.
education level (1 - 7)	4.636 (1.206) *n* = 11	4.370 (1.263) *n* =54	4.289 (0.944) *n* = 45	0.410	2, 107	.662	n.s.
SES of parents (0 - 75)	57.545 (17.512) *n* = 11	59.673 (13.384) *n* = 49	65.049 (9.869) *n* = 41	2.680	2, 98	.074	mod/high
'84 verbal IQ	122.818 (10.713) *n* = 11	123.685 (12.224) *n* = 54	128.773 (11.549) *n* = 44	2.600	2, 106	.079	mod/high
'84 nonverbal IQ	44.182 (10.167) *n* = 11	46.944 (7.617) *n* = 54	46.933 (5.141) *n* = 45	0.760	2, 107	.468	n.s.
'84 creativity/ divergent thinking	51.000 (14.560) *n* = 11	52.000 (20.296) *n* = 53	53.512 (14.530) *n* = 43	0.130	2, 104	.877	n.s.
'84 Creative Activ. Checklist (0 - 74)	9.833 (6.853) *n* = 6	15.900 (8.731) *n* = 30	18.087 (8.496) *n* = 23	2.270	2, 56	.112	n.s.
leisure activities ever particip. in	10.500 (5.563) n = 10	16.857 (9.025) *n* = 49	19.775 (10.277) *n* = 40	4.140	2, 96	.019	low/high
# career goals listed on My Voc. Situation	2.667 (1.500) *n* = 9	3.679 (2.007) *n* = 53	3.659 (2.079) *n* = 44	1.030	2, 103	.359	n.s.

variety of interests (1 - 4)	3.400 (0.699) $n = 10$	3.788 (0.412) $n = 52$	3.844 (0.367) $n = 45$	4.472	2, 104	.014	low/mod low/high
variety of ability (1 - 4)	3.300 (0.483) $n = 10$	3.577 (0.537) $n = 52$	3.889 (0.318) $n = 45$	9.695	2, 104	.000	low/mod low/high mod/high
sum of variety of interests & ability (1 - 8)	6.700 (1.059) $n = 10$	7.365 (0.817) $n = 52$	7.733 (0.580) $n = 45$	8.470	2, 104	.000	low/mod low/high mod/high
variety of opportunity (1 - 4)	3.500 (0.527) $n = 10$	3.423 (0.637) $n = 52$	3.467 (0.694) $n = 45$	0.088	2, 104	.916	n.s.
self-rated MP for 1984 (1 - 4)	1.400 (0.699) $n = 10$	1.906 (0.838) $n = 53$	2.114 (0.868) $n = 44$	3.050	1, 104	.052	low/high
'84 parent-rating of answ.-seeking (1 - 5)	3.375 (0.916) $n = 8$	4.159 (0.745) $n = 44$	4.424 (0.663) $n = 33$	6.700	2, 82	.002	low/mod low/high
'84 parent-rating of curiosity (1 - 5)	3.750 (1.035) $n = 8$	4.159 (0.805) $n = 44$	4.273 (0.944) $n = 33$	1.130	2, 82	.328	n.s.
'84 Children's Sci. Curiosity Scale (0 - 150)	114.000 (10.640) $n = 6$	116.632 (19.044) $n = 38$	110.120 (18.415) $n = 25$	0.950	2, 66	.391	n.s.
'84 School Sentiment Index (1 - 75)	44.333 (16.330) $n = 6$	58.250 (11.413) $n = 36$	56.200 (11.427) $n = 35$	3.567	2,74	.033	low/mod low/high
'84 learning subscale of SSI (0 - 7)	4.000 (1.414) $n = 6$	4.722 (1.137) $n = 36$	4.514 (1.358) $n = 35$	0.907	2, 74	.408	n.s.
total experience w/ 41 moderators (0 - 123)	50.700 (17.563) $n = 10$	59.327 (15.244) $n = 52$	60.822 (13.965) $n = 45$	1.885	2, 104	.157	n.s.

total benefit fr. 41 moderators (0 - 123)	40.100 (17.013) $n = 10$	52.365 (18.353) $n = 52$	48.378 (16.501) $n = 45$	2.238	2, 104	.112	n.s.
Vocational Identity Scale (0 - 17)	12.727 (4.901) $n = 11$	11.528 (4.802) $n = 53$	11.711 (4.551) $n = 45$	0.296	2, 106	.745	n.s.
difficulty of career-deciding (1 hard - 5 easy)	3.364 (1.206) $n = 11$	2.833 (1.145) $n = 54$	2.767 (1.109) $n = 43$	1.237	2, 105	.295	n.s.
feel while career-deciding (1 bad - 5 good)	3.182 (1.250) $n = 11$	3.444 (1.058) $n = 54$	3.651 (1.021) $n = 43$	1.000	2, 105	.371	n.s.
confident will be happy w/ career (1 - 5)	3.909 (0.701) $n = 11$	4.204 (0.786) $n = 54$	4.233 (0.812) $n = 43$	0.766	2, 105	.467	n.s.
satisfaction with career (1 - 17)	13.100 (3.381) $n = 10$	12.923 (2.903) $n = 52$	12.911 (3.074) $n = 45$	0.017	2, 104	.983	n.s.
satisfaction with self (1 - 17)	13.300 (3.129) $n = 10$	13.692 (2.271) $n = 52$	13.667 (2.523) $n = 45$	0.109	2, 104	.896	n.s.
satisfaction with life (1 - 17)	13.400 (2.797) $n = 10$	13.115 (2.749) $n = 52$	13.289 (3.389) $n = 45$	0.060	2, 104	.942	n.s.
total overall satisfaction (1 - 51)	39.800 (8.483) $n = 10$	39.731 (6.634) $n = 52$	40.067 (6.837) $n = 45$	0.029	2, 104	.971	n.s.
congruence btw. '84 & '94 Holland types	12.714 (10.515) $n = 7$	12.310 (8.808) $n = 29$	12.958 (8.705) $n = 24$	0.030	2, 57	.966	n.s.
'94 total of all 6 GOT scores	252.455 (37.633) $n = 11$	273.370 (37.568) $n = 54$	283.318 (38.713) $n = 44$	3.164	2, 106	.046	low/high

'94 # GOT > "mod. high" (0 - 6)	0.818 (1.250) $n = 11$	1.019 (1.107) $n = 54$	1.341 (1.509) $n = 44$	1.098	2, 106	.337	n.s.
'94 # BIS > "mod. high" (0 - 23)	3.727 (3.823) $n = 11$	5.593 (3.888) $n = 54$	6.614 (4.150) $n = 44$	2.471	2, 106	.089	n.s.
'94 # Holland categ. w/ OS >40 (0 - 6)	4.273 (1.104) $n = 11$	4.463 (0.926) $n = 54$	4.409 (1.127) $n = 44$	0.160	2, 106	.851	n.s.
'94 % "likes" --occupations	19.364 (11.775) $n = 11$	23.278 (11.953) $n = 54$	25.955 (15.289) $n = 44$	1.206	2, 106	.303	n.s.
'94 % "likes" --school subjects	32.182 (9.031) $n = 11$	34.593 (17.899) $n = 54$	42.341 (17.734) $n = 44$	3.044	2, 106	.052	mod/high
'94 % "likes" --leisure activities	27.545 (13.988) $n = 11$	37.333 (15.199) $n = 54$	42.273 (14.656) $n = 44$	4.561	2, 106	.013	low/mod low/high
'94 academic comfort	41.909 (8.240) $n = 11$	42.926 (16.016) $n = 54$	49.477 (15.514) $n = 44$	2.573	2, 106	.081	mod/high
'94 intro/extraversion (high EV-high IV)	60.727 (6.930) $n = 11$	52.093 (11.053) $n = 54$	48.500 (12.341) $n = 44$	5.304	2, 106	.006	low/mod low/high
'94 Holland differentiation	20.455 (5.355) $n = 11$	20.556 (7.518) $n = 54$	20.409 (6.763) $n = 44$	0.005	2, 106	.995	n.s.
'94 Iachan differentiation	25.091 (3.145) $n = 11$	26.611 (3.547) $n = 54$	27.045 (3.563) $n = 44$	1.360	2, 106	.261	n.s.
'94 consistency (1 - 3)	2.455 (0.820) $n = 11$	2.519 (0.637) $n = 54$	2.545 (0.663) $n = 44$	0.084	2, 106	.919	n.s.

'84 total of all 6 GOT scores	290.857 (86.920) $n = 7$	263.828 (57.373) $n = 29$	260.520 (65.140) $n = 25$	0.630	2, 58	.536	n.s.
'84 # GOT > "mod. high" (0 - 6)	1.857 (2.610) $n = 7$	1.000 (1.732) $n = 29$	1.040 (2.071) $n = 25$	0.557	2, 58	.576	n.s.
'84 # BIS > "mod. high" (0 - 23)	6.714 (8.558) $n = 7$	4.379 (5.046) $n = 29$	4.760 (5.911) $n = 25$	0.449	2, 58	.640	n.s.
'84 # Holland categ. w/ OS >40 (0 - 6)	3.857 (1.574) $n = 7$	3.448 (1.152) $n = 29$	3.520 (1.388) $n = 25$	0.278	2, 58	.758	n.s.
'84 % "likes" --occupations	26.571 (30.490) $n = 7$	22.897 (17.674) $n = 29$	21.400 (19.617) $n = 25$	0.183	2, 58	.834	n.s.
'84 % "likes" --school subjects	33.143 (36.048) $n = 7$	32.414 (23.262) $n = 29$	31.320 (23.643) $n = 25$	0.020	2, 58	.980	n.s.
'84 % "likes" --leisure activities	36.143 (33.324) $n = 7$	32.034 (21.003) $n = 29$	32.160 (23.572) $n = 25$	0.091	2, 58	.913	n.s.
'84 academic comfort	40.143 (22.423) $n = 7$	40.207 (15.925) $n = 29$	39.760 (18.521) $n = 25$	0.004	2, 58	.996	n.s.
'84 intro/extraversion (high EV-high IV)	55.000 (20.640) $n = 7$	60.552 (13.303) $n = 29$	59.760 (14.816) $n = 25$	0.397	2, 58	.674	n.s.
'84 Holland differentiation	11.857 (2.968) $n = 7$	17.207 (5.525) $n = 29$	14.320 (6.638) $n = 25$	3.124	2, 58	.051	n.s.
'84 Iachan differentiation	26.000 (7.118) $n = 7$	24.966 (4.420) $n = 29$	24.440 (4.925) $n = 25$	0.280	2, 58	.757	n.s.

'84 consistency (1 - 3)	2.571 (0.535) $n = 7$	2.207 (0.774) $n = 29$	2.400 (0.764) $n = 25$	0.866	2, 58	.426	n.s.

* Based on analysis with Student-Newman-Keuls multiple comparisons ($p < .05$).

and both the moderate and high groups (the scores in the low MP group being lower). This same pattern of results was also found for parental-ratings of answer-seeking ($p < .01$). Thus divergent sources of information show the high MP subjects to be significantly more interested in doing and learning than the lower MP subjects. This suggests that motivation may play a key role in the development of multipotentiality.

Three variables from the 1993/94 SII reached significance in the ANOVA (total of six GOT scores, percentage of leisure activity "likes", and intro/extraversion) and two more reached significance on the multiple comparisons (percentage of school subject "likes" and academic comfort). The low MP group had a significantly lower GOT total than did the high MP group. The percentage of leisure "likes" and level of extraversion was also significantly lower for the low than moderate or high MP groups. Lastly, the percentage of school subject "likes" and level of academic comfort was significantly lower for the moderate than high MP group. Thus it seems that subjects with higher levels of multipotentiality have stronger interests--particularly interests in leisure activities and school subjects, although the results for the occupational interests were in the expected direction. The more multipotentialed subjects were also more extraverted and rated as more likely to continue on with post-secondary education. Again, the motivation to interact with the world is evident.

Once again, not only did the 1984 SII variables fail to significantly distinguish between the MP groups, they also fell opposite to the expected direction. It has already been mentioned that this may be due to changes in MP levels over time or to the unreliability of the earlier SII scores.

Several nominal variables have not yet been examined for their relationship to multipotentiality, since they were unsuited to the correlation and ANOVA procedures. These variables were analyzed in contingency tables, and for the few tables in which there were adequate subjects per cell (at least 80% of the cells having expected values of more than five), chi-square statistics were considered. In Table 10, the only variable to reach significance in this manner--that of ever having had more than one career choice in mind at the same time--is shown. This was more likely ($p < .05$) to be the case for high MP

Table 10

Contingency Table of Self-Rated MP By Having Had 1+ Career Choice Concurrently

actual tally (column %)	never had 1+ career choice concurrently	did have 1+ career choice concurrently	total
low MP	7 (21)	4 (5)	11
moderate MP	15 (45)	39 (51)	54
high MP	11 (33)	33 (43)	44
total	33	76	109

chi square = 6.539 $df = 2$ $p < .038$

Table 11

Contingency Table of Self-Rated MP By Desire to Have More Occupations to Consider

actual tally (column %)	want more occup. to consider	do not want more occup. to consider	total
low MP	6 (15)	5 (7)	11
moderate MP	22 (55)	31 (45)	53
high MP	12 (30)	33 (48)	45
total	40	69	109

chi square = 3.986 $df = 2$ $p < .136$

Table 12

Contingency Table of Self-Rated MP By Sex

actual tally (column %)	male	female	total
low MP	9 (13)	2 (5)	11
moderate MP	34 (49)	20 (49)	54
high MP	26 (38)	19 (46)	45
total	69	41	110

chi square = 2.188 $df = 2$ $p < .335$

subjects, while the opposite occurred for low MP subjects. Five variables did not reach significance: sex, summer school attended in 1984, spontaneously describing a career decision-making problem dealing with overchoice, being worried that present interests may change, and wanting more occupations to consider. This last variable, however, did indicate a tendency towards high MP subjects not wanting more occupations to consider, while low MP subjects did want more occupations to consider (see Table 11). Therefore, career-related concerns were not significantly related to multipotentiality level, and neither was sex. Again, though, there was a tendency in the sex by multipotentiality table, for females to be more multipotentialed than male (see Table 12). Diversity of interests was also found to be greater for women than men in the previously referred to Gaeddert and Hansen (1993) study.

An additional ten contingency tables, in which the number of cells with expected values of less than five was greater than 20%, were examined for trends related to level of multipotentiality. No such trends were found for the affect associated with three variables: having more than one career choice at the same time, and self-rated MP for the present and for 1984. Neither were trends found for information contained in the elaborations requested about one's self-rated MP for the present and for 1984. In both cases, the majority of elaborations referred to interests rather than ability, but in neither case were differences between multipotentiality level noted. As previously mentioned, the ethnicity variable was confounded, and most of the cells in this contingency table had expected values of less than five, thus it was not possible to note potential relationships between parental heritage and MP level. There was, however, a tendency for the low MP subjects to have less positive parental-rated attitudes toward school in 1984 (see Table 13).

Table 13

Contingency Table of Self-Rated MP By Inferred Attitude Towards School in 1984

actual tally (row %)	negative	neutral	positive	total
low MP	2 (25)	4 (50)	2 (25)	8
moderate MP	5 (12)	7 (17)	29 (70)	41
high MP	8 (25)	5 (16)	19 (59)	32
total	15	16	50	81

Three last contingency tables dealing with the classification of subjects' interests by Holland (1985) type also contained trends to be examined in further investigations. In Table 14, subjects are separated by MP level and their primary Holland classification (Holland theme with the highest GOT score) from the 1984 SII. In this table, there are fewer Investigative types rated as high MP and more rated as moderate MP than was expected. Similarly, in Table 15 in which 1993/94 SII Holland classification is presented, there are more low MP Investigative types than expected. Although research concerning Holland type and interest diversity is inconclusive, previous investigators have found the Investigative type to have lower diversity of interests (Campbell, 1971). As well, the tendency for Investigative types to be less multipotentialed helps to explain why Children's Science Curiosity scores from 1984 did not increase with MP level as did other measures of curiosity: The Investigative types had the highest Science Curiosity scores, but since they tended to be less multipotentialed, Science Curiosity scores thus tended to decrease with increases in multipotentiality. In Table 15, a tendency for Artistic types to have the highest MP levels is also noted.

In Table 16, subjects are classified by the primary Holland classification of their present career goals. As can be seen, the six subjects whose goals were not categorized into a Holland type, were all rated as moderate or high MP. This is not surprising as those subjects either did not report any present career goals (due to confusion with career decision-making) or their goals were too diverse to categorize under a single Holland theme. In this table there is also a tendency for those with Investigative career goals to be high rather than moderate MP. Is diversity one of the characteristics of Investigative careers? There is also a trend for those with Social career goals to be rated as moderate rather than high MP. Thus it seems that the career goals one strives for may be affected by one's degree of multipotentiality. Further research is necessary, however, before any conclusions can be made.

It therefore appears that subjects differing in level of MP also differ significantly on several related variables. Higher MP subjects were found to have higher verbal IQ scores, to be more extraverted, to have more favourable attitudes towards learning, and to come from families of higher SES. Possibly, females may be more multipotentialed than males. Higher MP subjects rated themselves as having greater variety of interests and ability, as participating in more leisure activities, and as having had more than one career choice in mind at one time. They also had stronger interests on the 1993/94 SII, especially in the realms of leisure activities and school subjects.

Table 14

Contingency Table of Self-Rated MP By 1984 Primary Holland Classification

actual tally (column %)	Realistic	Investig.	Artistic	Social	Enterpr.	Convent.	total
low MP	3 (23)	1 (6)	1 (10)	0 (--)	0 (0)	2 (20)	7
moderate MP	6 (46)	11 (65)	4 (40)	0 (--)	5 (45)	3 (30)	29
high MP	4 (31)	5 (29)	5 (50)	0 (--)	6 (54)	5 (50)	25
total	13	17	10	0	11	10	61

Table 15

Contingency Table of Self-Rated MP By 1993/94 Primary Holland Classification

actual tally (column %)	Realistic	Investig.	Artistic	Social	Enterpr.	Convent.	total
low MP	1 (7)	5 (19)	3 (9)	1 (6)	0 (0)	1 (11)	11
moderate MP	9 (60)	12 (46)	13 (37)	11 (65)	4 (57)	5 (56)	54
high MP	5 (33)	9 (35)	19 (54)	5 (29)	3 (43)	3 (33)	44
total	15	26	35	17	7	9	109

Table 16

Contingency Table of Self-Rated MP By Holland Classification of Present Career Goals

actual tally (column %)	unclear	Realistic	Investig.	Artistic	Social	Enterpr.	Convent.	tot
low MP	0 (0)	2 (12)	4 (12)	2 (13)	3 (14)	0 (0)	0 (0)	11
moderate MP	3 (50)	9 (56)	11 (33)	7 (47)	14 (67)	9 (56)	1 (33)	54
high MP	3 (50)	5 (31)	18 (54)	6 (40)	4 (19)	7 (44)	2 (67)	45
total	6	16	33	15	21	16	3	11

Outcomes of Multipotentiality

Evidence for the effect of MP level on such things as general well-being, satisfaction, and career-choice difficulties is basically nonexistent. In this sample, degree of multipotentiality does not seem to have led to differential outcomes. None of the correlations or ANOVAs between MP level and the outcome-related variables was significant. Based on a review of the relevant giftedness literature, it was expected that as MP level increased, positive outcomes would decrease. This trend was noted in just two of the correlations in Table 7: Vocational Identity (VI) Scale scores and difficulty of career decision-making. The other outcome variables, which were more affective than cognitive in nature (affect during career decision-making, confidence that an enjoyable career will be found, and satisfaction with career, self, and life) were positively related to degree of multipotentiality. The relevant ANOVA data from Table 9 show this same pattern of results: The high MP group had slightly lower VI Scale scores and more difficult career decision-making, but more positive affect during career decision-making and more confidence that a career would be found which would make them happy. Again, none of these trends was significant, but the possibility exists that for high MP subjects, more difficult career decision-making and positive outcomes are not incompatible. Thus it may be that multipotentiality is actually beneficial, despite the overchoice it can produce.

There was a tendency, shown in Table 11, for high MP subjects not to want more occupations to consider; and as shown in Table 10, high MP subjects were more likely ($p < .05$) than low MP subjects to have had more than one career choice at the same time. Despite this, a contingency table in which MP level and the effect of having had more than one choice in mind at the same time (inferred affect) revealed no trend for high MP subjects to have less-positive outcomes. Nor was such a trend between MP level and outcome observed for self-rated MP level and the affect associated with it. In this sample, it does not appear that higher levels of MP lead to more negative outcomes, as is commonly repeated in the giftedness literature. In fact, there appears to be little relationship between MP level and outcomes. This could, however, be due to the developmental level of the sample. Perhaps because the subjects are basically going through the same general experiences--attending post-secondary institutions and making career decisions--no differential effects of multipotentiality on "successful" outcomes is apparent. Such effects may emerge in a few years, when the subjects have completed their schooling and entered the job-market full-time. The restricted range of the sample on variables such as multipotentiality, SES, and verbal IQ also makes it difficult to draw conclusions concerning the relationship of multipotentiality to psychological "success."

Normative scores provided for college students on the VI Scale, which is believed to provide a general measure of psychological health (Holland et al., 1993), are lower than those obtained by the present sample--across all three levels of MP (see Table 17). As the present sample is generally quite multipotentialed, it thus appears that multipotentiality leads to favourable outcomes. Furthermore, if a negative outcome is arbitrarily defined as scoring below the mean of the college-level normative sample, only 46.4% of the males and 48.8% of the females in the present sample would be thus rated. When the sample is divided into subgroups by MP level, the high MP group remains more "successful" than the norm group. Interestingly, the most "successful" female subjects were in the high MP group, while the most "successful" male subjects were in the low MP group. For both sexes, the least "successful" subjects were in the moderate MP group. Further research into the interactions between MP level, sex, and "success" are needed. Overall, however, multipotentialed subjects are not suffering more ill-effects, as measured by the VI Scale, than their nonmultipotentialed counterparts. It seems that multipotentiality, at least for this sample, is not problematic.

Table 17

Relative VI Scale Outcomes of the Present Sample By MP Level

Sample	Sex	Mean	*SD*	*n*	% of Subjects Scoring Below Mean of Norm Group
college-level norms	f	10.13	4.23	122	50.0
	m	11.25	4.14	121	50.0
present sample	f	10.98	4.73	41	48.8
	m	12.01	4.78	69	46.4
--high MP subgroup	f	11.32	4.04	19	36.8
	m	12.00	4.95	26	46.2
--mod. MP subgroup	f	10.70	5.31	20	60.0
	m	11.71	4.80	34	52.9
--low MP subgroup	f	10.50	7.78	2	50.0
	m	13.22	4.58	9	22.2

Lastly, there may be interactions between VI Scale scores and primary Holland (1985) type from the 1993/94 SII, related to the multipotentiality levels of the different types. Table 15 displays a tendency for Investigative and Social types to be less multipotentialed than expected while Artistic types are more multipotentialed. Table 18 displays a tendency for Investigative, Social, and Enterprising types to score higher on the VI Scale while Artistic, Realistic, and Conventional types obtain lower scores. These contingency tables had too few cells with expected frequencies of five, to allow for chi-square analysis, and splitting the contingency table of VI Scale score by type (see Table 18) into three based on MP level resulted in contingency tables with too few subjects per cell to draw conclusions about the effect of type on VI Scale scores at different levels of multipotentiality. It did not appear, however, that certain types responded more favourably to multipotentiality than other types. Instead, it appears that certain types (Investigative and Social) are less multipotentialed and this elevated their VI Scale scores, while other types (Artistic) are more multipotentialed and this decreased their VI Scale scores. Therefore, the relationship between MP level and outcomes needs further investigation, taking Holland type into account. Perhaps it is type, rather than multipotentiality, which predisposes one towards more or less favourable psychological outcomes.

Evidence gathered from the present sample does not show multipotentiality to be problematic, as is often suggested in the giftedness literature. This could be due to the fact that the subjects are presently in the midst of career decision-making and ill-effects of multipotentiality are masked. Or it could be because multipotentiality does not, in fact, have a negative effect on most individual's career deciding. Further research with an older

Table 18

Contingency Table of VI Scale Scores By 1994 Holland Type

actual tally (column %)	Realistic	Investig.	Artistic	Social	Enterpr.	Convent.	total
low VI score	7 (47)	6 (23)	14 (39)	3 (18)	1 (14)	5 (56)	36
medium VI score	3 (20)	8 (31)	10 (28)	7 (41)	3 (43)	2 (22)	33
high VI score	5 (33)	12 (46)	12 (33)	7 (41)	3 (43)	2 (22)	41
total	15	26	36	17	7	9	110

sample could help to clarify this situation. Type should be taken into account, as there appears to be a tendency for certain types to be more multipotentialed, and perhaps less "successful," than other types. Broader measures of "success" are also needed.

Moderators of Multipotentiality and "Success"

Several methods of analysis were used to investigate the relationship between 41 career-related moderating experiences (recommended in the giftedness literature as aids to gifted youth in career decision-making--see Appendix C) and the benefits derived from them, "successful" outcomes as measured by VI Scale scores, and MP level. First, correlations between experience with and benefit from each of the 41 moderator variables were done on the entire group ($n = 111$). All 41 correlations were significant ($p < .01$) and quite strong ($M = .702$). Then the group was split into three, based on VI Scale scores. All correlations for the high VI group ($n = 41$) were significant ($p < .01$) and even stronger ($M = .762$). For the medium VI group ($n = 34$), 38 correlations were significant at the .01 level and two were significant at the .05 level, with the average correlation being .699. For the low VI group ($n = 36$), 33 correlations were significant at the .01 level and three were significant at the .05 level, with the average correlation being .605. In general, amount of experience with a particular moderator variable was quite strongly related to the benefit derived from that experience. This pattern is strongest for the high VI group, indicating that those who are more "successful" are more able to benefit from experiences related to career decision-making.

Next, the mean scores for the high VI group ($n = 40$) on each of the 41 moderating experiences and benefits were examined, and scores greater than 2 are shown in Table 19. As the variables were rated on four-point scales ranging from 0 ("none") to 3 ("lots"), a score of 2 ("some") was considered to indicate a certain magnitude of experience/benefit. The resulting ten experiences and six benefits are thus the most important of the 41 moderator variables for the high VI group (see Appendix B for a complete list of the moderator variables). Perhaps these factors helped to make the high VI group the most "successful" group. Because actual benefit, rather than just experience, is probably more important as an aid to career decision-making, these six high ranking variables will be considered. It seems that "successful" subjects have benefited through their course experience in both a wide variety of courses and in courses within their field of interest. They have also been very active internally, visualizing themselves in possible future careers, weighing pros and cons of different careers, prioritizing and focusing interests and abilities, and making choices and decisions about career options. While the

high VI group also experienced informal career-oriented discussions with family and peers, had exposure to a variety of leisure activities, and kept their options open, these variables were not rated as most highly beneficial. Thus it appears that course experience and active career-planning and decision-making were important factors aiding in the "success" of the high VI group.

Table 19

Highest Ranking Moderator Variables for High-Scoring VI Group*

Experience with . . .			Benefit from . . .		
Moderator Variable	Mean for High VI Gp.	*n*	Moderator Variable	Mean for High VI Gp.	*n*
visualize self in future job	2.54	39	actively make career choices	2.44	39
actively make career choices	2.47	38	visualize self in future job	2.42	38
weigh pros & cons of careers	2.32	38	prioritize int. & abilities	2.28	39
prioritize int. & abilities	2.29	38	courses in field of interest	2.23	39
career discuss. w/ parents	2.21	38	weigh pros & cons of careers	2.13	39
different school courses	2.20	40	different school courses	2.03	39
courses in field of interest	2.20	40			
career discuss. w/ peers	2.16	38			
keep options open	2.15	40			
variety of leisure activities	2.05	38			

* Mean score > 2 (on a four-point scale ranging from 0 "none" to 3 "lots."

In order to see if any factors specifically differentiated between those high MP subjects who are most "successful" and those who are less so, the ANOVA procedure was utilized for each of the 41 moderating experiences and benefits. Within the high MP group ($n = 45$), three subgroups were formed based on VI Scale score level, and the mean scores for each of these three subgroups were thus compared. The eight experiences and six benefits which reached significance ($p < .05$) are shown in Table 20. For these 14 variables, Student-Newman-Keuls multiple comparisons were done to determine exactly where the significant differences lay.

High and medium-scoring VI subjects reported more experience with prioritizing and actively making choices. Course experience in a field of interest was also positively related to VI level. Interestingly, it was the medium VI group which reported the most experience with shadowing and interviewing someone in a field of interest. Less proactive experiences--discussing the jobs of parents and realizing career decision-making can be frustrating and on-going--were reported most often by the low VI group. Was this group rationalizing their lack of "success" in the realm of career decision-making? Or did their lack of active decision-making lead to their lack of "success"? As far as benefits are concerned, the high VI group did not score significantly higher than the low VI group on any of the 41 variables, therefore it is difficult to recommend certain experiences as beneficial for the career decision-making of high MP individuals. The medium VI group was highest on shadowing and interviewing someone in a field of interest, as well as receiving career guidance outside of school. This group appeared to be the most active in their career deciding. Again, the low VI group benefited most from discussing the jobs of parents and others with them.

It appears that experiences related to career planning were beneficial for most subjects. Exposure to courses in school seems to have been quite helpful, as were various means of active planning and decision-making. Experiences and benefits within the high MP group related to differential outcomes were not particularly revealing. No experiences stood out as highly beneficial to high MP subjects, although it appears the more "successful" of these subjects were much more active in their career planning than were the less "successful" subjects who spent more time conceptualizing career deciding as an on-going and possibly frustrating process. Further research is needed to see how attitude toward and methods utilized in the career decision-making process affect and are affected by both degree of multipotentiality and degree of success of the career planning process.

Table 20

Significant Moderator Variable Differences By VI Scale Score for the High MP Group

E/B	Variable	Mean (*SD*)			*F*	*df*	*p* <	groups differing*
		low VI	med VI	high VI				
E	prioritize & focus interests & abilities	1.714 (0.914) *n* = 13	2.462 (0.776) *n* = 14	2.333 (0.724) *n* = 15	4.940	2, 39	.044	low/high
E	actively make career choices & decisions	1.429 (0.852) *n* = 14	2.385 (0.768) *n* = 13	2.333 (1.047) *n* = 15	4.940	2, 39	.012	low/med low/high
E	gain course experience in field of int.	1.600 (1.121) *n* = 15	2.071 (0.917) *n* = 14	2.500 (0.516) *n* = 16	4.049	2, 42	.025	low/high
E	shadow one doing job of interest	0.067 (0.258) *n* = 15	1.071 (1.072) *n* = 14	0.750 (0.856) *n* = 16	6.032	2, 42	.005	low/med low/high
E	interview one in field of interest	0.667 (0.724) *n* = 15	1.286 (1.069) *n* = 14	0.312 (0.873) *n* = 16	4.479	2, 42	.017	med/high
E	discuss parents' jobs with them	1.909 (0.831) *n* =11	2.071 (0.829) *n* = 14	1.214 (0.699) *n* = 14	4.625	2, 36	.016	low/high
E	realize career decision-mak. can be frust.	2.929 (0.267) *n* = 13	2.538 (0.660) *n* = 14	1.533 (1.246) *n* = 15	10.545	2, 39	.000	low/high med/high
E	view career decision-mak. as ongoing	2.714 (0.469) *n* = 13	2.231 (1.092) *n* =14	1.800 (1.014) *n* = 15	3.740	2, 39	.033	low/high
B	shadow one doing job of interest	0.067 (0.258) *n* = 15	1.154 (1.214) *n* = 13	0.600 (0.737) *n* = 15	6.284	2, 40	.004	low/med

B	play dress-up & explore career fantas.	0.909 (1.044) $n = 11$	0.214 (0.579) $n = 14$	0.929 (0.829) $n = 14$	3.327	2, 36	.047	med/high
B	receive career guidance outside school	0.846 (0.899) $n = 13$	1.786 (1.122) $n = 14$	0.800 (1.014) $n = 15$	4.191	2, 39	.022	low/med med/high
B	interview one in field of interest	0.600 (0.737) $n = 15$	1.462 (1.198) $n = 13$	0.267 (0.704) $n = 15$	6.562	2, 40	.003	low/med med/high
B	discuss jobs of parents' w/ them	1.909 (0.994) $n = 11$	1.214 (1.051) $n = 14$	0.786 (0.893) $n = 14$	4.182	2, 36	.023	n.s.
B	discuss jobs of others' w/ them	1.636 (0.809) $n = 11$	1.786 (0.975) $n = 14$	0.786 (0.699) $n = 14$	5.680	2, 36	.007	low/high

Note. "E" refers to experience with the moderator variable, while "B" refers to benefit obtained from that variable.

* Based on analysis with Student-Newman-Keuls multiple comparisons.

CHAPTER 4: CONCLUSIONS

General Conclusions

The research questions that provided a framework for this study will be used to summarize this investigator's findings. In some cases these findings support previous assertions made about multipotentiality; in other cases, controversial evidence has emerged, requiring further investigation. First, the majority of this sample do appear to be multipotentialed, providing evidence in support of Davis and Rimm's (1989) and Milgram's (1989) contention that most gifted individuals are indeed multipotentialed. A full 90% of the subjects rated themselves as being multipotentialed after reading the expert-validated definition of the concept that was provided. Data collected in 1984 indicate that multipotentiality was present at that time, although perhaps to a lesser degree. The 1984 Strong Interest Inventory (SII) data do not, however, support this hypothesis. Many measures calculated from the 1993/94 SII scores also failed to correlate significantly with multipotentiality for this sample. Furthermore, the SII scores were lower than those reported for the normative sample: The high, flat profiles reported to be characteristic of multipotentialed gifted students (Fox, 1978; Hansen, 1992; Rothney, 1972) appeared only rarely. Thus it does not appear as though the SII provides a useful measure of multipotentiality. Likewise, neither the theoretically related Gaeddert-Hansen (1993) measure of interest diversity nor Holland's (1985) measures of differentiation and consistency were able to identify multipotentialed subjects. Interest measures do not seem able to provide valid measures of the phenomenon of multipotentiality.

Second, degree of multipotentiality was correlated more strongly with self-rated variety of abilities than with self-rated variety of interests, although interests were more frequently mentioned by those subjects who elaborated upon their self-ratings of multipotentiality. Thus it remains unclear which of these factors contribute more to the phenomenon of multipotentiality. Opportunity seems to play a role, as 90% of the subjects rated themselves as having a variety of available opportunities and as 72% of the subjects came from high SES homes. The fact that SES was significantly correlated with multipotentiality may be explained by the increased number of experiences available to the higher SES subjects. Such experiences could have stimulated interests directly through exposure or indirectly through the opportunity to develop abilities which made subsequent participation in activities more rewarding. Likewise, personality characteristics may have been derived--whether genetically or through learning--from these high SES home environments, which in turn contributed to the development of multipotentiality. The

more multipotentialed subjects were found to have high verbal IQ scores, to have a positive attitude towards school, to be curious, and to be more extraverted. It therefore seems that a motivation to learn and interact with the environment accompanies multipotentiality. This motivation may be what drives an individual to develop a diversity of interests and abilities. Such a love of learning has been previously reported as being characteristic of gifted individuals (Delisle & Squires, 1989; Ehrlich, 1982; Silverman, 1993) and as having been demonstrated through research (Massé & Gagné, 1983). Multipotentiality appears to be present in both the avocational and vocational realms, although it may be somewhat restricted in the vocational realm due to the narrowing nature of career decision-making.

There also appears to be some interaction of Holland (1985) type and multipotentiality. Investigative types tended to be less multipotentialed, while Artistic types tended to be more multipotentialed. While some previous data indicate that Investigative types have a low diversity of interests (Campbell, 1971) and Artistic types have a high diversity of interests (Holland et al., 1991), other data have been reported the opposite (Campbell, 1971; Holland et al., 1991). Holland postulated that Artistic and Investigative types are more open to experience, and Hansen (1992) added that Investigative types may be more troubled by multipotentiality as they can be successful in so many areas that they may not want to limit their options. However, not only were Investigative types found to be lower in multipotentiality level, they were also found to score higher on the Vocational Identity (VI) Scale, while more multipotentialed Artistic types were found to score lower on the VI Scale. Perhaps this can be explained by the fact that Holland et al. (1975) found Investigative types to be the best decision-makers. Type may affect both degree of multipotentiality and outcome of multipotentiality.

Third, for most individuals in this study, multipotentiality did not appear to be a problem, despite the fact that Kerr (1981a) labeled multipotentiality the most common career problem of gifted youth. Evidence for the career indecision reported in the literature as accompanying multipotentiality (Milgram, 1991; Sanborn, 1974), and even included in Delisle and Squire's (1989) definition of multipotentiality, was not found. While there was a tendency for VI scores and ease of decision-making to decrease with increases in multipotentiality, the opposite trend was found for several more affective measures such as degree of satisfaction. And, VI scores for the entire group, as well as for the high multipotentialed subgroup, were higher than reported norms.

Fourth, the effort to differentiate between the experiences of "successful" and less "successful" multipotentialed subjects, in order to identify any factors which may aid

multipotentialed individuals in their career decision-making, had limited success: Limited in the sense that few such factors were found; successful in the sense that evidence, for many of the factors reported in the giftedness literature as being beneficial for the gifted in their career decision-making, was not found. Most of the anecdotally recommended career-related experiences did not hold up in this empirical study. The realization that career decision-making takes time and may be frustrating was found to be characteristic of the least "successful" of the high multipotentialed subjects. While it is unlikely that such thinking actually leads to career indecision, neither does such an approach make career decision-making easier. Instead, the active stance of prioritizing and focusing interests and making decisions was found to be characteristic of the most "successful" high multipotentialed subjects. Again, however, direction of causality is unclear. Experience in school courses, but not experience with leisure activities, was found to be beneficial. Neither career guidance, having a mentor, value exploration, nor visualizing oneself in potential future careers was found to be of much benefit. Interviewing and shadowing persons in a field of interest was found to be beneficial for the moderate "success" group, but not for high "success" group. Finally, discussing the jobs of parents and others with them was found to be characteristic of the low "success" group rather than the high "success" group. Unfortunately these findings do little in the way of illuminating particularly beneficial experiences which moderate the relationship between multipotentiality and "success." Perhaps this is because motivation is the key to multipotentiality, and the motivation to do and to learn is not affected by these more "superficial" experiences.

Limitations of the Study

This longitudinal study has permitted the examination of multipotentiality over time without having to rely on retrospective reports. Several different types of data have been employed, adding to the validity of the conclusions. These benefits of longitudinal studies were described by Subotnik and Arnold (1994), along with the chief problems of such studies: attrition, the use of a single cohort, and lack of control group. Attrition was not overly problematic for this study, as 73% of the original 1984 sample was recontacted.

The main limitation of this study lies with the choice of sample. The subjects were gifted, had high verbal IQs, came from high SES homes, and were for the most part striving towards professional careers. Most were also multipotentialed. These restrictions in range made it more difficult to identify relationships and their strengths. A second sample containing a wider range of subjects (especially nongifted) is needed and would

help to clarify when and why multipotentiality occurs. The subjects were also in the midst of career decision-making, which may have masked both the occurrence of multipotentiality in the vocational realm and its affects on career decision-making, as most of the subjects were trying to narrow options and make choices. Another follow-up should be repeated in 5 to 10 years, once initial career decisions have been implemented, to see whether or not multipotentiality has impacted upon "success" levels.

Two important measures utilized in the study were also limited in scope. The self-rated multipotentiality measure limited responses to a four-point scale. If perhaps a seven-point scale had been utilized, responses may have been more spread out. As well, other measures of multipotentiality, focusing more on actual behaviours, would have been useful and would have increased validity. The main measure of "successful" outcomes--the VI Scale, which has been correlated with many other positive outcomes and has been reported to be a measure of general psychological health (Holland et al., 1993), provided only one indication of "success." Other measures (perhaps of achievement, stability of career choices, satisfaction, and self-concept) could provide a broader view of the effects of multipotentiality.

Implications for Further Research

This study is one of the first attempts to empirically delve into the concept of multipotentiality. While its limitations are many and the findings should not be generalized beyond similar populations, this study has also uncovered a great many questions to be answered by future research. First and foremost, future research must utilize a sample which includes gifted and nongifted subjects from as varied a background as possible. Studies done with subjects of different ages and levels of development would also be useful: adolescence (pre-career deciding), early twenties (midst of career deciding), late twenties (post-career deciding), and thirties (follow-up for longer term effects). The effects of IQ and SES should be taken into account as they have been shown to be related to multipotentiality. Sex, ethnicity, and Holland (1985) type may also be related to multipotentiality, so these different dimensions should be investigated.

The exact nature of multipotentiality still remains unclear and could benefit from further research. Does the opportunity to gain a variety of experiences lead to multipotentiality? Does it facilitate the development of interests or abilities? Is actual ability or simply interest important? Or is the key factor the underlying motivation to engage in a variety of activities? Is such a motivation more of a need to learn (Jarvis, 1983; Katchadourian & Boli, 1985; Maslow, 1970) or a need for competence or

achievement (Cattell, 1982; Csikszentmihalyi, 1985; Deci, 1975; McClelland, Atkinson, Clark, & Lowell, 1953; Piaget & Inhelder, 1969)? What other personality characteristics accompany multipotentiality--for example, Openness to Experience (McCrae & John, 1992) or Intuition (Myers, 1985)?

More studies of the relationship between multipotentiality level and outcomes are needed. Both this study and a recent investigation by Emmett and Minor (1993) failed to find widespread evidence for the career indecision reputed to accompany multipotentiality. Has multipotentiality become less problematic in the past twenty years since researchers at the University of Wisconsin's Research and Guidance Laboratory for Superior Students (Rothney, 1972) first started describing the career indecision that can accompany it? Have empirical studies challenged anecdotal evidence and found it to be exaggerated?

Further empirical research, utilizing better measures of multipotentiality and outcomes are needed. The lack of strong relationship between SII scores, and measures derived from these scores such as the Gaeddert-Hansen (1993) diversity measure and Holland's (1985) differentiation and consistency measures, also requires further investigation. Why are the theoretically similar concepts of multipotentiality and low differentiation (as well as consistency and vocational identity) not found to be empirically related? Is there a problem with how some of these concepts are measured? If the key to multipotentiality is found at the motivational level, such measures may be inadequate as they are not tapping into such motivations. Perhaps multipotentiality only really becomes noticeable (and hence becomes reported anecdotally) when motivation levels and opportunity are so high as to encourage one to participate in more activities (both avocational and vocational) than is possible due to limitations of time and other resources. Thus multipotentiality may be "dormant" (as in most of this sample) or exhibited as the much talked about "overchoice" syndrome.

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Appendix A

Further Self-Descriptions from Multipotentialed Youth

"When I look for a career in my future, the clouds really thicken. There are so many things I'd like to do and be, and I'd like to try them all; where to start is the problem . . . . I'd like to be a physical therapist, a foreign correspondent, a psychiatrist, an anthropologist, a linguist, a folk singer, an espionage agent, and a social worker." (Sanborn, 1974, p. 105)

"I have found that if I apply myself I can do about anything. I don't seem to have a serious lack of aptitude in any field. I find an English assignment equally difficult as a physics problem. I find them to be equally challenging and equally as interesting. The same goes for mathematics, social studies, music, speech, or any other subject area . . . . This is why I find it so difficult to decide on my place in the future. Many people do not consider this much of a problem, but to me, this lack of one area to stand out in is very grave indeed." (Rothney, 1972, p. 79)

"I'm sick of the whole idea of making a career decision or choosing a college major! . . . I would really like to . . . live in the 16th century and be a Renaissance Man. Then I could be a philosopher, an actor, a poet, a priest, a teacher, a psychiatrist and so many other things--but my century won't let me be everything." (Marshall, 1981, p. 306)

"I expect to go to college, but I have no career plans now. I don't have any plans because I have too many things I like to do and I am good at. Some people are only good at one special thing, and I am good in many areas." (Delisle, 1984, p. 107)

"It feels like I'm being pulled in a bunch of different directions . . . . No matter what I'm doing, everything else looks interesting, which is not to say what I'm doing doesn't look interesting, but there's a newness with everything else . . . it's real hard for me. And my biggest fear is being able to do only one thing . . . for the rest of my life." (Emmett & Minor, 1993, p. 361)

"I was raised in an atmosphere that placed no external limitations on what I could (or should) do with my life. I never felt that I shouldn't aspire to an occupation . . . because I didn't have the intelligence or aptitude for it. This influence . . . has to some degree made vocational decision making more difficult for me. I have been programmed since childhood that I could do anything I set my mind to." (Pask-McCartney & Salomone, 1988, p. 234)

Appendix B

Instruments Utilized in the Present Study

which are Either Unpublished or Difficult to Obtain

(1) 1993/94 Telephone Interview

- -- Introductory Explanations
- -- Contact Sheet (for purposes of a second follow-up)
- -- nine multi-part Interview Questions

(2) 1993/94 Mailed Questionnaire Packet

- -- Transmittal Form
- -- Consent Form
- -- Questionnaire -- Section 1: Demographics
  - -- Section 2: Career Planning Experiences
  - -- Section 3: Satisfaction
  - -- Section 4: Breadth
  - -- Section 5: Leisure Interests
  - -- Section 6: Multipotentiality

(3) 1984 Instruments (used in present study)

- -- Creative Activities Checklist
- -- Children's Science Curiosity Scale
- -- School Sentiment Index
- -- Child Information (from Parental Questionnaire)

(1) 1993/94 Telephone Interview

INITIATING TELEPHONE CONTACT

"Hello, my name is _____, and I am calling from McGill University. I am a graduate student in Educational Psychology and I am part of a research team. We are contacting all of the participants from the 1984 McGill Gifted Summer School as part of a follow-up study."

"We are asking people to participate in a telephone interview and to fill-out a questionnaire that we will be mailing. We are seeking information for projects on the career planning of gifted adolescents, the causes of withdrawl from French Immersion, the games gifted adolescents prefer, and the long-term impact of the McGill Gifted Summer School."

"I would very much like to ask you several questions that would require approximately 20 minutes of your time to answer. Is this a good time for you?"

IF THE RESPONDENT CANNOT PARTICIPATE AT THIS TIME, INQUIRE AS TO TIME, DATE, AND TELEPHONE NUMBER WHEN A SECOND CONTACT CAN BE MADE

IF THE RESPONDENT CAN PARTICIPATE AT THIS TIME, CONTINUE....

"Before we start, I would like you to know that you are free to refuse to participate at any time, but that I would really appreciate your cooperation. Also, you should know that your responses will be used solely for research purposes and will be held in strict confidence."

"May I begin the interview?"

CONDUCT INTERVIEW (separate pages for each subject)

TERMINATING TELEPHONE CONTACT

"Thank you very much for your time--I really appreciate it!"

"May I now send you a questionnaire package for you to fill-out and return to me as soon as possible? The questionnaires would take another 20 minutes or so of your time, and I will enclose an addressed and stamped return envelope. I would appreciate it if you could get the questionnaires back to me within a week if possible."

"Lastly, before I let you go, would you know where I could contact anyone else who was at the McGill Gifted Summer School in 1984?"

WRITE DOWN ANY NAMES, PHONE NUMBERS, ADDRESSES

1993 Contact Addressees for Subjects in Longitudinal Study

"The first thing I would like to ask you is some basic contact information."

Subject Number: _____

Family Name: _____ First Name: _____

Present Phone Number: _____ (home)

_____ (work)

_____ (school)

_____ (other)

Present Address: _____

_____

_____

Permanent Contact #1: relation to subject_____

phone_____

address_____

_____

Permanent Contact #2: relation to subject_____

phone_____

address_____

_____

K's Telephone Interview Questions SUBJECT:_____

"Now I would like to ask some questions which will help me to learn about what career planning you have done so far. There are 9 multi-part questions, which should take no more than 15 minutes to answer. Please answer these questions as best you can, and ask for clarification if you are not sure what is being asked. Remember, you do not have to answer any questions if you don't want to."

1) (a) On a scale from 1 to 5, how would you describe your career planning, if 1 is "I just let things happen" and 5 is "I made a series of conscious choices"?

1 2 3 4 5

(b) On a scale from 1 to 5, how difficult has your career decision-making been, if 1 is "very easy" and 5 is "very difficult"?

1 2 3 4 5

(c) On a scale from 1 to 5, how does thinking about potential careers make you feel, if 1 is "really bad" and 5 is "really good"?

1 2 3 4 5

2) (a) Please <u>list</u> any career aspirations or goals you had in elementary school.

(b) Please <u>list</u> any career aspirations or goals you had in high school.

(c) Please <u>list</u> any career aspirations or goals you have had since high school.

3) (a) How did each of your particular career aspirations come into being--how did you come to be interested in each of your career goals?

(b) How, if at all, did you come to discard each of your previous career aspirations--how did you come to stop being interested in each of your career goals?

4) (a) Did you ever have more than one career choice in mind at the same time? yes_____ no_____ When and which ones?

(b) How did this affect your thinking and feeling about careers?

5) (a) What, if any, are your present career aspirations or goals?

(b) Are you still considering several options or have you narrowed your choice down to a single option?

several options_____ single option_____

Could you please elaborate?

(c) On a scale from 1 to 5, how confident are you that you have or will successfully select a career in which you will be happy, if 1 is "I will never find a satisfying career" and 5 is "I know I will find a satisfying career"?

1 2 3 4 5

Could you please elaborate?

6) (a) What, if any, problems have <u>ever</u> arisen in your career planning process ?

(b) How, if at all, did you overcome these problems?

7) (a) What, if any, particular experiences really helped your career planning process? Could you please elaborate?

(b) Which, if any, people really helped your career planning process? Could you please elaborate?

8) Compared to your peers and other people you know, would you describe your career decision-making process as usual or in some way different? Could you please elaborate?

9) (a) What, if any, useful career guidance did you receive in high school? Could you please elaborate?

(b) What, if any, "unuseful" career guidance did you receive in high school? Could you please elaborate?

(c) What career guidance would you have liked to have received in high school?

(d) What recommendations would you make to improve high school career guidance?

(2) 1993/94 Mailed Questionnaire Packet

McGill

Department of Educational Psychology and Counselling

Faculty of Education
McGill University

3700 McTavish Street
Montreal, Quebec, Canada
H3A 1Y2

Tel.: (514) 398-4240
Fax: (514) 398-6968
Telex: 05 268510

Dear

The following questionnaires form part of a group of studies being conducted at McGill University by members of the Department of Educational and Counselling Psychology. Your participation will provide information for projects on the career planning of gifted adolescents, the causes of transfer out of French Immersion programs, the games gifted adolescents prefer, and the long-term impact of the McGill Gifted Summer School.

Would you please complete and return the enclosed forms prior to _____, using the enclosed stamped envelope. Your responses will be held in strict confidence.

Please make sure that you enclose both the CONSENT FORM and the SURVEYS and send to:

Kathy Rysiew and Susan Karovitch
c/o Bruce Shore
Faculty of Education
McGill University
3700 McTavish
Montreal, Quebec
H3A 1Y2

Thank you in advance for your time, and feel free to contact us at 398-4252 (leave message), if you have any questions.

Sincerely yours,

Kathy Rysiew (graduate student) Kathy Rysiew

Susan Karovitch (graduate student) Susan Karovitch

Prof. Bruce Shore Bruce M. Shore

Prof. Andrew Carson Andrew Carson

CONSENT FORM

I, _____ , agree to participate in this group of studies being conducted at McGill University by members of the Department of Educational and Counselling Psychology (Kathy Rysiew, Susan Karovitch, Bruce Shore, & Andrew Carson) on the career planning of gifted adolescents, the cause of transfer out of French Immersion programs, the games gifted adolescents prefer, and the long-term impact of the McGill Gifted Summer School.

Participation includes a telephone interview and answering the questions found on the following pages, and will require approximately 1 1/2 hours. I can leave questions unanswered or withdraw from the study at any time.

All answers will be treated with confidentiality, and names of participants will not be disclosed.

Signature: _____

Date: _____

**If you are under the age of eighteen,
a parent/guardian must also sign here:
Signature: _____

SECTION 1: DEMOGRAPHICS Subject Number: _____

Family Name: _____ First Name: _____

Birthdate: year_____ month_____ day_____

Sex: male_____ female_____

Ethnic/Cultural Background: _____

Highest Education Level Completed: _____

Program/Major in School: _____

Presently Attending School: yes_____ no_____

Father's Primary Occupation: _____

Mother's Primary Occupation: _____

Mother Tongue: English_____ French_____ Other (specify)_____

Languages Spoken/Written: English_____ French_____

Other (specify)_____

SECTION 2: CAREER PLANNING EXPERIENCES

Subject Number: _____

Consider your entire life, and do your best to rate how much experience you had with a particular activity and how much that experience helped your career decision-making progress. If you had no experience with a particular activity, it would follow that your career decision-making did not benefit from that activity (choose "none" in both columns). There is extra space at the bottom of the list for you to add any other activities that you can think of which benefitted your career decision-making.

	experience with this activity				benefit for career decision-making			
	none	little	some	lots	none	little	some	lots
received career guidance in elementary school								
received career guidance in high school								
received career guidance in post-secondary institute								
received career guidance outside of school								
participated in career-planning workshop								
visited and talked with career counsellor								
given interest inventory and had it interpreted								
participated in exploration of preferred values and lifestyle								
visualized self in particular job in the future								
received reassurance that career decision-making is difficult								
participated in a formal discussion about careers with peers								
gained a variety of experience with different school courses								
gained course experience in a field of interest								
kept options open (ex-course selection)								
visited college campuses and classes								
heard guest speakers discuss their lives and careers								
read biographies of famous people								
interviewed someone in a field of interest								
"shadowed" someone doing a job I was interested in								
had a mentor (special adult role model and friend)								
participated in school internships								
did volunteer work in a field of interest								
received a variety of work experience								
received work experience in a field of interest								
combined interests to do or create a job								
played dress-up and explored career fantasies as a child								
was exposed to a variety of leisure activities								
maintained a variety of leisure activities								
discussed parents' jobs with them								
discussed the jobs of others with them								
toured the job sites of parents or others								
practiced setting goals and following through (ex-projects)								
participated in discussions of work and values								
viewed career decision-making as an on-going process								
realized career decision-making could be frustrating and take time								
prioritized and focused interests and abilities								
actively made choices and decisions about career								
thought about possible career and weighed pros and cons								
had informal career-oriented discussions with parents/relatives								
had informal career-oriented discussions with peers								
had informal career-oriented discussions with teachers								

SECTION 3: SATISFACTION Subject Number: _____

1) Please answer the following questions as best you can, by indicating the appropriate response.

	strongly disagree	disagree	neutral or not sure	agree	strongly agree
I basically know who I am and what I like.					
I am generally satisfied with who I am.					
I know what career I want to pursue.					
I know I will find a career I will enjoy.					
I am pleased with my life.					
Things are going quite well.					

	low						high
satisfaction with myself	1	2	3	4	5	6	7
satisfaction with my career decision-making	1	2	3	4	5	6	7
overall satisfaction with my life in general	1	2	3	4	5	6	7

SECTION 4: BREADTH **Subject Number: _____**

1) Please answer the following questions as best you can, by indicating the appropriate response.

	not at all true of me	not really true of me	moderately true of me	very much true of me
(a) I have a variety of abilities.	1	2	3	4
(b) I have a variety of interests.	1	2	3	4
(c) I am <u>not</u> limited in my opportunities (access to school, work, etc.).	1	2	3	4

SECTION 5: LEISURE INTERESTS Subject Number: _____

1) (a) Please list all of the leisure interests/activities/hobbies in which you have been an active participant, in your spare time, over the past year or so.

(b) Please list all of the leisure interests/activities/hobbies that you would have liked to have participated in, in the past year or so, if you had had the time/money/opportunity.

2) Please list all of the leisure interests/activities/hobbies in which you have ever participated, in your entire life.

SECTION 6: MULTIPOTENTIALITY Subject Number: _____

Multipotentiality is the ability and desire to pursue different activities and goals. It is especially evident in the realms of leisure and career decision-making.

One may benefit from the effects of multipotentiality, have a variety of "good" choices, and lead a varied and full life. One may also suffer from the "overchoice" and find decision-making difficult, as it is not possible to do all that one would like to do and is capable of doing.

1) (a) Please read the above definition, decide to what degree this concept of multipotentiality describes you as you are now (in 1993), and circle the most appropriate response.

not at all true of me	not really true of me	moderately true of me	very much true of me
1	2	3	4

(b) Please <u>elaborate</u> in what way this concept does or does not describe you.

2) (a) Please read the above definition, decide to what degree this concept of multipotentiality described you as you were nine years ago (in 1984), when you were at the Gifted Summer School, and circle the most appropriate response.

not at all true of me	not really true of me	moderately true of me	very much true of me
1	2	3	4

(b) Please <u>elaborate</u> in what way this concept did or did not describe you.

(3) 1984 Instruments (used in present study)

CREATIVE ACTIVITIES CHECKLIST

Fine Arts

1. In your spare time in the last two years have you created a work of art such as

_____drawing, painting, sketching

_____sculpture, mobile

_____photographic art

_____cartoons

_____other (please describe)

2. Have you ever had art work exhibited publicly (other than school)?
YES____ NO____ If yes, please describe briefly.

3. Have you ever entered an artistic competition?
YES____ NO____

4. Have you ever won a prize or award for your art?
YES____ NO____ Please describe briefly.

5. Have you ever earned money from your art?
YES____ NO____ If yes, please explain.

Crafts

1. In your spare time over the past two years have you engaged in any of the following crafts?

_____printing (eg. linoleum block, potato prints)

_____weaving (paper,cloth, straw,etc.)

_____textile work such as tie-dye, batik, etc.

_____embroidery

_____pottery, papier maché

_____carving (soap, wood, etc.)

_____metalwork

_____jewelry making

_____other (please describe)

_____making stuffed toys

_____candle making

_____lettering

_____leather work

_____puppet making

2. Have you ever had your crafts on public display?
YES____ NO____ If yes, please describe.

3. Have you ever earned money from your crafts?
YES____ NO____ If yes, please explain.

4. Have you ever had your crafts reported in a newspaper, magazine or book?
YES____ NO____ If yes, please describe.

5. Have you ever won a prize or award for your crafts?
YES____ NO____ If yes, please explain.

Science and Math .....continued

3. Have you ever, of your own choice, entered a science or math competition?
YES____ NO____

4. Have you ever won an award for a science or math project
YES____ NO____ Please describe.

5. Have you ever had your original work in science or math published or given at a convention?
YES____ NO____ If yes, please describe.

Literature

1. In your spare time in the last two years have you written for yourself, family or friends

_____a story or poem

_____an essay or article

_____a play, skit or script (eg. for home movie)

_____in a diary regularly for a month or more

_____several letters to the same person

2. Have you ever

_____had your writing published in a school or club magazine

_____written a regular column in a school or club magazine

_____edited a section of a school or club magazine or yearbook

_____been editor-in-chief of a school or club magazine or yearbook

3. Have you ever had your writing published or given public performance other than for a school or club?
YES____ NO____ If yes, please describe

4. Have you ever entered a writing competition?
YES____ NO____

5.Have you ever won an award for your writing?
YES____ NO____ If yes, please describe.

Performing Arts

1. In your free time in the last two years have you

_____sung in a choir

_____played a musical instrument? Which one(s)?

_____belonged to a dance group

_____acted in a play, puppet show, movie, tv or radio show (including home movies, home video, etc.)

_____made costumes or props for a play, puppet show, tv or radio show, movie, etc.

2. In your spare time in the last two years have you done any of the following for family or friends:

_____written or arranged a musical composition and performed it (or had it performed)

_____made up a dance and performed it

_____organized a puppet show, play, tv or radio show, home movie, etc.

_____produced sound effects for a play, show, movie, etc.

_____designed costumes or props for a play, show, movie, etc.

3. Have you ever had a public performance of any of the the activities listed in question 2?
YES____ NO____ If yes, please describe briefly.

4. Have you ever won an award for any of the the activites listed in question 2?
YES____ NO____ If yes, please describe briefly.

5. Have you ever made money from any of the activities listed in question 2?
YES____ NO____ If yes, please describe briefly.

Home Activities

1. In the last two years in your spare time have you

____made clothing, cushions, bedspreads, curtains etc.

____made or upholstered furniture or rugs

____studied flower arranging

____cooked a meal for family or friends

2. In the last two years have you from your own choice

____designed clothing, cushions, bedspreads, etc

____designed furniture or rugs

____created and prepared a recipe for family or friends

____made a flower arrangement other than for your own home

____made up a game to entertain young children

3. Have you ever earned money from any of the designs or creation described in question 2, (including from making or selling things you have designed)?
YES____ NO____ If yes, please describe very briefly.

4. Have you ever won a prize or award for any of the designs or creations in question 2 or from things made from your designs?
YES____ NO____ If yes, please describe briefly.

5. Have you ever had an article in a newspaper, magazine or book about any of the designs or creations listed in question 2?
YES____ NO____ If yes, please describe briefly.

Name: _____

Sex (circle) M F

Grade Level: _____

Directions

Following are thirty statements concerning how you feel about different things and people. You will recognize that the statements are of such a nature that there are no correct (right) or no incorrect (wrong) answers. This is not a test or exam. We are only interested in your honest opinion. Please indicate how "you really feel inside" by placing the number which shows how you FEEL on the line provided in the right hand margin. Your cooperation is appreciated greatly. Your response will remain CONFIDENTIAL.

YOUR INTEREST IN SCIENCE

(Please check only one)

_____ I am really interested in science

_____ I do not know whether I am interested in science

_____ I am not interested in science

YOUR FEELINGS

5 Strongly Agree 

4 Agree 

3 Uncertain 

2 Disagree 

1 Strongly Disagree 

1. Science magazines and stories are interesting. 1. _____

2. I like to watch television programs about science. 2. _____

3. I enjoy collecting leaves or other things from the outdoors. 3. _____

4. I like to watch magic shows. 4. _____

5. It is boring to read about different kinds of animals. 5. _____

6. I don't want to know how rainbows are formed. 6. _____

7. I would like to listen to scientists talk about their jobs. 7. _____

8. I want to know what causes wind. 8. _____

9. I would like to experiment with the gadgets inside the space shuttle. 9. _____

10. It is boring to visit with scientists in their labs. 10. _____

11. It is fun to see inside of toys to learn how they work. 11. _____

12. I like to talk about the planets and stars. 12. _____

13. Movies and pictures about volcanos are interesting. 13. _____

14. I like to watch the sky and the stars at night. 14. _____

15. I dislike to look at small objects through a magnifying glass. 15. _____

16. It is fun to take walks and just look at plants and animals. 16. _____

17. I like to grow plants. 17. _____

18. I like to visit zoos to watch how animals act. 18. _____

19. I like to watch the T.V. news reports about the space shuttle. 19. _____

20. I would like to visit a museum to see dinosaur bones. 20. _____

21. It is boring to hear other people tell about things astronauts have seen or done. 21. _____

22. I like to ask questions about how animals live. 22. _____

23. I like to measure things to see how big they are. 23. _____

24. I like to search for answers to questions about space travel. 24. _____

25. It is boring to learn new science words. 25. _____

26. I wonder what causes colorful sunsets. 26. _____

27. I like to watch clouds move across the sky. 27. _____

28. I don't like to do experiemnts with butterflies. 28. _____

29. It is boring to ask questions about how animals live. 29. _____

30. I like to touch different things to learn more about them. 30. _____

SCHOOL SENTIMENT INDEX

Intermediate Level

Directions: On your answer sheet please show whether each of these sentences is true or untrue for you by marking "true" if the sentence is true or "untrue" if it is not true.

For example:

	True	Untrue	
1.			1. My class is too easy
2.			2. I'd like to stay at my school always.

There are no right or wrong answers, so respond to each item as honestly as you can. Do not write your name on your answer sheet.

		True	Untrue
1.	Other children bother me when I'm trying to do my school work.	☐	☐
2.	My teacher always tells me when she is pleased with my work.	☐	☐
3.	My teacher is interested in the things I do outside of school.	☐	☐
4.	Each morning I look forward to coming to school.	☐	☐
5.	This school is like a jail.	☐	☐
6.	In our class, we often get a chance to make decisions together.	☐	☐
7.	I often feel rushed and nervous in school.	☐	☐
8.	My teacher gives me work that is too hard.	☐	☐
9.	Other children often get me into trouble at school.	☐	☐
10.	My teacher seldom tells me whether my work is good or bad.	☐	☐
11.	My teacher listens to what I have to say.	☐	☐
12.	It is hard for me to stay happy at school.	☐	☐
13.	I follow the rules at school.	☐	☐
14.	There are many different activities at school from which I can choose what I would like to do.	☐	☐
15.	When I do something wrong at school, I know I will get a second chance.	☐	☐
16.	My teacher gives me work that is too easy.	☐	☐
17.	I often must do what my friends want me to do.	☐	☐
18.	My teacher tries to make school interesting to me.	☐	☐
19.	I try to do my best in school.	☐	☐
20.	My teacher does not care about me.	☐	☐

		True	Untrue
21.	School gives me a stomachache.	☐	☐
22.	The principal of my school is friendly toward the children.	☐	☐
23.	I get as many chances as other children to do special jobs in my classroom.	☐	☐
24.	My teacher does not give me enough time to finish my work.	☐	☐
25.	The other children in my class are not friendly toward me.	☐	☐
26.	In school I have to remember too many facts.	☐	☐
27.	I like to do school work at home in the evenings.	☐	☐
28.	My teacher doesn't understand me.	☐	☐
29.	I often get headaches at school.	☐	☐
30.	The principal's main job is to punish children.	☐	☐
31.	My teacher treats me fairly.	☐	☐
32.	My teacher makes sure I always understand what she wants me to do.	☐	☐
33.	I really like working with the other children in my class.	☐	☐
34.	I would rather learn a new game than play one I already know.	☐	☐
35.	I'm afraid to tell my teacher when I don't understand something.	☐	☐
36.	I feel good when I'm at school.	☐	☐
37.	I get scared when I have to go to the office at school.	☐	☐
38.	My teacher unfairly punishes the whole class.	☐	☐
39.	I get tired of hearing my teacher talk all the time.	☐	☐
40.	School is a good place for making friends.	☐	☐

		True	Untrue
41.	I wish my class could have this teacher next year.	☐	☐
42.	I like trying to work difficult puzzles.	☐	☐
43.	My teacher scares me.	☐	☐
44.	I like to stay home from school.	☐	☐
45.	When I have a problem on the playground at recess, I know I can find a nice teacher to help me.	☐	☐
46.	I don't like most of the children in my class.	☐	☐
47.	My teacher is not very friendly with the children.	☐	☐
48.	The biggest reason I come to school is to learn.	☐	☐
49.	My teacher is mean.	☐	☐
50.	I am embarrassed to be in the class I'm in.	☐	☐
51.	My teacher grades me fairly.	☐	☐
52.	I think a new child could make friends easily in my class.	☐	☐
53.	I feel like my teacher doesn't like me when I do something wrong.	☐	☐
54.	There are too many children in my class.	☐	☐
55.	When a new child comes into our class, my friends and I try very hard to make him or her feel happy.	☐	☐
56.	My teacher likes some children better than others.	☐	☐
57.	I feel unhappy if I don't learn something new in school each day.	☐	☐
58.	When I do something wrong, my teacher corrects me without hurting my feelings.	☐	☐
59.	I like school better than my friends do.	☐	☐
60.	I have to share books with other children too often at school.	☐	☐

		True	Untrue
61.	I know what my teacher expects of me.	☐	☐
62.	My teacher is often too busy to help me when I need help.	☐	☐
63.	I want to be a very good student.	☐	☐
64.	My teacher does not scare the children.	☐	☐
65.	I often feel lost at school.	☐	☐
66.	My teacher usually explains things too slowly.	☐	☐
67.	There's no privacy at school.	☐	☐
68.	Older children often boss my friends and me around at school.	☐	☐
69.	At school other people really care about me.	☐	☐
70.	I would rather get books for my birthday than toys or clothes.	☐	☐
71.	I would rather eat lunch at home than at school.	☐	☐
72.	My teacher bosses the children around.	☐	☐
73.	The children in my class nearly always obey the teacher.	☐	☐
74.	We change from one subject to another too often in my class.	☐	☐
75.	I like my teacher.	☐	☐

CHILD INFORMATION

In relationship to the typical child in your neighborhood, please circle a number for each item which best describes your child:
5 - has this trait to a high degree
4 - has this trait more than the typical child
3 - compares with the typical child
2 - has this trait less than the typical child
1 - lacks this trait

1. The child tends to direct the activities of playmates his/her own age.....5 4 3 2 1

2. The child shows great curiosity about his/her surroundings.....5 4 3 2 1

3. The child puts unrelated ideas together in new and different ways.....5 4 3 2 1

4. The child seeks his/her own answers and solutions to problems.....5 4 3 2 1

5. The child likes "grown-up" things and to be with older people..... 5 4 3 2 1

Please comment on the following:

1. Child's special talent or skills

2. Child's attitude towards school

Appendix C

Further Explanation of Certain Items in the 1993-94 Questionnaire Packet

(1) Item-by-item justification for the 41 experiences utilized in Section 2 as potential moderators of "successful" career decision-making--each experience being recommended by at least one gifted specialist.

(2) Expert validation of the one-item scale utilized in Section 6 to measure multipotentiality:

(a) letter sent--to seek validation of the multipotentiality definition--to eight giftedness specialists who have written extensively about multipotentiality (N. Colangelo, J. Delisle, R. Fredrickson, B. Kerr, R. Milgram, P. Perrone, L. Silverman, & D. Willings)

(b) written responses from six of those specialists ("experts")

- -- one expert (B. Kerr) did not respond and one (L. Silverman) responded with a verbal affirmation
- -- the responses were generally descriptive rather than providing a simple response to the question of validity (most of the elaboration referring to comments made by this investigator regarding her conceptualization of multipotentiality)
- -- the responses do, however, appear to be generally supportive of the definition
- -- minor changes were made to the definition, based on the experts' feedback, before including the item in the questionnaire

(1) Item-by-item justification for the 41 experiences utilized in Section 2

recommended experience	*specialists recommending the experience*
1. career guidance in elernentary school	Colson,1980; Kerr, 1991; Silverman, 1993
2. career guidance in high school	Colson,1980; Kerr, 1991; Silverman, 1993
3. career guidance in post-secondary inst.	Colson,1980; Kerr, 1991; Silverman, 1993
4. career guidance outside of school	Colson,1980; Kerr, 1991; Silverman, 1993
5. career planning workshop	Kerr, 1991; Silverman, 1993
6. talk with career counsellor	Kerr, 1991; Silverman, 1993
7. interest inventory	Kerr, 1991; Fredrickson, 1979
8. explore preferred values & lifestyle	Perrone & Van Den Heuvel, 1981
9. visualize self in job in future	Pask-McCartney & Salomone, 1988
10. reassurance career deciding is difficult	Delisle, 1982; Silverman, 1993
11. formal discussions about careers w/ peers	Perrone & Male, 1981
12. variety of different school courses	Kerr, 1991; Silverman, 1993
13. course experience in a field of interest	Kerr, 1991; Milgram, 1991
14. keep options (ie. school) open	Silverman, 1993
15. visit college campuses & classes	Kerr, 1991
16. guest speakers discuss self & career	Kerr, 1991
17. read biographies of famous people	Kerr, 1991
18. interview someone in field of interest	Herr & Watanabe, 1979
19. shadow someone doing a job of interest	Herr & Watanabr, 1979; Kerr, 1991
20. have a mentor	Edlind & Haensly, 1985; Marshall, 1981
21. school internships in fields of interest	Emmett & Minor, 1993; Kerr, 1991
22. volunteer work in a field of interest	Herr & Watanabe, 1979; Kerr, 1991
23. variety of work experience	Herr & Watanabe, 1979; Kerr, 1991
24. work experience in a field of interest	Herr & Watanabe, 1979; Kerr, 1991
25. combine interests to do/create a career	Roper & Berry, 1986; Sanborn, 1974
26. explore career fantasies as a child	Kerr, 1991
27. exposure to a variety of leisure activities	Milgram, 1991
28. participate in a variety of leisure activities	Milgram, 1991

recommended experience	*specialists recommending the experience*
29. discuss parents' jobs with them	Herr & Watanabe, 1979; Kerr, 1991
30. discuss others' jobs with them	Herr & Watanabe, 1979; Kerr, 1991
31. tour job sites of parents & others	Herr & Watanabe, 1979; Kerr, 1991
32. set goals & follow through (ie. projects)	Sanborn, 1974
33. discussions of work & values	Davis & Rimm, 1989
34. view career deciding as ongoing	Fredrickson, 1979; Silverman, 1993
35. realize career deciding can be frustrating	Delisle, 1982; Silverman, 1993
36. prioritize interests & abilities	Kerr 1981b; Roper & Berry, 1986
37. actively make career choices & decisions	Holland, 1985; Sanborn, 1974
38. think about careers & weigh pros & cons	Davis & Rimm, 1989
39. informal career discussions w/ family	Kerr, 1991; Milgram, 1991
40. informal career discussions w/ peers	Perrone & Male, 1981
41. informal career discussions w/ teachers	Kerr, 1991; Milgram, 1991

(2a) Letter Sent to Seek Validation of the Multipotentiality Definition

McGill

Department of Educational Psychology and Counselling

Faculty of Education
McGill University

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H3A 1Y2

Tel.: (514) 398-4240
Fax: (514) 398-6968
Telex: 05 268510

I am in the middle of my M.A. thesis and am in need of advice. My topic is multipotentiality, and I am trying to discover how best to measure it and what factors can help ensure multipotentiality works to one's advantage, rather than leading to long-term career indecision. Bruce Shore is my advisor, and he has put me in touch with you.

From an extensive literature review, I have come to see multipotentiality as a syndrome based on the burning desire to learn and do "everything". Thus I see it as consisting of interest, ability, and "overchoice".

I have tried to put together a descriptive definition of multipotentiality and would like your opinion about this definition. I plan to ask my subjects (250-20 year old gifted individuals who are part of a longitudinal study) to rate, on a scale from 1-5, how much this description fits them, and in what way it does so.

Having written about ____ this area, what do you think of my definition? Do you think my 1-item scale is a valid measure of multipotentiality? Could you suggest any improvements or offer any advice?

Thank you very much, in advance, for your time and expertise. If you could, would you please respond as soon as possible, as my research team is waiting and ready to collect data.

MULTIPOTENTIALITY

Multipotentiality is the desire to do and the ability to succeed in many different activities.

It is especially evident in leisure and career decision-making.

One may benefit from the effects of multipotentiality and lead a varied and full life.

One may also suffer from the "overchoice" and find decision-making very difficult, as it is not possible to do all that one would like to do and is capable of doing.

Thank you,
Kathy Rystew
c/o Bruce Shore

(2bi) Written Response from N. Colangelo

The Connie Belin National Center for Gifted Education

College Of Education
210 Lindquist Center
Iowa City, IA 52242-1529
(319) 335-6148
FAX: (319) 335-5151

FACSIMILE TRANSMITTAL FORM

Date: 10-18-93

MULTIPOTENTIALITY

Multipotentiality is the desire to do and the ability to succeed in many different activities.

It is especially evident in leisure and career decision-making.

One may benefit from the effects of multipotentiality and lead a varied and full life,

One may also suffer from the "overchoice" and find decision-making very difficult, as it is not possible to do all that one would like to do and is capable of doing.

and have a number of highly attractive choices.

OK - one would have to forgo several highly desirable choices.

Bruce Definition is quite good and reflects what is meant by multipotential. I made some minor editing— Nick

(2bii) Written Response from J. Delisle

Kent State University
College of Education
Kent, Ohio 44242-0001

FAX No. (216) 672-3407

From: Jim Delisle
Re: Multipotentiality

I've had a chance to review your interpretations of multipotentiality and you seem pretty much on target. Here are my suggestions for further consideration:

* I'm not sure multipotential is always a "burning desire". In some, it is; in others, it's merely an "adjunct" to being gifted in several areas simultaneously.
* Your reference to multipotential affecting leisure activities (not just careers) is a new slant on the term for me. Still, it is a valuable path to study; your own research may come up with the research to back up this new slant.
* The specific questions you ask your study's subjects may need to be very specific re: vocational and leisure interests. I might let the term "multipotential" emerge from them rather than use it with your Ss.

As you know, Sanborn + Marshall's research on multipotential is the earliest (and the best). Also look into some of Nick Colangelo's work if you haven't already.

(2biii) Written Response from R. Fredrickson

December 2, 1993

Ms. Kathy Rysiew
%Dr. Bruce Shore
Department of Educational Psychology and Counseling
Faculty of Education
McGill University
3700 McTavish Street
Montreal, Quebec, Canada
H3A1Y2
FAX: 514-398-6968

Dear Ms. Rysiew:

I was pleased to hear of your interest in the concept of multipotentiality. I was further encouraged by your plan to do research with 250 gifted individuals. I will try to respond to your questions and make some suggestions which I think will strengthen your scale and help you obtain more valid information.

The definition I have used since I first published it in 1972 in RECOGNIZING AND ASSISTING MULTIPOTENTIAL YOUTH is-
"A multipotential person is defined in this volume as any individual who, when provided with an appropriate environment, can select and develop any number of competencies to a high level. He or she is a person who seemingly is able to adapt his or her performances and is therefore, well suited for a world in which there is much change. For those who can adapt and still exhibit high levels of performance, there is a premium on their contributions to mankind and their own personal satisfactions."

This is a rather elaborate definition and is similar to yours with the exception of the "overchoice" issue which interjects a frequent dilemma faced by multipotential individuals. Without appropriate career counseling, many multipotential individuals are overwhelmed by these choices and become fearful of making a commitment to a particular occupation or occupational field. This indecision is a state not a trait and can be helped. I have found clinically that such "overchoice" can lead to depression, lack of confidence and low self-esteem since everyone expects them to do well.

The concept of multipotentiality is certainly applicable for most gifted individuals but I find it also helpful in working with many who are simply above average and highly motivated and organized. There are gifted individuals who are not multipotential but have learned to focus early in their life and have thus excelled. Olympic athletes, musicians are examples. In Chapter 3 of my book CAREER INFORMATION I describe one way of assisting multipotential individuals in career planning.

As to your scale, I have found self-efficacy ratings more valid in measuring multipotentiality. Your subjects might respond to such

questions as "If my first occupational choice does not work out, I am confident I can change quickly." Consider an even-number scale to help spread the distribution. In addition to ability and interest, include items on financial resources and social supports, mentors, friends and family. Be careful not to lead your subjects into focusing on "overchoice". Try to measure these things indirectly. You don't want to convince them they should be overwhelmed. There is nothing wrong in asking them directly as long as the opposite is also asked. Perhaps divide your scale into two parts ask them to scale how a particular statement fits them and also include a section on how confident they are they will succeed or attain a certain goal or condition. You should check the research literature on self-efficacy rating scales. Take care in developing your scale . It is a crucial step.

I have responded quickly to your letter since I will be on a consulting trip the next two days. I sincerely hope this information will be helpful to you and Dr. Shore. I would enjoy reading the results of your study when completed.

Sincerely yours,

Ronald H. Fredrickson
Professor Emeritus
School of Education
University of Massachusetts-Amherst, MA 01003
Mailing address:
Route No. 4, Box 211
Osage City, KS 66523

(2biv) Written Response from R. Milgram

To: Kathy Rysiew, c/o Bruce Shore

Dear Kathy,

I am very interested in the phenomenon of multipotentiality and was very happy to hear of your project. I am also actively working on the topic now as part of a longitudinal follow-up study of people in their early 30's. Fortunately, I have their baseline data from age 18.

I think that the intelligent inquiries that you are raising at this early stage will prevent the disaster of finding yourself with data that is near impossible to score and summarize at a later stage. On this I congratulate you - and your advisor, of course.

I hope that I am will not raise more problems that I help solve in my response below but I am using the opportunity to share with you some thoughts that I have had as I work along on the question.

Let me start with comments on the definition. It seems to me that multipotentiality is a matter of interest, ability, and opportunity. What you call "desire to do" is I think a reference to the motivational aspect and it is essential realization. Fulfillment of one or more of one's potential life choices including career-choice is to a large degree determined by personal-social variables (persistence, motivation, and the like).

Achievement (without discussing the complex question of how one defines achievement in the various life areas) is a matter of interest, ability, motivation (what you call desire to do) and opportunity (very important).

I think that you would be wise to limit yourself to the matter of multipotentiality defined operationally as many interests. The other aspects (ability, motivation, opportunity) must also be investigated but programmatic research must proceed step by step.

The phenomenon of multipotentiality has been assumed to exist but the empirical validity of the concept remains to be demonstrated. In the literature of counseling the gifted no one questions the very existence of the phenomenon and if indeed it exists, in what percentage of people. To the best of my knowledge, no empirical study has been done investigating and, we hope, demonstrating the empirical distinction we postulate. I think that demonstrating multipotential career interest would alone would be a major contribution.

I think that it will be difficult to demonstrate the validity of a one item scale. Although it is easy to administer, you will have many headaches in scoring. I used a Life Aspiration Questionnaire and a Peak Experiences Measure (Ted Landesman's work) as a baseline measure in a longitudinal study. This is just a few questions and it took us months to prepare the scorers so that the percent of agreement would be acceptable.

I think that the sentence in the definition on leisure activities and career decision making is premature because multipotentiality in these areas has only been discussed in the literature and postulated as part of a theory (by me) but has not yet been empirically demonstrated. I am working on it - but there is always room for many research projects in an area and I am happy to see this effort.

I suggest that as a first step in this line of investigation you operationally define multipotentiality in terms of multiple career interest, administer the Holland (or Roe) Inventory to your Ss and see if they are indeed multipotential. You might also use the same approach and define career interest in terms of focus of leisure activities. You could use as an operational definition an activities inventory - mine or another. Both of these instruments are easy to administer and can be machine scored.

The same comments about the benefits and problems that accrue to the multipotential individual - this is a question and has not yet been empirically established. You would have to measure the life satisfactions and problems of the Ss and see if multipotential Ss have more or less. A major study on in its own right.

Finally, I wonder about the age of your Ss. Are people still multipotential at age 20? Shouldn't they be on their way to career by this time? Will you ask them for retrospective reports of how they felt in high school and early university years? Problem?

Finally, I assume that your Ss are all high IQ gifted - identified on basis of IQ. Since IQ is a measure of general ability, we might expect these Ss to be multipotential. Had gifted been defined in terms of specific domains or even school grades in specific subjects and not overall GPA you might find gifted not so multipotential. In other words, maybe IQ gifted guarantees the phenomenon. Maybe that is why it is so frequently reported in the literature - a result of narrowness of definition of IQ.

If you are interested in exploring the possibility of using the Tel Aviv Activities Inventory (TAAI), I might mention two new papers that have recently appeared in the literature that will help you get a picture of the possibilities. One is in the Gifted Child Quarterly, 1993, 37, p 65 (Hong, Whiston, and Milgram) and the other is in the Journal of Career Development, 1993, 19, p. 221 (Hong, Milgram, and Whiston). These were studies done with younger colleagues at University of Nevada, Las Vegas when I was on sabbatical there. One problem I might mention ahead of time is that although these papers are obviously in English the TAAI is in Hebrew. The data upon which these studies were based was collected in Israel.

I wish you all the best in the days ahead. You have chosen an interesting area. I look forward to seeing the results of your effort. If I can be of further help, please, write again.

All the best,

Roberta Milgram

(2bv) Written Response from P. Perrone

October 18, 1993

Dear Kathy:

I'd like to comment on your rational before looking at your definition.

You may want to differentiate between highly motivated/stimulated multi-potentials who "have a burning desire" and those who lack such a desire but could still be considered multi-potential.

Secondly, I'm not sure multi-potentiated have a desire to learn or do "everything" but rather they are attracted to and capable of several "diverse" learning activities.

While multiple interests, capabilities, and motivations may "force" one to choose from among many options, the options may not be equally interesting nor the individual equally capable or motivated.

Definition: Suggested

Multipotentiality is the ability, and possibly the desire, to pursue socially differentiated goals and activities. Due to limited time, energy, and resources frequently it is not possible to pursue these goals and activities to the desired extent - thus leading to difficult choices. Specific examples are evident in deciding among what appear to be equally attractive leisure activities and careers.

A potential benefit of multi-potentiality is the possibility of leading a varied life which includes creating ways to integrate goals which others see as discrete.

One may suffer from "overchoice", not being able to satisfactorily pursue all the opportunities which seem to exist and not having any meaningful criteria for deciding among the various opportunities.

Kathy I'm suggesting that (a) the multi-potentiated individual may be able to create ways to integrate (combine) what others see is differentiated or diverse. Also, being multi-capable does not equate with being equally interested or motivated. However, being equally interested and motivated does compute regarding choice anxiety.

Don't confuse your definition of multipotentiality (where desire and interest may not be high in any or all areas) with choice anxiety associated with multipotentiality (where desire and interest would be equally high in all areas).

(2bvi) Written Response from D. Willings

The Willings Learning Clinic

116 Gaywood Road
King's Lynn
Norfolk PE30 2PX
England
Telephone: (0553) 76273

23rd October 1993

Dear Kathy,

Someone getting into the woefully neglected area of multi-talentedness moves me to first name terms. This Clinic offers one-to-one help to gifted underachievers. Multi-talentedness is certainly a cause of underachievement. We have very exhaustive data on 44 underachievers who have come to this Clinic. The age range is 7-19. There are 22 boys and 22 girls. 23 (52.2%) of our sample are multi talented. If material on such a small sample is of interest I shall be very happy to send you some. I always think the lot of the multi-talented is admirably summed up by the French poet Jacques Prévert

Le soleil ne brille pas pour ceux qui en ont trop à dire pour le pouvoir dire.

Before I comment on some points I feel it only fair to tell you that, when I was a Professor and Student Counsellor at the University of New Brunswick, the boys in a Residence referred to me as "precise phraseology Willings". Having shared that with you I wonder how you feel about multi-talentedness rather than multi-potentiality. I know Colangelo and Zaffran use the latter word but I am bemused by what they mean by it. When I was an infant I may have had all manner of potentiality but does that mean I had talent, or the potential to develop a talent ? To what extent was I a tabula rasa when I was born? No two psychologist would agree on this. Talent is much more specific than potentiality. I do not appear to have musical talent but I have scored high on a musical comprehension test. Then we get into another problem. I have no motivation to develop musical talent. As a field hockey coach I seem to have talent. Three kids I have coached (field hockey is a men's and women's game over here) now play for England. What I do have is a motive to see kids develop. This has come out in coaching field hockey. My motive seems to affect my approach to coaching. The kids in the team all call me 'Daddy'. You will readily see that when we get into the potentiality/motivation relationship we have opened up a right can of worms. It doesn't end there. We get into the opportunity/experience swamp. Field hockey was very much in vogue at my High School (a private boarding school). I may well have had musical potentiality but I had a totally piano teacher and, when I was nine, I flatly refused to have any more music lessons. You see where I have led us both ? If we stay with potentiality we have to get into latent and manifest potentiality. How on earth are we to identify latent potentiality? If you want to try you should be awarded the V C for exceptional bravery and court martialled for unecessarily exposing yourself to risk !

We can put the lid back on that can of worms by using the managable concept of talentedness.

On your definition, would you consider the word need rather than desire ? Personally I believe compulsion to be the right word but you may have trouble defending the use of that word to your committee. Maslow has made the word need respectable !

I am enclosing an article I put out in 1983. Since that time I have had the very great privilege of working with Dr Nicholas Chamberlain. Dr Chamberlain is a medical doctor who teaches Family Medicine to post M D students for the Royal Society of Medicine. He has a special interest in gifted children and contends that Family Doctors must be made aware that the gifted child is an at risk child. Working with him has vastly expanded my horizons.

I now see that there is another dimension to the Vocational Skills (described in the article as mental requirements). This we call the motivating skill. My high skills are People Orientation, Diagnostic and Verbal. I was not happy as a Professor. My rewards came on the two afternoons and evenings a week when I was student counselling. My motivating skill is People Orientation.

Nick and I have also seen that our career is part, not even the pivot, of our lifestyle. Career Guidance is a misnomer. We need to help gifted children to evolve a satisfactory lifestyle. Our life style hinges on three equally important aspects

career strategies
strategies for creative growth
strategies for fitness

I enclose my Lifestyle Map and that of an 18 year old pre-medical student. We tell people at the Clinic that they must update their Willings Chamberlain Lifestyle Map every two years. This does seem to help multi-talented students.

Some of their frustration with choices seems to us to reflect a "pull it all together now" mentality. The trouble with Manpower Planning is that it is is in the hands of 15 year olds. But do they have to pull it altogether now. We believe we have helped some of our younger friends by showing them that they do not have to pull together their strategies for creative growth now. They can think of

immediate creative goals
medium term creative goals
long term creative goals.

Then it does become feasable to do many of the things they have a need (compulsion) to do.

The word in round brackets on the map is the skill they use in that particular strategy. The word in square brackets is the self they are talking to in that strategy. You say you are in the middle of your thesis so I imagine you have not the time to get into this. By way of explanation Nick and I contend that we all of us have several selves. As we go through life we tend to stop talking to more and more of our selves. My friend

talking to any of their selves by the time they take their degree. Germaine sees not talking to any of our selves as strategic to burnout. When Germaine was in England last May we had several days of penetrative dialogue. Germaine has shown me that, as a University Professor, I was not talking to any of the David's. Never, never, never try to identify your own selves. Germaine identified six David's and Nick Chamberlain entirely concurs. These are

rescuer David
scientific David
religious David
poetic David
executive David
crusader David.

The religious self does not necessarily imply being active in a Church. It is the self which needs to get in touch with the forces beyond space and time. Being active in a Church can prevent us from talking to the religious self because it sets limits on the forces. That is why I insist that, in my study of the duende, I am talking to Religious David.

Alice Heim (Intelligence and personality Harmondsworth: Pelican Books 1970) points out that we ignore creative motivation at our peril. At this Clinic we look for creative motivation consistently translated into action. Would this be helpful to you in identifying the multi-talented ?

7 of our multi-talented younger friends were described to us by a teacher as lacking task commitment (Renzulli). We have found what your definition implies. In this age of one shot men and women they have too much task commitment. We call what is required of them psychic amputation. They have to amputate various rewarding aspects of their lives.

You say you are in the middle of your thesis. Have you already designed your research tool ? If not may I offer a suggestion ? Would it help you to ask your respondents to rate the propositions from your definition on a 5 point scale

1 - absolutely true of me
2 - true of me
3 - sometimes true of me
4 - not exactly true of me
5 - not true of me at all ?

Your research is most important. If there is any way I can be of help do let me know. Since you are under pressure of time you are very welcome to call me if you can afford it. Please do remember that we are five hours ahead of you. Here it is 8-00 pm right now. This means it is 3-00 p m with you.

You could not wish for a better supervisor than Dr Shore. He combines disciplined scholarship with a breadth of view.

Sincerely

David.

Appendix D
Coding Form

row	*col*	*variable*	*type of data*	*data obtained*	*possible responses*	*origin of data*
1	1		IDENTITY INFORMATION	row number	1	
1	2-4			file number	1-180	
1	5-7			subject number	1-223, 501-574	assigned in '84
1	10	1	CONTROL DEMOGRAPHICS	summer school	1(McGill),2(Laval)	'84 coded data
1	11	2		sex	1(male), 2(female)	Questionnaire Section 1
1	12-13	3		age (as of Jan. 1/94)	16-25	Questionnaire Section1
1	14-15	4		ethnicity	0-12*	Questionnaire Section 1
1	16-17	5		SES	14-75*	Questionnaire Section 1
1	18	6		educ. level	1-7*	Questionnaire Section 1
1	19-20	7		Creativity	0 & up	'84 coded data
1	23-25	8	ABILITY	Verbal IQ	0 & up	'84 coded data
1	26-27	9		Nonverbal IQ	0 & up	'84 coded data
1	28	10		variety ability	1(not at all)-4(very much true)	Questionnaire Section 4
1	31	11	OPPORTUNITY	Barriers	0-4	MVS - pg. 2
1	32	12		variety opportunity	1(not at all)-4(very much true)	Questionnaire Section 4
1	35	13	MOTIVATION &	attitude to school	1(neg), 2(neut), 3(pos)	'84 Parental Questionnaire
1	36	14		seeks own answers	1(lacks trait)-5(high degree)	'84 Parental Questionnaire

row	*col*	*variable*	*type of data*	*data obtained*	*possible responses*	*origin of data*
1	37	15	↓ MOTIVATION	curiosity	1(lacks trait)-5(high degree)	'84 Parental Questionnaire
1	38-40	16		Science Curiosity	30-150	Children's Science Curiosity Scale
1	41-42	17		School Sentiment	0-75	School Sentiment Index
1	43	18		Learning subscale	0-7	subscale of SSI
1	44-45	19		leisure activities if time	0 & up	Questionnaire Section 5
1	48-49	20	LEISURE INTERESTS	leisure activities last year	0 & up	Questionnaire Section 5
1	50-51	21		leisure activities ever	0 & up	Questionnaire Section 5
1	52-53	22		Creative Activities Checklist	0-54	'84 coded data
1	54	23		variety interest	1(not at all)-4(very much true)	Questionnaire Section 4
1	57-62	24-29	LEISURE + CAREER INTERESTS 1984	Holland '84 types (ranked)	1(R), 2(I), 3(A), 4(S), 5(E), 6(C)*	'84 Strong Interest Inventory
1	63-64	30		% occup. likes	0-100	'84 SII
1	65	31		# OS > 40	0-6*	'84 SII
1	66	32		# high GOT	0-6*	'84 SII
1	67-68	33		# high BIS	0-23*	'84 SII
1	69-70	34		H differentiation	0-100*	'84 SII
1	71-72	35		I differentiation	0-50*	'84 SII
1	73	36		consistency	1(low), 2(mod), 3(high)*	'84 SII
2	1		IDENTITY INFORMATION	row number	2	
2	2-4			file number	1-180	
2	7-12	37-42	↓	Holland '94 types (ranked)	1(R), 2(I), 3(A), 4(S), 5(E), 6(C)*	'94 Strong Interest Inventory

row	*col*	*variable*	*type of data*	*data obtained*	*possible responses*	*origin of data*
2	13-14	43	↓	% occup. likes	0-100	'94 SII
2	15	44		# OS > 40	0-6*	'94 SII
2	16	45	CAREER INTERESTS '94/'94	# high GOT	0-6*	'94 SII
2	17-18	46		# high BIS	0-23*	'94 SII
2	19-20	47		H differentiation	0-100*	'94 SII
2	21-22	48		I differentiation	0-50*	'94 SII
2	23	49		consistency	1(low), 2(mod), 3(high)*	'94 SII
2	26	50		# goals - elem	0 & up	Interview-Q#2a
2	27	51		# goals - hs	0 & up	Interview-Q#2b
2	28	52		# goals - post hs	0 & up	Interview-Q#2c
2	29	53	CAREER INTERESTS	# goals - now	0 & up	add Int-Q#5a&b (delete repeats)
2	30	54		# goals - MVS	0 & up	MVS
2	31-32	55		# goals - ever	0 & up	add var. 50-54 (delete repeats)
2	33	56		1+ choice ?	0(no), 1(yes)	Interview-Q#4a
2	34	57		H type of goals	1(R), 2(I), 3(A), 4(S), 5(E), 6(C)*	Interview-Q#5a
2	36	58		multipotentialed now	1(not at all)-4(very much true)	Questionnaire Section 6
2	37	59		elaboration mentions	0(neither), 1(abil), 2(int), 3(abil & int)	Questionnaire Section 6
2	38	60	MULTIPOTENTIALITY ↓	elaboration affect	1(neg), 2(neut), 3(pos)	Questionnaire Section 6
2	39	61		multipotentialed then	1(not at all)-4(very much true)	Questionnaire Section 6
2	40	62		elaboration mentions	0(neither), 1(abil), 2(int), 3(abil & int)	Questionnaire Section 6

row	*col*	*variable*	*type of data*	*data obtained*	*possible responses*	*origin of data*
2	41	63	↓	elaboration affect	1(neg), 2(neut), 3(pos)	Questionnaire Section 6
2	42-43	64		total 3 varieties	3-12	add var. 10,12,23
2	46-47	65		Vocational Identity	0-18	MVS - pg. 1
2	48	66		Q #2 from VI	0(true), 1(false)	MVS - pg. 1
2	49	67		Q #14 from VI	0(true), 1(false)	MVS - pg. 1
2	50	68		type of problem	0(none), 1(other), 2(multichoice)	Interview-Q#6a
2	51	69		effect of 1+ choice	1(neg), 2(neut), 3(pos)	Interview-Q#4b
2	52	70		difficulty of deciding	1(very difficult)-5(very easy)	Interview-Q#1b
2	53	71		feel deciding	1(really bad)-5(really good)	Interview-Q#1c
2	54	72		confident will be happy with career	1(never satisfied)-5(will be satisfied)	Interview-Q#5c
2	56-57	73		total career satisfaction	0-17*	Questionnaire Section 3
2	58-59	74		total self satisfaction	0-17*	Questionnaire Section 3
2	60-61	75		total life satisfaction	0-17*	Questionnaire Section 3
2	62-63	76		grand total satisfaction	0-51	add var. 74-76
2	66-80	77-91	↓	15 possible experiences	0(none)-3(lots)	Questionnaire Section 2
3	1			row number	3	
3	2-4			file number	1-180	
3	7-32	92-117	↓	26 possible experiences	0(none)-3(lots)	Questionnaire Section 2
3	34-35	118		total experiences	0-123	add var. 77-117

row	*col*	*variable*	*type of data*	*data obtained*	*possible responses*	*origin of data*
3	37-77	119-159	↓	41 possible benefits	0(none)-3(lots)	Questionnaire Section 2
3	79-80	160		total benefits	0-123	add var. 119-159
4	1			row number	4	
4	2-4			file number	1-180	
4	7-9	161		% school likes	0-100	'84 SII
4	10-11	162		% leisure likes	0-100	'84 SII
4	12-13	163		academic comfort	0-100	'84 SII
4	14-15	164		intro-extraversion	0-100	'84 SII
4	16-27	165-170		standard scores GOT '84	0-100	'84 SII
4	28-73	171-193		standard scores BIS '84	0-100	'84 SII
5	1			row number	5	
5	2-4			file number	1-180	
5	5-6	194		congruence '84-'94	0-28*	'84 & '94 SIIs
5	7-9	195		% school likes	0-100	'94 SII
5	10-11	196		% leisure likes	0-100	'94 SII
5	12-13	197		academic comfort	0-100	'94 SII
5	14-15	198		intro-extraversion	0-100	'94 SII
5	16-27	199-204		standard scores GOT '94	0-100	'94 SII
5	28-73	205-227		standard scores BIS '94	0-100	'94 SII

***further explanations:**

***variable 4 - 1(Canadian), 2(Fr. Canadian), 3(Jewish), 4(Greek), 5(black), 6(Brit. Isles), 7(W. Europe), 8(E. Europe), 9(India), 10(Egypt), 11(S.E. Asia), 12(other)**

*variable 5 - used father's occupation if possible with Blishen-McRoberts (1976) scale
- otherwise used mother's occupation with Blishen-Carroll (1978) scale
- "best-guessed" if necessary

*variable 6 - 1(some high school), 2(high school diploma), 3(some CEGEP), 4(CEGEP diploma), 5(some university), 6(university degree), 7(post-bachelor degree)

*variables 24-29 &37-42 - ranked GOT scores from highest to lowest (ties broken randomly)

*variables 31 & 44 - number of Holland categories with OS scores > 40

*variables 32 & 45 - number of GOT scores with comments from "moderately high" to "very high"

*variables 33 & 46 - number of BIS scores with comments from "moderately high" to "very high"

*variables 34 & 47 - [X1-X6] (see Holland, 1985)

*variables 35 & 48 - 1/2[X1-(X2-X4)/2] (see Iachan, 1984a)

*variables 36 & 49 - high consistency when top two GOT scores adjacent on Holland's hexagon
- moderate consistency when tney are one apart
- low consistency when they are opposite (see Holland, 1985)

*variable 57 - assigned Holland type to primary present-day career goals (see Gottfredson & Holland, 1989)
- "best-guessed" if possible, otherwise assigned "0"

*variables 73-75 - combined 3 scores related to each variable from tables in Section 3

*variable 194 - compared '84 & '94 top 3-letter codes for overlap (see Iachan, 1984b)

Appendix E1

Correlation Matrix of Potential Measures of MP

	A58R	A61R	A23	A10	A1023
A58R	1.0000	.2228*	.2088*	.4029**	.3603**
A61R	.2228*	1.0000	.1193	.0021	.0668
A23	.2088*	.1193	1.0000	.3014**	.8511**
A10	.4029**	.0021	.3014**	1.0000	.8810**
A1023	.3603**	.0668	.8511**	.8810**	1.0000
A22	.2551	.2016	.2761*	.1933	.2677*
A20	.2341*	.1137	.1587	.0489	.1164
A19	.1270	.1892	.2241*	.1558	.2169*
A21	.2702**	.0988	.1897	.1918	.2182*
A53	-.0904	-.0882	.1967*	-.0227	.0938
A54	.0872	.1610	.2105*	.0037	.1177
A55	.0341	.1363	.1371	.0082	.0799
A199204	.2285*	.0911	.2631**	.0634	.1825
A45	.1409	.0334	.1794	.0374	.1209
A46	.2059*	.0959	.1735	.0965	.1535
A44	.0151	-.0548	-.1288	.0438	-.0439
A43	.1577	.1541	.2007*	.0873	.1627
A195	.2371*	.0988	.2588**	.1340	.2228
A196	.2799**	.0622	.3123**	.2219*	.3055*
A47	-.0063	.0119	-.0079	.1005	.0567
A48	.1427	.1021	.1825	.0634	.1394
A49	.0378	-.1079	.0686	-.1140	-.0316
A165170	-.1197	-.0083	.2347	.0905	.1774
A32	-.0898	.0205	.1482	.0334	.0969
A33	-.0622	-.0172	.1911	.0811	.1492
A31	-.0475	.0613	-.0091	.0211	.0088
A30	-.0750	.0040	.2013	.0364	.1260
A161	-.0263	.0561	.2622*	.1291	.2160
A162	-.0376	.0613	.1286	.0545	.1004
A34	-.0099	.0803	-.2310	-.0152	-.1277
A35	-.0949	.0477	.1324	.0824	.1200
A36	.0033	-.0792	.2259	.2068	.2468

	A22	A20	A19	A21	A53	A54
A22	1.0000	.3284*	.3228*	.2395	-.2083*	.0556
A20	.3284*	1.0000	.4202**	.6817**	-.0400	.0301
A19	.3228*	.4202**	1.0000	.5490**	.0857	.1460
A21	.2395	.6817**	.5490**	1.0000	-.0571	.1040
A53	-.2083*	-.0400	.0857	-.0571	1.0000	.2663**
A54	.0556	.0301	.1460	.1040	.2663**	1.0000
A55	.1076	.0824	.1458	.1262	.2096**	.7625**
A199204	.2082	.2230*	.2983**	.2679**	.1235	.1335
A45	.0515	.1510	.2311*	.1460	.0846	-.0147
A46	.2332	.1711	.2553**	.1696	.0534	.0740
A44	-.1119	-.0779	.0284	-.0260	.0143	.0928
A43	.1536	.1768	.2999**	.1582	.2035*	.0898
A195	.2319	.1703	.2808**	.2681**	.0404	.1022
A196	.2252	.2072*	.3014**	.3115**	-.0187	.1365
A47	-.0272	-.0751	-.0751	.0674	-.2186*	-.0924
A48	.1664	.2056*	.2355*	.3016**	-.0491	.0074
A49	.1090	.1202	-.0813	.1778	-.0920	-.0492
A165170	.1592	.0810	.2176	.1844	.0235	.0102
A32	.1331	-.0668	.2655*	.1156	-.0113	.0368
A33	.0688	-.0760	.2795*	.1141	-.0111	.0561
A31	.0322	-.0526	.2272	.0786	.1019	.0836
A30	.1606	-.0149	.2814*	.1564	.0203	.1490
A161	.2897*	-.0763	.2398	.0506	.0989	.2285
A162	.2535	.0333	.2212	.1333	.0003	.3220*
A34	.0303	.1194	-.0114	.0733	.0229	.1633
A35	.1557	.0159	.2488	.1874	.0087	.0805
A36	.0645	.0689	.0506	.1506	.0150	.1007

	A55	A199204	A45	A46	A44
A58R	.0341	.2285*	.1409	.2059*	.0151
A61R	.1363	.0911	.0334	.0959	-.0548
A23	.1371	.2631**	1794	.1735	-.1288
A10	.0082	.0634	0374	.0965	.0438
A1023	.0799	.1825	.1209	.1535	-.0439
A22	.1076	.2082	.0515	.2332	-.1119
A20	.0824	.2230*	.1510	.1711	-.0779
A19	.1458	.2983**	.2311*	.2553**	.0284
A21	.1262	.2679**	.1460	.1696	-.0260
A53	.2096**	.1235	.0846	.0934	.0143
A54	.7625**	.1355	-.0147	.0740	.0928
A55	1.0000	.1986*	.1346	.1342	.0522
A199204	.1986*	1.0000	.8092**	.8675**	.3440**
A45	.1346	.8092**	1.0000	.8606**	.4114**
A46	.1342	.8675**	.8606**	1.0000	.4703**
A44	.0522	.3440**	.4114**	.4703**	1.0000
A43	.1660	.7760**	.7661**	.7841**	.3859**
A195	.2050*	.7371**	.6879**	.7092**	.2920**
A196	.1301	.7541**	.6558**	.7076**	.2743**
A47	-.0328	.0221	.1277	.0407	-.0566
A48	.1540	.7898**	.7313**	.7133**	.2773**
A49	-.0050	-.0233	-.0794	-.0690	-.0653
A165170	.0102	.2020	.1892	.2356	.0939
A32	.0256	.1146	.1383	.2089	-.0544
A33	-.0305	.1161	.1280	.1774	-.0845
A31	-.1535	-.0167	-.0621	.0694	-.0400
A30	.0755	.1114	.1144	.2019	-.0535
A161	.0522	.1275	.1569	.2167	.0089
A162	.1076	.1439	.1356	.1673	.0340
A34	.0970	-.2160	-.1837	-.1835	.0651
A35	.0325	.1752	.1431	.2068	-.0790
A36	.0554	.1609	.1428	.1142	-.0059

A43	A195	A196	A47	A48	A49
.1577	.2371*	.2799**	-.0063	.1427	.0378
.1541	.0988	.0622	.0119	.1021	-.1079
.2007*	.2588**	.3123**	-.0079	.1825	.0686
.0873	.1340	.2219*	.1005	.0634	-.1140
.1627	.2228*	.3055**	.0567	.1384	-.0316
.1536	.2319	.2252	-.0272	.1664	.1090
.1768	.1703	.2072*	-.0751	.2056*	.1202
.2999**	.2808**	.3014**	-.0751	.2355*	-.0813
.1582	.2681**	.3115**	.0674	.3016**	.1778
.2035*	.0404	-.0187	-.2186*	-.0491	-.0920
.0898	.1022	.1365	-.0924	.0074	-.0492
.1660	.2050*	.1301	-.0328	.1540	-.0050
.7760**	.7371**	.7541**	.0221	.7898**	-.0233
.7661**	.6879**	.6558**	.1277	.7313**	-.0794
.7841**	.7092**	.7076**	.0407	.7133**	-.0690
.3859**	.2920**	.2743**	-.0566	.2773**	-.0653
1.0000	.6188**	.6152**	-.0035	.5872**	-.1225
.6188**	1.0000	.7141**	.1701	.6175**	.0146
.6152**	.7141**	1.0000	.1177	.6516**	.0060
-.0035	.1701	.1177	1.0000	.4339**	.2818**
.5872**	.6175**	.6516**	.4339**	1.0000	.0558
-.1225	.0146	.0060	.2818**	.0558	1.0000
.1615	.2750*	.2666*	.1833	.1515	.0696
.0187	.2590*	.1741	.1301	.1045	.1901
.0280	.2739*	.2102	.1792	.1019	.1305
-.0584	.2154	.0555	.1200	-.0954	.1261
.0682	.2362	.2113	.1979	.1016	.2004
.1486	.3384**	.2906*	.2448	.1050	.0666
.0628	.3030*	.2934*	.2005	.0824	.0819
-.1692	-.2321	-.2075	.1235	-.1450	-.0770
.1074	.2268	.2423	.1721	.1213	.0343
.1147	.1668	.1953	-.0013	.1166	-.1157

	A165170	A32	A33	A31	A30
A58R	-.1187	-.0898	-.0622	-.0475	-.0750
A61R	-.0083	.0205	-.0172	.0613	.0040
A23	.2347	.1482	.1911	-.0091	.2013
A10	.0905	.0334	.0811	.0211	.0364
A1023	.1774	.0969	.1492	.0088	.1260
A22	.1592	.1331	.0688	.0322	.1606
A20	-.0210	-.0668	-.0760	-.0525	-.0149
A19	.2176	.2655*	.2795*	.2272	.2814*
A21	.1044	.1156	.1141	.0786	.1564
A53	.0255	-.0113	-.0111	.1019	.0203
A54	.0102	.0368	.0561	.0836	.1490
A55	.0102	.0256	-.0305	-.1535	.0755
A199204	.2020	.1146	.1161	-.0167	.1114
A45	.1892	.1383	.1280	-.0621	.1144
A46	.2356	.2085	.1774	.0694	.2019
A44	-.0939	-.0544	-.0845	-.0400	-.0535
A43	.1615	.0187	.0280	-.0584	.0682
A195	.2750*	.2590*	.2739*	.2154	.2362
A196	.2666*	.1741	.2102	.0555	.2113
A47	.1833	.1301	.1792	.1200	.1979
A48	.1515	.1045	.1019	-.0954	.1016
A49	.0656	.1901	.1305	.1261	.2004
A165170	1.0000	.7857**	.8752**	.3051**	.8564*
A32	.7857**	1.0000	.9065**	.3700**	.8649*
A33	.8752**	.9065**	1.0000	.5190**	.8871*
A31	.3051**	.3700**	.5190**	1.0000	.4493*
A30	.8564**	.8649**	.8871**	.4493**	1.0000
A161	.8317**	.7687**	.8405**	.4531**	.8331*
A162	.6994**	.6685**	.7418**	.3547**	.7583*
A34	-.2089*	-.1889	-.2269*	-.0916	-.1407
A35	.9527**	.7310**	.8257**	.2979**	.8223*
A36	.0924	-.0082	.0661	-.1663	.0390

	A161	A162	A34	A35	A36
	-.0263	-.0376	-.0099	-.0949	.0033
	.0561	.0613	.0803	.0477	-.0792
	.2622*	.1286	-.2310	.1324	.2259
	.1291	.0545	-.0152	.0824	.2068
	.2160	.1004	-.1277	.1200	.2468
	.2857*	.2535	.0303	.1557	-.2645
	-.0763	.0333	.1194	.0159	.0689
	.2398	.2212	-.0114	.2488	.0506
	.0506	.1333	.0733	.1874	.1506
	.0989	.0003	.0229	.0087	.0150
	.2285	.3220*	.1633	.0805	.1007
	.0522	.1076	.0970	.0325	.0554
	.1275	.1439	-.2160	.1752	.1609
	.1569	.1356	-.1837	.1431	.1428
	.2167	.1673	-.1835	.2068	.1142
	.0089	.0340	.0651	-.0790	-.0059
	.1486	.0628	-.1692	.1074	.1147
	.3384**	.3030*	-.2321	.2268	.1668
	.2906*	.2934*	-.2075	.2423	.1953
	.2448	.2005	-.1235	.1721	-.0013
	.1050	.0824	-.1450	.1213	.1166
	.0666	.0819	-.0770	.0343	-.1157
	.8317**	.6994**	-.2089*	.9527**	.0924
	.7687**	.6685**	-.1889	.7310**	-.0082
	.8405**	.7418**	-.2269*	.8257**	.0661
	.4531**	.3547**	-.0916	.2979**	-.1663
	.8331**	.7583**	-.1407	.8223**	.0390
	1.0000	.8162**	.0167	.8343**	.0627
	.8162**	1.0000	.0262	.7160**	.1466
	.0167	.0262	1.0000	.0140	.0484
	.8343**	.7160**	.0140	1.0000	.0906
	.0627	.1466	.0484	.0906	1.0000

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

Appendix E2

Stability (Means & Correlations) of SII from 1984 to 1993/94

Variable (n = 61)	Mean (*SD*)		ANOVA		Correlation	
	1984	1993/94	t	$p <$	r	$p <$
realistic GOT	45.033 (10.371)	46.754 (9.791)	-1.05	.299	.1898	.143
investigative GOT	46.426 (11.845)	51.721 (9.536)	-3.33	.002	.2951	.021
artistic GOT	44.885 (11.035)	50.934 (9.377)	-4.07	.000	.3633	.004
social GOT	39.541 (13.315)	46.295 (10.769)	-3.74	.000	.3276	.010
enterprising GOT	44.607 (11.914)	41.984 (9.126)	1.40	.166	.0560	.668
conventional GOT	45.147 (12.724)	43.869 (9.113)	0.62	.539	-.0717	.583
agriculture BIS	43.951 (7.011)	43.115 (8.240)	0.78	.441	.399	.001
nature BIS	39.607 (11.296)	46.688 (11.205)	-2.60	.012	.406	.001
adventure BIS	50.525 (11.024)	54.246 (10.340)	-2.61	.011	.458	.001
military activity BIS	51.738 (10.890)	47.475 (9.976)	2.34	.023	.070	.591
mechanical act. BIS	48.344 (10.201)	50.639 (10.093)	-1.46	.150	.267	.037
science BIS	51.295 (10.316)	53.820 (8.814)	-1.65	.105	.224	.082
mathematics BIS	50.672 (10.809)	52.836 (10.317)	-1.21	.231	.125	.336
medical science BIS	46.525 (11.502)	47.246 (11.948)	-0.44	.664	.396	.002

Variable (n = 61)	Mean (SD)		ANOVA		Correlation	
	1984	1993/94	t	$p <$	r	$p <$
medical service BIS	48.361 (11.137)	48.066 (9.275)	0.19	.847	.328	.010
music/dramatics BIS	44.525 (10.774)	51.246 (9.345)	-4.70	.000	.391	.002
art BIS	47.279 (10.655)	50.525 (10.882)	-2.20	.032	.426	.001
writing BIS	44.688 (10.868)	51.164 (10.047)	-4.49	.000	.421	.001
teaching BIS	43.098 (12.881)	50.869 (10.864)	-4.43	.000	.343	.007
social service BIS	41.705 (9.651)	49.344 (11.247)	-4.68	.000	.264	.040
athletics BIS	45.787 (10.058)	48.279 (10.106)	-1.72	.090	.371	.003
domestic activ. BIS	43.426 (12.195)	49.426 (9.780)	-3.64	.001	.331	.009
religious activ. BIS	41.147 (8.964)	43.377 (8.192)	-1.62	.110	.221	.087
public speaking BIS	44.475 (9.906)	47.820 (9.880)	-2.17	.034	.257	.046
law/politics BIS	44.311 (9.969)	47.688 (9.688)	-2.24	.029	.285	.026
merchandising BIS	42.885 (9.632)	41.098 (9.758)	1.02	.314	-.004	.975
sales BIS	49.1148 (8.466)	43.180 (7.643)	3.91	.000	-.079	.544
business mgmt. BIS	43.262 (12.323)	41.902 (9.803)	0.70	.487	.069	.599
office practices BIS	49.016 (10.557)	45.623 (7.862)	1.97	.053	-.046	.723
total of 6 GOT scores	265.639 (63.764)	281.557 (40.661)	-1.82	.074	.202	.119

Variable (n = 61)	Mean (SD)		ANOVA		Correlation	
	1984	1993/94	t	$p <$	r	$p <$
# GOT > "mod. high"	1.115 (1.967)	1.361 (1.438)	-0.85	.401	.138	.288
# BIS > "mod. high"	4.820 (5.792)	6.459 (4.380)	-1.94	.058	.177	.171
# Holland categ. w/ OS > 40	3.492 (1.273)	4.541 (1.058)	-4.86	.000	-.040	.760
% "likes"-- occupations	22.656 (19.914)	25.984 (14.231)	-1.10	.274	.079	.544
% "likes"-- school subjects	32.000 (24.673)	41.197 (19.668)	-2.85	.006	.369	.003
% "likes"-- leisure activities	32.885 (17.626)	39.033 (16.265)	-4.86	.000	.315	.014
academic comfort	39.885 (17.626)	49.279 (14.972)	-4.13	.000	.415	.001
intro/ extraversion	59.869 (15.033)	51.262 (12.202)	4.38	.000	.378	.003
Holland differentiation	15.6557 (5.896)	20.492 (6.027)	-4.79	.000	.123	.343
Iachan differentiation	24.918 (4.845)	27.082 (3.358)	-3.05	.003	.121	.352
consistency	2.311 (0.743)	2.492 (0.649)	-1.35	.181	-.116	.374