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Stability of career aspirations: a test of Gottfredson's theory of circumscription and compromise

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Stability of career aspirations: A test of Gottfredson's theory of circumscription and compromise

by

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A thesis submitted to the graduate faculty
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Abstract

Gottfredson's (1981) developmental theory of career choices was evaluated using longitudinal data. This study builds on previous research into Gottfredson's model by addressing methodological issues in the confounding of sex type, prestige, and interest measures when measuring expressed career choices by statistically controlling for the inter-relations among these variables in the analyses. Participants were 2,353 women enrolled at the Seven College Conference Schools and 321 men enrolled at Harvard and Vassar. Expressed career preferences were coded for sex type, prestige, and the Things/People and Data/Ideas interest dimension. Stability of expressed career choices over a one year period and discrepancies between current career choices and idealized aspirations were analyzed using partial correlation analyses to control for the non-independence of the constructs. Gottfredson's (1981) theory was not supported for either men or women, because prestige and the Things/People dimension of interest were found to be more stable than sex type. Implications for re-conceptualizing Gottfredson's theory are discussed, along with implications for research and practice.

Chapter 1. Introduction

Choosing a career is a complex developmental process that begins in childhood when individuals first learn about the world of work. As individuals advance through the educational system, they learn more about different career opportunities and also develop an understanding of their own aspirations and potential matches with different career choices. Ultimately, this process includes many factors such as interests, abilities, skills, values, goals, aspirations, and perceptions of the labor market (Holland, 1997). A number of theories have been put forward to describe the career choice process, with one approach being the developmental model proposed by Linda S. Gottfredson in 1981. Gottfredson's theory of Circumscription and Compromise includes hypotheses that account for gender and class differences in career development, providing a model of how young people recognize and handle, or fail to handle, the wide range of vocational choices that are available in the world of work. This study evaluates Gottfredson's theory, with a focus on the compromise process, using a longitudinal data set including measures of expressed career choices and measures of factors that influence the compromise process.

Chapter 2. Literature Review

Gottfredson's Theory of Circumscription and Compromise

Gottfredson's theory outlines four developmental processes that are vital to the vocational choice process: Cognitive Growth, Self-Creation, Circumscription, and Compromise. Gottfredson (1981) suggests that perceptions of the world of work and vocationally relevant decision making begin long before individuals are cognitively proficient or fully aware that they are making such decisions. Therefore, although a large portion of the vocational choice process occurs in adolescence and early adulthood, cognitive growth in childhood also greatly impacts this process and must be taken into account. The world is a complex place that children gradually become more able to understand and analyze. Through the process of maturation and experiences in school, thinking changes from intuitive in the preschool years, to concrete in elementary years, and to abstract in adolescence (Gottfredson, 2005). Two aspects of the world of work that are affected by children's cognitive growth are their cognitive map of occupations and their self-concept.

The cognitive map of occupations is defined by Gottfredson (2002) as an organizational framework of the images people hold of occupations, as well as images of the personalities of people in those occupations, the work they do, the lives they lead, the rewards and conditions of the work, and the appropriateness of that work for different types of people. These images are thought to be consistent for Americans from all segments of society. As illustrated in Figure 1, the dimensions underlying the map are masculinity-femininity, occupational prestige level (overall desirability), and field of work. Some of the first distinctions that children are able to draw between people and

jobs are those of concrete, visible attributes, but over time the cognitive map becomes more complex, involving multidimensional comparisons. As children learn more about the world of work they begin to integrate their inferences about internal states, detection of patterns in behavior, and motivations for pursuing a career become part of their model of the world of work.

The self-concept, which Gottfredson (1981) defines as the individual's view of one's self both publicly and privately, is also developed in childhood. Gottfredson (2005) describes the second developmental process of self-creation, the creation of the self-concept, as an active process that is not just the product of genes or environment. Instead, we help construct who we are by interacting with the world. Our unique genetic make-up leads us to seek certain experiences as well as avoid others. We also create different environments by evoking different responses from those around us, and thus develop a unique sense of self (Scarr, 1995). Additionally, over time, as individuals develop and mature, there are also increasing opportunities for individuals to choose environments that are consistent with their self-concepts (Armstrong, Day, McVay, & Rounds, in press; Hogan & Roberts, 2004)

The third developmental process is that of circumscription. During this process occupational alternatives that conflict with the self-concept are eliminated. More alternatives and even groups of alternatives are eliminated as children are able to perceive new and more abstract dimensions of suitability or compatibility. Gottfredson (2005) describes four stages of this developmental process. The first stage aligns with the preschool years (ages 3 to 5) and is termed orientation to size and power. Children in this stage move from magical to intuitive thinking, and achieve object constancy. They begin

to classify people in simple ways, such as big and powerful (adults) versus little and weak (children).

The second stage of circumscription is orientation to sex roles, and occurs from ages six to eight. Thinking in this stage has moved to concrete terms and allows simple distinctions to be made. Children in this stage begin to recognize more occupations. They rely on visible aspects of people to make distinctions among people, and the most salient is that of gender. Distinctions are made with such visible attributes such as clothing, hair, and typical activities. Thinking in this stage is rather dichotomous, therefore occupations are seen as belonging to either one gender or the other. One's own sex also tends to be seen as superior, and adhering to appropriate gender roles is seen as critical. While children's views of the world will become more complex as they age, certain occupational alternatives have already been eliminated based on their current understanding of the world.

Orientation to social valuation is the third stage of circumscription and generally takes place between the ages of nine and thirteen. Thinking in this stage has become more abstract, and therefore more occupations can be recognized even though they may not be directly visible. Children in this stage begin to notice status hierarchies and become more sensitive to social evaluation. In the early part of this stage status is linked with obvious symbols such as clothing, behavior, and possessions. In the latter part of the stage, prestige (status) is understood and used to rank occupations much as adults do. Children in this stage have also begun to understand the link between income, education, and occupation. Based on their understanding of prestige, children in this stage begin to set floor and ceiling levels for their aspirations.

During the process of setting acceptable levels, some occupations will be judged as unacceptably low in social standing (the tolerable-level boundary in Figure 1). On the other hand, some occupations will be judged as too difficult to achieve with a reasonable amount of effort, or as having too high a risk of failure (the tolerable-effort boundary in Figure 1). Based on these boundaries, large sections of an individual's occupational map are disregarded for being the wrong sex type, unacceptably low level of prestige, or unacceptably difficult to achieve. What is left of the occupational map is then termed the *Zone of Acceptable Alternatives* or social space. Occupational paths no longer in the zone of acceptable alternatives are psychologically considered closed to the child and information about these paths may be ignored even if presented to the individual. This process may unduly restrict the zone of acceptable alternatives, disregarding options that might be a good fit with the individual's interests.

The final stage of circumscription is orientation to the internal, unique self which occurs after the age of fourteen. Elimination of possible alternatives in the early stages is often an unconscious process for children, which then becomes a conscious process in this final stage. Cognitive growth that has occurred brings about understanding of abstract, internal, and unique aspects of individuals and occupations. Adolescents are now able to recognize and understand factors such as interests, abilities, and values that relate to themselves as well as occupations. While their interests, abilities, and values may not be completely clear to the adolescent, they begin to use these factors in a multi-dimensional matching process to find occupations that would be personally fulfilling. In this stage adolescents begin to face decisions about which occupational paths to pursue and about the steps necessary to start down that path (i.e. what classes to take).

An important component of this stage is the development of idealistic and realistic aspirations. An idealistic aspiration is that which is most favored by the adolescent. However, the most favored aspiration may not be the most realistic aspiration. Realistic aspirations are those that are less desirable but still acceptable, and which are perceived as more accessible. As more is learned about the world of work, adolescents begin to relinquish their idealistic aspirations for the more realistic, accessible ones. This is the process Gottfredson terms compromise.

Earlier in the career development process, individuals were choosing which occupations to keep in their social space, but when individuals are forced to choose a less desirable alternative the process turns from choice into compromise. Compromise can be a painful process for the individual when they feel forced to let go of one of their ideal aspirations. Gottfredson was interested in why young people know so little about the accessibility of occupations, how their own behavior influences the actual accessibility, and which dimensions of compatibility individuals are least and most willing to give up when they are forced to choose a less acceptable alternative.

To answer the question about why young people know so little about the accessibility of occupations, Gottfredson (2005) proposed that individuals cut search costs by only searching for information about the occupations they are most interested in. While this approach may save time and effort, the result means the knowledge an individual has about the accessibility of different occupations is quite limited. In terms of how an individual's behavior affects the actual accessibility of occupations, the more people explore available opportunities and the more they enhance their own competitiveness for those opportunities the accessibility of occupations will increase.

Differences between individuals in personal skill, initiative, and persistence will change the amount of information they have and therefore the number of occupations that are accessible to them. Because of this increase, the amount of compromise that will be necessary will be decreased.

Gottfredson (2005) also argued that people will look for jobs that are accessible and are also a “good enough” match for sex type, prestige level, and field of work. These good enough options are considered sufficient and easier to determine and locate than less accessible alternatives. When a good match is not available, people then must determine which dimension of match to give up first. Gottfredson proposed that the dimensions closest to the core of the self-concept will be most protected and the last to be given up. The dimensions closest to the core of the self-concept are those that developed earliest, with sex type as the first dimension developed, prestige level second, and field of work (interests) last. Gottfredson also predicts that dimensions closer to the core of the self-concept will be those least likely to be compromises. Therefore, based on this order of development, individuals are expected to compromise on interests first, prestige level second, and on sex type last.

Research on Gottfredson’s Theory

Research on Gottfredson’s theory of circumscription and compromise has covered many of the theoretical components such as the cognitive map, social space, stages of circumscription, as well as the influence of gender, social class, and intelligence on the process of circumscription. However, much less research has been conducted concerning the process of compromise, and what has been conducted report inconsistent findings.

A primary focus of compromise research has been to develop experiments to evaluate which aspects of occupational aspirations an individual will compromise to maintain a desired level of another aspect. Results obtained in experimental studies have not consistently supported the relative importance of different aspects in the compromise process as outlined by Gottfredson (1981). For example, Leung and Plake (1990) reported that prestige level was not compromised to maintain gender traditionality by college students as is predicted. However, contrary to the findings of Leung and Plake (1990), Pryor and Taylor (1986) found that prestige level was typically compromised to maintain interests and sex type, though this pattern does not fully follow Gottfredson's predictions either. In a study by Hesketh, Elmslie, and Kaldor (1990) with both career dissatisfied adults and high school students, interests were rated as more important than level of prestige, and prestige was rated as more important than level of sex type, a pattern directly opposite the pattern Gottfredson predicts. After such mixed results, Vandiver and Bowman (1996) suggested that perhaps a more complex process underlies compromise and that a revision of Gottfredson's (1981) theory was necessary to explain the mixed findings. In 1996 Gottfredson did just that, revising her theory by formulating the principle of conditional priorities in compromise.

The principle of conditional priorities as proposed by Gottfredson (1996) asserts that the importance of sex type, prestige, and interests relative to each other depends on the severity of the compromise being made. A reversal in priorities is predicted as the severity of compromise increases. When choosing among unacceptable alternatives (major compromise situation), sex type will be protected most because it offers the greatest threat to the self-concept. After sex type, prestige will be protected next,

followed by interests. This is the order predicted in the original theory; but the order changes for the moderate and minor compromise situations. Gottfredson argued that when choosing among acceptable alternatives (minor compromise situation), a basic threshold of sex type and prestige are met, allowing the individual to compromise on these aspects in order to maintain interests. The inclusion of the thresholds concept indicates that people require a certain level of both sex type and prestige, but that above that threshold the individual will be more flexible.

A search of the literature indicates that at least one study has been conducted addressing the principal of conditional priorities in compromise. Blanchard and Lichtenberg (2003) conducted an experimental study with college students in which the students were placed in one of three conditions, a minor, moderate, or major compromise condition. Students were then asked to rank a set of eight occupations from least to most preferred, and the most preferred occupation was compared to their ratings of interests, prestige, and sex type. Gottfredson's (1996) prediction of order of importance was supported in the minor compromise group, with interests being rated highest, followed by prestige, and then sex type. However, for the moderate and major compromise groups, only partial support was found. In the moderate condition, prestige was rated higher than interests, but neither prestige nor interests were rated higher than sex type as predicted. In the major condition, sex type and prestige were rated the same, rather than sex type being rated higher. However, both sex type and prestige were rated higher than interests as predicted.

Most of the research about compromise has involved simulations of the compromise process where individuals are asked to rank or pick occupations from lists

(Hesketh, Durant, & Pryor, 1990; Holt, 1989; Leung, 1993; Leung & Plake, 1990; Taylor & Pryor, 1985; Blanchard & Lichtenberg, 2003). As noted by Armstrong and Crombie (2000), there are a number of potential limitations to this type of research. First, the experimental design used to evaluate compromise may have limited validity because these experiments do not necessarily evaluate the individual career aspirations of participants due to the fact that the range of job titles included in these experiments are limited. The use of preset choices makes it easier to test Gottfredson's model and to make comparisons between the different aspects being compromised, but the compromises being made by participants may not reflect their own choices. A second limitation of this research is a lack of longitudinal studies. Gottfredson's definition of compromise implies a developmental process that is not captured in a cross-sectional research design. A third limitation is the inability to assess the individual's perceptions of the need for compromise. In ranking or forced choice measures all participants must make compromises, irrespective of their perceptions of the need to compromise.

Armstrong and Crombie (2000) have suggested that conclusions about the compromise process obtained in simulated compromise research require validation in research that examines compromises in expressed occupational choices over time. Additionally, it may be necessary to differentiate between those individuals who perceive the need to compromise and others who view their aspirations as realistic choices.

To evaluate the compromise process, Armstrong and Crombie (2000) used a longitudinal design contrasting the expressed career aspirations and expectations of high school students over a three year period. In this study, individuals were identified who believe that their aspirations are unrealistic or unattainable on the basis of their expressed

career choices. Armstrong and Crombie hypothesized that individuals who reported that their aspirations were different from their expectations would be more likely to make compromises by changing the prestige level and gender traditionality of their aspirations over time than would individuals who viewed their aspirations as realistic choices. The results obtained in this study supported Gottfredson's model, in that some students who expressed discrepant aspirations and expectations changed their aspirations over time in the direction of their expectations. However, some individuals expressed career expectations that were higher in prestige or more gender traditional than their aspirations, and the changes in aspirations and expectations of these individuals do not necessarily match Gottfredson's model. Additionally, the results obtained by Armstrong and Crombie do not provide much insight into the factors that may influence the stability of aspirations, perceptions of the need for compromise, and the direction of changes in expressed career choices.

Another important issue with research into the compromise process is the fact that the variables of sex type, prestige, and interests are not independent. As illustrated in Figure 2, sex type and prestige are confounded; male sex typed occupations cover a much wider range of prestige than female sex typed occupations do. Specifically, female sex typed jobs are more moderate in prestige level, with few to no very high or very low prestige level jobs. Sex type and interests are also confounded. Investigative occupations are fairly neutral in sex type, but are somewhat masculine. Social, Artistic, and Conventional occupations are female sex typed, whereas Enterprising and Realistic occupations are male sex typed. Additionally, interests and prestige are also confounded. Investigative occupations are mostly of a high prestige level, whereas Social,

Enterprising, and Artistic are mostly a moderate level of prestige. And finally, Realistic and Conventional occupations are mostly moderate or low in prestige level (Gottfredson, 1981). As can be seen from this information, interests, prestige, and sex type are far from independent of each other.

This non-independence in measures is acknowledged in Gottfredson's (1981) original theory and in earlier discussions of the career choice process (e.g., Fryer, 1931, pp. 143-188). However, attempts to address the confounding of these constructs in research is often limited to an acknowledgement of the issue. Other studies have attempted to address the issue with limited success. For example, Blanchard and Lichtenberg (2003) stated that they addressed the overlap between constructs by defining prestige and interests for the participants, as well as by focusing on participants' independent perceptions of these variables rather than on predetermined values. However, no manipulation check was performed to assess for the success of this approach, and it is unclear if these instructions would be sufficient to control for the confounding of dimensions. Other studies have approached the issue from a statistical standpoint. For example, Hesketh, Elmslie, and Kaldor (1990) used policy-capturing and multiple regression procedures to examine the relative contributions of each variable. However, most studies do not address this issue at all, making it virtually impossible to understand the true contribution of sex type, prestige, and interests in the compromise process based on current research.

Holland's Theory of Vocational Personalities

Over the years there have been a variety of models proposed to describe the structure of vocational interests, but Holland's (1973) proposed model has received the

most interest in the past 30 years and has become the standard model for understanding vocational interests and environments (Borgen, 1986). Holland's (1997) theory of vocational personalities and work environments states that people and environments can be characterized into six personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. These types are referred to collectively as the RIASEC model. Each type description represents a theoretical or ideal type that summarizes what we know about people in a range of certain occupations, including interests, values, goals, self-beliefs, and problem-solving style. Environments of each are said to be dominated by one of the personality types. Each personality type has a unique constellation of attitudes and skills as well as seeking and processing information in different ways. The types are seen as active in that they both seek and avoid certain environments, problems, and tasks.

Realistic. Individuals of the Realistic type prefer activities that include explicit, ordered, or systematic manipulation of objects, tools, machines, and animals. These individuals prefer Realistic occupations such as mechanic or farmer where preferred activities such as working with their hands or physical activities can be engaged in, and un-preferred activities such as working with people can be avoided. When solving problems individuals of this type may prefer concrete, practical, and structured solutions. Holland (1997) describes the personality of a Realistic type as conforming, materialistic, dogmatic, robust, persistent, and practical.

Investigative. Individuals in the Investigative type tend to prefer activities that include observational, symbolic, systematic, and creative investigation of physical, biological, and cultural phenomena in order to understand and control such phenomena.

Individuals of this type tend to prefer occupations such as medical technologist or biologist in which they can exercise their preferred activities and unique skills.

Investigative individuals often value scientific and scholarly activities, self-determination, and personal traits such as intelligence, logicalness, and achievement. Their values tend to be liberal and they are open to new ideas and experiences. They enjoy reading and thinking about problems and their solutions, and approach this through the use of thinking, information gathering, careful analysis, objective data, and other related scholarly practices. Holland (1997) describes the personality of the Investigative type as being analytical, independent, rational, introspective, critical, and retiring.

Artistic. Those of the Artistic type prefer ambiguous, free, unsystematized activities that entail the manipulation of physical, verbal, or human materials to create art forms or products. Occupations that Artistic individuals often prefer are interior decorator, writer, or actor. Aesthetics are highly valued by Artistic individuals, as well as self-expression and equality for all, imagination, and courage. An Artistic individual may see themselves as expressive, open, original, intuitive, liberal, nonconforming, introspective, independent, and disorderly.

Social. Individuals in the Social type prefer activities that entail the manipulation of others to inform, train, develop, cure, or enlighten. These preferences tend to lead to human relations competencies and a preference for occupations such as teaching and counseling. Social individuals value social and ethical activities and problems. They tend to want to serve and be helpful to others in situations such as medical support, institutional service, or reciprocal interaction. Social individuals often see themselves as someone who likes helping others, understands others, has teaching ability and social

skills. Problems are often viewed in human relations terms and social competencies and traits dominate the problem-solving process. Holland (1997) describes the Social personality type as being helpful, responsible, empathetic, understanding, friendly, and generous.

Enterprising. Individuals of the Enterprising type prefer activities that entail manipulation of others to attain organizational goals or economic gain. These preferences lead them to acquire leadership, interpersonal, and persuasive skills. Managers and sales personnel are examples of typical Enterprising occupations. The values of Enterprising individuals are traditional, including economic and political achievement values. They also value controlling others, being free of control, and being ambitious. Enterprising individuals may see themselves as somewhat aggressive, popular, self-confident, sociable, and possessing leadership and speaking abilities. They may view problems in terms of social influence, and apply their specific skills to problem solving.

Conventional. Individuals in the Conventional type tend to prefer activities that entail the explicit, ordered, systematic manipulation of data. Examples of this can be keeping records and filing materials. Conventional individuals are often in occupations such as bookkeeper or banker. Business and economic achievement are high values for the Conventional individual, and they may believe that becoming an expert in finance or commerce, leading a comfortable life, and doing a lot of work are important goals. They may perceive themselves as orderly and as having clerical and numerical ability. When solving problems a Conventional individual is likely to use established rules, practices, and procedures. Holland (1997) also uses the adjectives inflexible, persistent,

methodical, obedient, efficient, and unimaginative to describe the Conventional personality type.

Structure of RIASEC Types

The six RIASEC types are described in terms of a two dimensional hexagonal model in which the types are arranged in the RIASEC order (See Figure 3). Holland's (1997) calculus hypothesis states that the relationships among types are inversely proportional to the distances between them. That is, the closer two types are in the hexagonal model, the greater the similarity is between them. For example, the adjacent types of Artistic and Social are more similar to each other than are Artistic and Enterprising. Types that are opposite to each other in the hexagon are seen as having opposite preferences. For example, individuals of the Artistic type prefer unstructured and creative activities, and dislike the organized and predictable activities of an individual of the Conventional type.

Meta-analyses of studies reporting correlations between RIASEC interest types has generally supported the structure of Holland's theory, although there is some question about the fit with U.S. minority group samples and international samples. In a comprehensive meta-analysis of the research, Rounds and Tracey (1996) compared the fit of RIASEC correlation matrices from 20 U.S. ethnic group samples and 76 international samples to a U.S. benchmark group of 74 matrices, and reported that the fit of the data to a quasi-circumplex model was a better fit for the benchmark samples than for the U.S. ethnic groups and international samples. Day, Rounds and Swaney (1998) examined the fit of Holland's model with large representative samples of college-bound students, and found a good fit for with both male and female African Americans, Asian Americans,

Caucasian Americans, Hispanic Americans, and Native Americans. Fouad, Harmon, and Borgen (1997) reported similar results to those of Day and colleagues with large representative samples of successfully employed adults from different U.S. racial-ethnic groups, although the fit was questionable for some of the female groups and male minority groups. Anderson, Tracey, & Rounds (1997) examined 14 Strong Interest Inventory matrices, and found that the fit of the RIASEC model to be similar for both males and females.

Underlying Dimensions of Interests

Holland's model of interests can be represented using a two dimensional structure (Rounds, 1995). Prediger (1982) proposed using the dimensions of Data/Ideas and Things/People to represent the underlying structure of the RIASEC types. Definitions of the categories from Prediger (1981) are listed here. The data category can be defined as "impersonal tasks involving facts, records, files, numbers, and systematic procedures for assisting goods/services consumption by people" (p. 22). People who work primarily with data are agents, bookkeepers, and air traffic controllers (Prediger, 1982). Ideas tasks are: "Intrapersonal tasks involving abstractions, theories, knowledge, insights, and new ways of expressing something (for example, with words, equations, or music)" (p. 22). Examples of people who work with ideas are scientists, composers, and philosophers. Things tasks can be defined as "Nonpersonal tasks involving machines, materials, tools, biological mechanisms, and so forth" (p. 22). People who work mainly with things are bricklayers, laboratory technicians, bus drivers, and chemists. The last category, people tasks, can be defined as: "Interpersonal tasks such as caring for, persuading, entertaining, or directing others (including animals treated as if they were human)" (p. 22). Elementary

school teachers, social workers, vocational counselors, and salespersons are people who work primarily with people.

The two dimensions Prediger (1982) postulated were proposed as bi-polar dimensions. The Data/Ideas dimension is a vertical dimension with the lower pole being associated with Holland's Artistic and Investigative type, and the upper pole being associated with Holland's Enterprising and Conventional types. The Things/People dimension is a horizontal dimension that corresponds to Holland's Realistic and Social types (See Figure 3). In a study by Prediger (1982), the Data/Ideas and Things/People dimension were found to account for 94% of the variance in interests that could be accounted for by two dimensions.

Gender Differences in Interests

While gender differences in the structure of interests have not been supported (Ryan, Tracey, & Rounds, 1996; Anderson, Tracey, & Rounds, 1997), gender differences have been found in the strength of interests (Lippa, 1998). More specifically, gender is strongly related to the Things/People dimension. Women tend to be more on the People side, while men tend to be more on the Things side of the dimension. Gender as measured by gender diagnosticity (GD) and bi-polar Masculinity-Femininity (M-F) was related to the Things/People dimension, but not to the Data/Ideas dimension (Lippa, 1998). Lippa suggests that Things/People might actually be viewed as an M-F or a sex-typing dimension within the sexes and a gendered dimension across the sexes. Lubinski (2000) reported that effect sizes computed by Lippa for the gender differences in the Things/People dimension were all greater than 1.20, "reflecting perhaps the largest of all sex differences on major psychological dimensions."

Interest researchers have recently begun looking at prestige and sex type as components of interests. In 1996, Tracey and Rounds proposed that there is a third dimension underlying interests that can be labeled prestige, identified through the use of a principal components analysis. Einarsdottir and Rounds (2000) conducted a study to evaluate whether the third dimension proposed by Tracey and Rounds (1996) could be found utilizing a different methodology. With the use of multi-dimensional scaling, the results of Einarsdottir and Rounds supported a three-dimensional structure of interests. However, unlike Tracey and Rounds (1996), they titled the third dimension sex type. They found that sex type accounted for 52% of the variance, whereas prestige only accounted for 32-40% of the variance. They also based their decision on Gottfredson's contention that sex type is more fundamental in career decision making. After their test of career compromise, Hesketh, Elmslie, and Kaldor (1990) contended that interests are a compound construct which incorporates the elements of sex type and prestige. Einarsdottir and Rounds stated that their results supported Hesketh, Elmslie, and Kaldor's (1990) view of interests. A recent study by Deng, Armstrong, and Rounds (2007) fit the RIASEC model to US occupations used a dimensional analysis that allowed for testing whether prestige and sex type dimensions are confounded. Deng et al.'s results clearly indicated that prestige and sex type are embedded in Holland's model of interests and are confounded with it. Prestige was found to be orthogonal to both sex type and Things/People, and negatively associated with Data/Ideas. Sex type was found to be nearly parallel to Things/People, as well as being practically orthogonal to Data/Ideas.

This study will seek to test Gottfredson's theory of circumscription and compromise in two ways. First will be a direct test of Gottfredson's (1981) predictions

that dimensions earlier in development and hence closest to the core of the self-concept will be relinquished last in the compromise process. Gottfredson (1981) has proposed that orientation to sex roles is the second stage in the circumscription process, and thus is central to one's self-concept and will be most protected in the compromise process. She proposed that prestige will be the next most protected, followed by interests.

Gottfredson's (1996) addition of the principal of conditional priorities will not be addressed in this study based on the nature of the data. Instead, we will focus on a more clear understanding of the original theory through the use of regression analyses to account for the non-independence of sex type, prestige, and interests.

The second approach taken will be to test the theory from the perspective of interests as a compound construct that incorporates both sex type and prestige. This study will first seek to replicate Lippa's (1998) findings of gender differences along the Things/People dimension and not along the Data/Ideas dimension. The stability of interests along the Things/ People dimension will be compared to the stability of interests along the Data/Ideas dimension. Because the Things/People dimension has been found to be a gendered dimension (Lippa, 1998), it would follow from Gottfredson's theory that this dimension should be more guarded than the Data/Ideas dimension and thus more stable over time. The comprehensive meta-analyses of vocational interest stability by Low, Yoon, Roberts, and Rounds (2005) has demonstrated that interests are very stable over time ($r = .63$, $CI = .62, .65$). The authors also found that interests reached a plateau during early adulthood (ages 18-21.9), the age period in which the sample of the present study were assessed. Therefore, changes over time in these dimensions of career aspirations in Gottfredson's model are likely to indicate a compromise in career choice

rather than a change in interests. While evidence for some aspects of Gottfredson's theory is much replicated and meta-analyzed, evidence for priorities in compromise is sparsely reported. This area of research is lacking and in need of further exploration.

An archival data set will be utilized in this study. The data set was collected as part of the Seven College Study, a research project designed to assess the changing goals of men and women at seven highly selective colleges in the Northeast (Zuckerman, 1988). The sample consists of nearly 6,000 participants, which is a substantial sample size. In addition, the data set is longitudinal in nature, making it ideal for assessing the stability of interests.

The use of this longitudinal data set will address many of the limitations of previous Gottfredson-based research identified by Armstrong and Crombie (2000). First, in the seven colleges data set, participants were not asked to choose from preset choices, but were allowed to indicate any occupation they wished in an open ended question. Second, because the data set is longitudinal, this will help address the developmental aspect of Gottfredson's theory by examining stability of expressed choices over time. The third limitation of previous research is that of the inability to assess the individual's perception of the need for compromise. In simulation studies using forced-choice ranking, participants are required to compromise regardless of whether they see a need for compromise. In the seven colleges data set, participants are asked directly about their perceptions of the need for compromise, as well as being allowed to indicate no compromise if they have not found it necessary.

Chapter 3. Methods

Participants

The original sample consisted of 8,731 participants, 1,015 men, 5,312 women, and 2,404 participants who did not report their gender; women were enrolled at the Seven College Conference Schools of Barnard, Bryn Mawr, Mount Holyoke, Radcliffe, Smith, Vassar, and Wellesley and men were enrolled at Harvard and Vassar Colleges. Of the original sample, 67% (628 men and 2,514 women) had complete data at time one. Based on the nature of the analyses assessing for stability of aspirations over time, participants who did not complete the questionnaire at time two were excluded. A final sample (46% of the original sample) of 321 men and 2,353 women remained after exclusionary criteria. Participants ranged in age from 16 to 47 years ($M = 19.13$, $SD = 1.40$), were predominantly Caucasian (80.3%), followed by Oriental (6.4%), black (4.8%), Hispanic (2.5%), other (1.4%), and 4.6% did not report their race. Participants were primarily single (99.5%), and were from highly educated family backgrounds with over half of the fathers and over a quarter of the mothers holding graduate degrees.

Instruments

Occupational aspirations were assessed with an open ended question which stated “What career do you currently plan to pursue? If you are undecided, name the career that currently appeals the most to you.” Participants were allowed to indicate any career they chose. Their response was then coded as one of 72 categories, such as architect/urban planner, dentist, or psychiatrist.

Compromise was assessed with a yes-no response question that stated “Sometimes people feel their career plans are the result of some kind of compromise with

what they really want to do. What about you? Does your current career choice represent a compromise at all?" Participants were asked to indicate "No, it does not represent a compromise", "Yes, it's a bit of a compromise for me", or "Yes, it's very much a compromise for me". A no response was coded as one, yes, a bit was coded as two, and yes, very much was coded as three. If participants indicated either of the yes responses they were then asked to answer an additional question. The question addressed what the participants ideal occupation would be if compromise were not necessary; "What other occupation would you like if this compromise were not necessary?" Response format was again open ended, allowing the participant unconstrained choices and coding was the same as for current occupational aspiration.

Procedures

Data were collected as part of the Seven College Study, a research project designed to assess the changing goals of men and women at seven highly selective colleges in the Northeast. Questionnaires were distributed to a random sample of students from the classes of 1981-1984 in February 1981. Participants were informed that they could omit questions, decide not to participate in the study at all, or choose not to participate in the follow-up studies in future years. Participants were also informed that the data would be contributed to the Murray Research Center. Students who did not complete the questionnaire within a month were encouraged to do so through follow-up letters, phone calls, or by personal reminders of dormitory counselors. Response rate was over 75%, resulting in a sample of almost 6,000 participants. A follow-up questionnaire was given to the classes of 1982-1984 in 1982. A second follow-up was distributed in 1983-1984 to the class of 1984 (See Table 1). Due to the small number of participants

who completed the second follow-up (N = 914) relative to the total sample size, data from the second follow-up will not be used in the present analyses.

The questionnaires distributed to the women and men were identical, and took approximately 30 minutes to complete. The questionnaires included information on demographic and family background, career aspirations, occupational compromise and reasons for compromise, as well as ideal occupational aspirations. The questionnaires also included information about career values, family goals, self-esteem, self-concept, interpersonal self-confidence, stress, stress reaction, and attitudes toward college programs and services. These items will not be reported in this paper.

Hypotheses

The first hypotheses to be addressed are to test Gottfredson's prediction of the order in which aspects of aspirations are compromised. It is expected that after controlling for the confounding in measures of sex type, prestige, and interests, sex type will be more stable than prestige, prestige will be more stable than interests, and therefore, sex type will also be more stable than interests. To fully evaluate this hypothesis, the stability of each construct will be examined both before and after controlling for the confounding of measures, thereby allowing for an examination of the relative impact of the inter-relations among measures on the stability estimates. Second, Lippa's (1998) findings in regards to gender differences in interests will be evaluated. It is predicted that there will be a significant mean difference in Things/People dimension scores for men and women. It is also expected that there will not be a significant mean difference in Data/Ideas dimension scores for men and women. And third, Gottfredson's (1981) predictions of the order of compromise will be examined within the context of

Prediger's (1982) interest dimensions. It is predicted that expressed occupational aspirations will be more stable on the Things/People dimension than on the Data/Ideas dimension because of the gendered nature of Things/People (Lippa, 1998).

Design and Analyses

In order to perform the necessary analyses, the original data set was recoded with information from the Occupational Information Network (O*NET) version 10.0 (USDOL, 2006), and from the Dictionary of Holland Occupational Codes (Gottfredson & Holland, 1989).

Sex type. To construct a measure of sex type for each occupation, occupations were coded according to the percentage of female employees in that occupation using the Dictionary of Holland Occupational Codes from 1989. Sexual stereotypes of occupations have been found to be held in agreement by both men and women (Shinar, 1975; White, Kruczek, Brown, & White, 1989), and a high correspondence between the sexual stereotypes of occupations and the proportion of men and women in the jobs has been found (Cooper, Doverspike, & Barrett, 1985; White et al., 1989).

*O*NET.* The U.S. Department of Labor has developed the Occupational Information Network (O*NET), a database that uses a common language for collecting, describing, and presenting valid, reliable occupational information about work and the worker (Dye & Silver, 1999). The O*NET content model describes and presents numerous variables needed to describe the world of work. The O*NET database will be accessed for occupational codes and vocational interest data in the proposed study.

*O*NET-SOC Code.* The O*NET-SOC system (Standard Occupational Classification) includes 949 occupational titles. Occupations are classified based upon

work performed, skills, education, training, and credentials, and is then given an O*NET-SOC code. This process was established to help occupational information users relate a job title or occupational specialty to an O*NET-SOC occupation (National Center for O*NET Development, 2006). Participant's current career aspiration and ideal career aspiration were coded by the original researchers into 72 categories such as accounting/actuary, psychologist, and athlete/coach. Each category will then be assigned an O*NET-SOC code. For example, the O*NET-SOC code for athlete is 27-2021.00.

Occupations are classified at four levels, major group, minor group, broad occupation, and detailed occupation. There are 23 major groups, 96 minor groups, 449 broad occupations, and 821 detailed occupations (USDOL, 2004). Athlete, SOC code 27-2021.00, will be used here for demonstration of the classification system. The first number in the athlete code, 27, indicates that this occupation is in the major group of Arts, Design, Entertainment, Sports, and Media Occupations. The first part of the second number, 20 of 2021, indicates the minor group of this occupation which is Entertainers and Performers, Sports and Related Workers. The second part of the second number, 21 of 2021, indicates the broad occupation which for athlete is Athletes and Sports Competitors. The number following the decimal point, .00, indicates that there are not any detailed occupations listed under the broad occupation of Athletes and Sports Competitors.

Prestige. A measure of prestige will be constructed from three variables, vocational preparation needed, a composite score of two need-reinforcers (recognition and social status), and mean annual salary using the method of Deng, Armstrong, and Rounds (2007). Vocational preparation required for each occupation was obtained from

the Dictionary of Holland Occupational Codes (Gottfredson & Holland, 1989). Specific Vocational Preparation (SVP) ratings indicate the training time required by an occupation, including training in school, at work, in the military, or through hobbies, but they exclude education that is not specifically vocational in nature. SVP ratings are on a nine-point scale where one equals short demonstration only, two equals anything beyond a short demonstration (up to and including 30 days), three equals 30 days to three months, four equals three to six months, five equals six months to 1 year, six equals one year to two years, seven equals two years to four years, eight equals four years to ten years, and nine equals over ten years of preparation.

Need-reinforcers, derived from the Theory of Work Adjustment (Dawis & Lofquist, 1984), characterize the nature of the work and the conditions in work environments. *Social Status* refers to the extent that workers in the occupations “would be looked up to by others in the company and the community.” *Recognition* refers to the extent that workers in the occupation “receive recognition for the work they do.” Need-reinforcer occupational scores were obtained from the O*NET database. Because these two need-reinforcers are highly correlated across O*NET occupations ($r = .85$), a composite need-reinforcer variable was constructed by calculating the mean of the Social Status and Recognition scores.

The mean annual salary (MAS) of each occupation was obtained from the Dictionary of Holland Occupational Codes (Gottfredson & Holland, 1989). Deng, Armstrong, and Rounds (2007) used a principle components analysis to create the composite variable to represent prestige. Only the first component had an eigenvalue larger than one, accounting for 79.05% of the total variance, indicating that the three

variables are highly related. The composite variable will be calculated with the following formula: $Prestige = 0.37 * z\text{-SVP} + 0.37 * z\text{-MAS} + 0.38 * z\text{-Reinforcer}$.

Occupational Interest Profiles. After a participant's expressed career choice was linked with an O*NET-SOC occupation, vocational interest data for that occupation was accessed. Holland's RIASEC model of interests was used to develop occupational interest profiles (OIP) for each occupation in the O*NET database. These OIPs were developed through a judgment method in which trained judges considered a description of each occupation and selected the most appropriate RIASEC ordering for each. This method was chosen over other classification methods because it proved to be the most reliable, valid, and practical (Rounds, Smith, Hubert, Lewis, & Rivkin, 1999). The ensuing interest profile consisted of six scores describing the occupation according to each of Holland's (1997) model of work environments. Interest profiles from the current version of O*NET were used because interest profiles available from the 1980s only consist of the top three codes in rank order, which does not provide the information necessary to calculate Things/People and Data/Idea dimension scores. It is believed that this will not have altered the results of the analyses because the profiles were assessed for stability, not for actual levels.

A limitation of the present study concerns the coding system developed by the original researchers. Some of the categories for coding current occupational aspiration and ideal occupational aspirations include two occupations, an example being the category of accountant/actuary. Another issue is that for some of the occupations O*NET lists multiple occupations that fall within that category, for example the occupations of sales managers, sales representatives, and sales agents could all fall within the category

of Business Sales. The limitation was dealt with through the computation of a composite score for each of the variables. Within the O*NET database numerical values are available for recognition, social status, and interest variables. Within the Dictionary of Holland Occupational Codes specific vocational preparation, sex type, and mean annual salary are already in numerical form. The value for each variable was averaged between the two or more occupations, creating a composite score. This composite score was then used in all subsequent analyses. For an example of this process for interests see Appendix 1.

Data for all variables were not available for every occupation, in which case that occupation was dropped from the composite score for that group. Data were not available at times because an adequate match to the original category could not be found in O*NET, such as the categories of homemaker, other, no work, and military service. Another situation where sufficient information was lacking was when an adequate match could not be made between the O*NET occupational titles listed for a category in the DHOC. Some examples are multi-media artists and animators, industrial safety and health engineers, and geological sample test technicians. In other cases some occupations that are listed together in O*NET were listed separately in the DHOC, for example biochemists and biophysicists are one group in O*NET but are listed separately in the DHOC. When this situation occurred, the same O*NET data was used for each of the occupations, but their individual DHOC data was used. A final situation that created a lack of information involved the information available in the DHOC. O*NET occupations were first matched in the DHOC in an alphabetized section that provided three letter Holland codes that was used to more efficiently search for the SVP, MAS,

and percent of females in the occupation information. SVP data was available in a separate section of the DHOC than the sex type and MAS information, and not all occupations were included in the section with sex type and MAS data.

Sufficient information was not available for the categories of homemaker, interpreter, lab technician, military service, skilled trades, other health, other, no work, fantasy, and non-business consultant; analyses were not conducted for participants who expressed these occupations as their occupational aspirations or their idealistic aspiration. However, it is unlikely the missing data affected the results of the analyses because not a single individual in the sample listed any of these categories as their occupational aspiration, and only 8.36 percent of women and 14.7 percent of men listed these categories as their idealistic aspiration.

Data/Ideas and Things/People Dimension Scores. The next step in the data analysis process was to calculate Data/Ideas and Things/People dimension scores for each expressed career choice as well as each ideal occupation if listed. Prediger (1982) reports formulas for each of these calculations. Data/Ideas dimension scores can be calculated as follows: $\text{Data/Ideas} = 0(R) - 1.7(I) - 1.7(A) + 0(S) + 1.7(E) + 1.7(C)$, or more simply $\text{Data/Ideas} = 1.7(E + C - I - A)$. A high score on the Data/Ideas dimension indicates a preference for working with data rather than ideas. Things/People dimension scores can be calculated as follows: $\text{Things/People} = 2(R) + 1(I) - 1(A) - 2(S) - 1(E) + 1(C)$, or $\text{Things/People} = 2(R-S) + I + C - A - E$. A high score on the Things/People dimension indicates a preference for working with things over people.

Statistical Analyses. Multiple regression analyses will be run to test the order of compromise predicted by Gottfredson (1981), as specified in hypotheses one and two,

while controlling for the non-independence of sex type, prestige, and interests using the model illustrated in Figure 4. Analyses will be performed using sex type, prestige, Things/People dimension, and Data/Ideas dimension scores for expressed occupational aspirations at Time 1 to predict idealistic aspiration for the same variable at Time 2. When more than two time points are available the model will be repeated from Time 2 to Time 3. For participants with data available at multiple time points, it should be possible to also evaluate the long-term stability of aspirations with a model including paths for time one predicting time two, time two predicting time three, and time one predicting time three. The partial correlations for each model will be standardized using Cohen's D in order to facilitate comparison between variables (Cohen, 1992).

To assess hypothesized gender differences in Data/Ideas and Things/People dimension scores, a repeated measures ANOVA model will be used to test for significant differences in means scores for men and women. Finally, to evaluate hypothesis five, multiple regression analyses will again be used to assess the stability of Data/Ideas and Things/People dimension scores. Scores from expressed aspiration will be used to predict scores for idealistic aspirations if an idealistic aspiration is listed. Scores at different time points will also be used to predict scores at a later time point. The analyses will also be re-run controlling for sex type to determine if a difference in stability of the two dimensions is accounted for by sex type.

All analyses will also be re-run for men and women separately to assess for a difference in stability for different aspects of the compromise process. To test the hypotheses, stability of the study variables for occupational aspirations over a one year period were assessed, as well as the order of compromise from idealistic aspiration to

occupational aspiration when compromise was reported. Multiple regression analyses were run to test the stability of sex type, prestige, and interests in order to control for the non-independence of the variables.

A bootstrap procedure (Efron & Tibshirani, 1993) was then used to empirically generate distributions for the partial correlations produced by the regression analysis. The first step in the bootstrap method was to create 1,000 bootstrap samples from the original data set through random sampling with replacement; a point estimate and standard error were then calculated for each partial correlation. These results were used to compute 95% confidence intervals through the percentile method (Mooney & Duval, 1993), significance at the .05 level is indicated if the 95% confidence interval does not include zero. Differences between stability of the variables were significant at the .05 if the 95% confidence intervals did not overlap.

Chapter 4: Results

Evaluation of Participant Attrition

A comparison of participants who remained in the study with participants who dropped out of the study after time one revealed few differences between the two groups. Participants who dropped out of the study were older ($M = 19.79$, $SD = 1.97$) than participants who remained in the study ($M = 19.13$, $SD = 1.41$), $t(5411) = 13.99$, $p < .001$. A difference was also found on the prestige dimension of occupational aspiration at year one, with participants who remained in the study expressing aspirations with higher prestige ($M = .47$, $SD = .77$) than the aspirations of participants who dropped out of the study ($M = .40$, $SD = .78$), $t(5814) = -3.428$, $p < .01$.

A comparison of men and women in the sample also revealed some differences. A higher percentage of men dropped out of the study after time one (66.2%) than women (51.7%), $\chi^2_{(1)} = 67.418$, $p < .001$. Women reported occupational aspirations at time one ($M = 25.84$, $SD = 16.830$ and time two ($M = 25.60$, $SD = 16.29$) that were more feminine sex typed than men's reported occupational aspirations at time one ($M = 22.30$, $SD = 12.92$) and time two ($M = 22.02$, $SD = 12.25$), $t(2672) = -3.62$, $p < .001$, $t(2672) = -3.795$, $p < .001$. Another difference found between men and women with time one and time two data was that men scored higher on the Data/Ideas dimension of interests for their occupational aspiration at time one ($M = .7144$, $SD = 6.91$) and at time two ($M = 1.12$, $SD = 6.66$), $t(2672) = 4.239$, $p < .001$, $t(2672) = 5.193$, $p < .001$. Based on the differences found between men and women, all analyses were run separately by gender.

Overall Stability of Expressed Career Choices

Following Gottfredson's predictions of order of compromise, it was predicted that sex type would be the most stable component of occupations, followed by prestige as second most stable, and then by interests as the least stable component. Table 1 presents the zero-order and partial correlations for the one-year stability of expressed career choices of students measured by sex type, prestige, and the two interest dimensions. Overall for women with year one and year two data, sex type was the least stable, $r = .36$, $SE = .028$, $CI = .31, .42$. Prestige, Things/People, and Data/Ideas with relatively similar in stability, $r = .62$, $SE = .019$, $CI = .58, .65$, $r = .61$, $SE = .023$, $CI = .56, .65$, and $r = .58$, $SE = .020$, $CI = .54, .62$ respectively. Support was not found for the predicted order of stability, prestige and interests (Things/People and Data/Ideas) were approximately equal in stability, and were significantly more stable than sex type.

Results for men with year one and year two data followed a similar pattern, sex type was the least stable, $r = .43$, $SE = .075$, $CI = .28, .57$, and prestige, Things/People, and Data/Ideas were relatively similar in stability, $r = .64$, $SE = .047$, $CI = .55, .74$, $r = .63$, $SE = .066$, $CI = .50, .75$, and $r = .64$, $SE = .045$, $CI = .54, .72$ respectively. The pattern of stability for occupational aspirations from year one to year two again did not support the order predicted by Gottfredson's theory. Sex type was the least stable component, with prestige and interests (Things/People and D/) being similar in level of stability.

Changes in Expressed Career Choices

However, the pattern of stability changed when looking only at participants who changed their expressed occupational aspiration from year one to year two. Table 2 presents the zero-order and partial correlations for the year one and year two expressed

career choices of those students who changed their career aspirations in a one-year period, as measured by sex type, prestige, and the two interest dimensions. For women, sex type was no longer significantly stable, $r = .05$, $SE = .035$, $CI = -.01, .12$, and Data/Ideas just reached significance, $r = .08$, $SE = .032$, $CI = .02, .15$. Prestige and Things/People were significantly stable, $r = .34$, $SE = .032$, $CI = .27, .40$, and $r = .31$, $SE = .036$, $CI = .24, .38$, and were not significantly different from each other. Prestige and Things/People were both stable and approximately equal in stability, followed by sex type and Data/Ideas with equivalent stability though they were not significantly stable over time. Again this pattern does not follow Gottfredson's prediction; sex type is again one of the least stable components rather than the most stable. Gottfredson predicts that interests will be compromised before prestige, and while for these participants prestige is more stable than the Data/Ideas dimension of interests as expected, it is equivalent in stability with the Things/People dimension of interests.

For men, sex type was also no longer significantly stable, $r = -.05$, $SE = .101$, $CI = -.25, .15$, nor was Data/Ideas, $r = .07$, $SE = .088$, $CI = -.10, .24$. Prestige and Things/People were significantly stable, $r = .39$, $SE = .082$, $CI = .28, .54$, and $r = .27$, $SE = .114$, $CI = .05, .50$ and were not significantly different. While the pattern of stability differed for participants who changed their occupational aspiration from year one to year two, patterns still did not support the order of stability predicted by Gottfredson. Prestige was the most stable component, and is nearly significantly more stable than Things/People. Sex type and Data/Ideas are approximately equal in their lack of stability and are significantly less stable than prestige, though not significantly less stable than Things/People.

Self-Reported Career Compromises

Multiple regression analyses were again used to test Gottfredson's (1981) predictions that interests would be compromised first, followed by prestige, and that sex type would be compromised last, as well as the hypothesis that scores on the Things/People dimension would be more stable than scores on the Data/Ideas dimension. Table 3 presents the zero-order and partial correlations for the idealized and compromised career choices of men and women who self-reported having made a career compromise, as measured by sex type, prestige, and the two interest dimensions.

For women who reported a compromise at year one, neither sex type, prestige, nor Data/Ideas were stable, $r = .04$, $SE = .035$, $CI = -.03, .11$, $r = .05$, $SE = .033$, $CI = -.02, .11$, and $r = .04$, $SE = .034$, $CI = -.03, .10$. Scores on Things/People were stable however, $r = .25$, $SE = .036$, $CI = .18, .32$. The same pattern was found for women who reported a compromise at year two, see Table 3. Overall order of stability did not follow predictions with sex type, prestige, and Data/Ideas having equivalent stability and a dimension of interests being the most stable component.

The pattern of stability differed somewhat for men. For men who reported a compromise at year one, neither sex type, Things/People, nor Data/Ideas were stable, $r = .09$, $SE = .077$, $CI = -.05, .24$, $r = .04$, $SE = .077$, $CI = -.11, .19$, and $r = .05$, $SE = .092$, $CI = -.14, .22$. Prestige was significantly stable, $r = -.17$, $SE = .075$, $CI = -.30, -.01$. For men, prestige was the only stable aspect of aspirations, with sex type and the two interest dimensions having equivalent stability. Analyses were not completed for men who reported compromise at year two due to the small sample size ($n=27$).

Gender Differences on the Things/People and Data/Ideas Dimensions

It was predicted that a significant mean difference in Things/People dimension scores would be found between men and women. Contrary to prediction, a repeated measures ANOVA model computed to test for differences in means scores for men and women on the Things/ People dimension was not significant for occupational aspiration at year one or year two, $F(1,2672) = .503, p = .478$, and $F(1, 2672) = .839, p = .360$, nor for idealistic aspiration at year one or year two, $F(1,571) = .411, p = .522$, and $F(1,146) = .997, p = .320$, means and standard deviations are provided in Table 5.

It was predicted that no difference would be found in Data/Ideas dimension scores for men and women. However, a repeated measures ANOVA model computed to test for differences in mean scores for men and women on the Data/Ideas dimension was significant for occupational aspiration at year one and year two, $F(1,2672) = 17.969, p < .001$, and $F(1, 2672) = 26.969, p < .001$, men scored more towards the data side of the dimension (Y1: $M = .714, SD = 6.91$, Y2: $M = 1.41, SD = 7.01$) than women (Y1: $M = -.957, SD = 6.59$, Y2: $M = -.661, SD = 6.66$, see Table 5). However, no significant difference was found for idealistic aspiration at year one or year two, $F(1,571) = 1.491, p = .223$, and $F(1, 146) = .393, p = .532$. It appears that men and women do not differ in their preference on the Data/Ideas dimension, but they do differ on this dimension for the occupations they are currently pursuing.

Sex Type as an Interest Dimension: Things/People versus Data/Ideas

In terms of stability on the Things/People and Data/Ideas dimension, it was predicted that scores on the Things/People dimension would be more stable than scores on the Data/Ideas dimension. For women, differences in stability of Things/People dimension scores and Data/Ideas dimension scores were in the predicted direction from

year one to year two for all participants (Things/People: $r = .61$, $SE = .023$, $CI = .56, .65$; Data/Ideas: $r = .58$, $SE = .020$, $CI = .54, .62$), from year one to year two for participants who changed their occupational aspiration (Things/People: $r = .31$, $SE = .036$, $CI = .24, .38$; Data/Ideas: $r = .08$, $SE = .032$, $CI = .02, .15$), for participants who reported compromise at year one (Things/People: $r = .25$, $SE = .036$, $CI = .18, .32$; Data/Ideas: $r = .04$, $SE = .034$, $CI = -.03, .10$), and for participants who reported compromise at year two (Things/People: $r = .28$, $SE = .109$, $CI = .07, .49$; Data/Ideas: $r = .21$, $SE = .097$, $CI = .01, .39$). While the difference in stability was in the expected direction for all four analyses, the difference was only significant for participants who changed their occupational aspiration from year one to year two and for those who reported compromise at year one, providing partial support for the hypothesis.

Results differed for men, differences in stability of Things/People dimension scores and Data/Ideas dimension scores were only in the predicted direction from year one to year two for participants who changed their occupational aspiration (Things/People: $r = .27$, $SE = .114$, $CI = .05, .50$; Data/Ideas: $r = .07$, $SE = .088$, $CI = -.10, .24$), but this difference was not significant. Men's scores on Things/People and Data/Ideas were approximately equivalent in stability from year one to year two for all participants (Things/People: $r = .63$, $SE = .066$, $CI = .50, .75$; Data/Ideas: $r = .64$, $SE = .045$, $CI = .54, .72$), as well as for participants who reported compromise at year one (Things/People: $r = .04$, $SE = .077$, $CI = -.11, .19$; Data/Ideas: $r = .05$, $SE = .092$, $CI = -.14, .22$). Support was not found for men in regards to the hypothesis of differences in stability on Things/People and Data/Ideas dimension scores.

Chapter 5. Discussion

The primary objective of the present study was to test the order of compromise predicted by Gottfredson while simultaneously assessing the concept of interests as a compound factor which incorporates sex type and prestige. Gottfredson's (1981) theory predicted that interests would be compromised first, followed by prestige, and finally by sex type. This would lead to sex type being the most stable component, with prestige being next most stable, and with interests being least stable. The primary difficulty in studying Gottfredson's theory of compromise is the non-independence of sex type, prestige, and interest within occupations. The present study addressed the issue by using multiple regression procedures to statistically control for this non-independence. As is demonstrated in the results, the magnitude of the correlations measuring career choice stability decreased after controlling for the confounding between Gottfredson's dimensions. This decrease demonstrates the success of multiple regression analyses in partially out the influence of the confounding variables by showing how much of each zero-order correlation is accounted for by the non-independence of the variables.

Stability of Aspirations and Career Compromises

Overall, support was not found for the predictions made in Gottfredson's (1981) theory regarding of the ordering of compromise across the dimensions of sex type, prestige, and interests. In terms of the basic order of compromise expected, with sex type predicted as most stable, followed by prestige, and lastly by interests, participants did not follow this pattern in any of the four analyses for either gender. When looking at all participants with year one and year two data, each of the four components were stable over the one year period. Prestige and interests (Things/People and Data/Ideas) were

approximately equal in stability, and were significantly more stable than sex type. In a sense this pattern is opposite of that predicted by Gottfredson, sex type is least stable rather than the most stable and prestige and interests are equally stable rather than prestige being more stable than interests. Because this analysis involved all participants, including those who did not change their occupational aspiration from year one to year two, substantial stability of all the occupational components was not surprising.

The stability of inventoried vocational interests has been shown in a meta-analysis conducted by Low, et al. (2005), and the results of the present study found similar stability for expressed vocational interests. The stability of expressed interests in this study was equivalent for women and men, $r = .71$, $SE = .018$, $CI = .67, .74$, and $r = .73$, $SE = .050$, $CI = .62, .82$ respectively for Things/People dimension. Stability for Data/Ideas dimension scores was also equivalent for women and men, $r = .66$, $SE = .017$, $CI = .63, .69$, and $r = .69$, $SE = .040$, $CI = .61, .77$ respectively. Comparatively, the stability of inventoried interests found for individuals age 18-21.9 years (mean age of participants in this sample was 19.13, $SD = 1.40$) in the Low et al. (2005) meta-analysis was $\rho = .67$, $CI = .66, .68$. The finding of equivalent stability of expressed interests as compared to inventoried interests provides additional support for the continuity of vocational interests over time, as well as providing evidence of the relative equivalence of stability in interests regardless of how interests are being measured.

However, it could be argued that Gottfredson's theory (1981) does not make predictions about stable career choices. Therefore, the more appropriate test of Gottfredson's theory would be to focus only on those individuals who either change their aspirations over time or who have reported making a compromise in their career choices.

When looking at participants who changed their occupational aspiration from year one to year two, prestige and Things/People were both stable and approximately equal in stability, and then sex type and Data/Ideas were approximately equal in stability, but were not significantly stable over time. Again this pattern does not follow Gottfredson's prediction; sex type is the least stable component rather than the most stable. Gottfredson predicts that prestige will be more stable than interests, and for these participants prestige is more stable than the Data/Ideas dimension of interests, but is equivalent in stability with the Things/People dimension of interests. Changes in occupational aspiration assessed with this analysis are not necessarily an indication of compromise, and therefore may have represented changes based on the normal developmental process of identity exploration and development that individuals are going through at this age. If this is the case, it would be natural for the pattern of stability to not follow Gottfredson's predictions as her predictions only apply to the compromise process.

Based on the possibility of normal developmental changes being picked up by the stability over a one year period analyses, patterns of stability when actual compromise is reported is much more telling in terms of Gottfredson's predictions. Patterns of stability differed for women and men when compromise was reported, therefore the results will be discussed separately here. When looking at women who report a compromise in their occupational aspiration, Things/People is the only stable aspect of their aspiration with Data/Ideas being somewhat stable at year two. When compromising, sex type, prestige, and Data/Ideas are approximately equal in stability, but are not stable over time. Again the pattern of stability does not come close to approximating the order predicted by

Gottfredson; a dimension of interests is the most stable, and prestige and sex type are both less stable.

Prestige was the most stable component for men who reported a compromise at year one, as well as being the only stable component. Sex type, Things/People, and Data/Ideas were not stable and were approximately equal in stability. Gottfredson's predicted order is again not followed. The interesting finding that emerged from this analysis is the negative partial correlation between men's idealistic aspiration and their occupational aspiration for prestige. An examination of the means reveals that the prestige of men's idealistic aspirations ($M = -.03$, $SD = .69$) was actually lower than that of their occupational aspiration ($M = .49$, $SD = .69$).

People-Things as a Gendered Dimension

The second approach this study took to addressing the non-independence of sex type, prestige, and interests was to assess the concept of interests as a compound factor which incorporates sex type and prestige. The interest component of each occupation was divided into the Data/Ideas dimension and the Things/People dimension. As the Things/People dimension has found to be a gendered dimension (Lippa, 1998), it followed from Gottfredson's theory that the gendered dimension of interests should be more stable than the non-gendered dimension of interest. In each of the four analyses run in this study, stability over a one year period, change over a one year period, and compromise at year one and at year two, women's scores on the Things/People dimension were more stable than scores on the Data/Ideas dimension as predicted. This difference was significant in two of the cases, providing partial support for this alternative conceptualization of Gottfredson's prediction of the order of compromise.

Women were more likely to compromise on the non-gendered component of interests and more likely to protect the gendered dimension.

Turning to the stability of men's scores on the Things/People and Data/Ideas dimension, it was again predicted that scores would be more stable on the Things/People dimension than on the Data/Ideas dimension. In the three analyses run for men, stability over a one year period, change over a one year period, and compromise at year one, a significant difference in stability on the Things/People and Data/Ideas dimension was not found. Men were not more likely to compromise on the Data/Ideas dimension than on the Things/People dimension as predicted.

For both men and women, sex type was repeatedly found to be the least stable component of an occupation, opposite of Gottfredson's prediction. Many other researchers using a variety of methods have found a similar pattern of sex type playing a much less important role than expected (Davidson, 1986; Leung & Plake, 1990; Hesketh, Elmslie & Kaldor, 1990; Hesketh, Durant & Pryor, 1990). Sex type has often been measured as the percentage of women in an occupation, but earlier studies often then categorized occupations as female, neutral, or male sex typed. The present study used sex type as a continuous variable which allowed for more precise measurement of differences in sex type between occupations. Despite this improvement in the measurement of sex type, support for importance of this construct in the compromise process was not found. Although the sex type of occupations has traditionally been measured using the proportion of women employed, the current findings may reflect that sex type preferences become embedded in the Things/People dimension of interest. This interpretation is consistent with Lipka's (1998) work on the gendered nature of interest preferences along

the Things/People dimension, and because of this the number of men and women employed in an occupation may be less salient to individuals making career choices than are their gender-based preferences for work along the Things/People dimension.

Gottfredson also predicts that prestige will be more protected than interests and therefore more stable, but this difference was not always supported. Prestige and interests were found to be equivalent in stability for women over a one year period for all participants and for those who changed occupational aspirations from year one to year two, and when compromise was reported prestige was actually found to be less stable than the Things/People dimension of interests for women. Pryor and Taylor (1986) also found that prestige was sacrificed to maintain interests, and Hesketh, Elmslie & Kaldor (1990) and Hesketh, Durant & Pryor (1990) both found that interests were more important than prestige in their studies. Considerable evidence contradicting the order of compromise as predicted by Gottfredson has begun to accumulate.

Gottfredson's theory assumes that valid distinctions can be made between sex type, prestige, and interest, but researchers of the theory quickly came to recognize that sex type, prestige, and interests are confounded in such a way as to prevent these distinctions from being made. Some studies have attempted to account for the non-independence of sex type, prestige, and interests to varying degrees of success, and these studies have reported mixed results, some partially supporting Gottfredson's order of compromise while others did not find any support for the predicted order. However, the addition of the results from this study where the non-independence was successfully controlled for adds weight to the lack of support for Gottfredson's predicted order of compromise.

The second component of the present study attempted to assess the concept of interests as a compound factor which incorporates sex type and prestige. As early as 1990, Hesketh and colleagues began to test an alternative account of compromise put forth by Elmslie (1988) that modified Gottfredson's original theory. This alternative account argued that researchers need to abandon the assumption that components incorporated earlier into the self-concept are the most important to a person who is making a career decision. Alternatively, career circumscription was argued as a cumulative process that incorporates earlier experiences. This cumulative process would explain the non-independence between sex type, prestige, and interests, as factors that influence career choice at a later stage such as interests incorporates the earlier influences such as sex type and prestige. Based on this alternative account of the compromise process, it was predicted that Things/People, the sex typed dimension of interests, would be more stable than the non-sex typed dimension of interests. For women this difference in stability was in the expected direction for all four analyses conducted and was significant for two of the analyses. The finding that the gendered dimension of interests is more stable and protected than the non-gendered dimension of interest, as well as the finding that sex type when measured independently is not stable, provides partial support for the alternative account of compromise that sex type becomes embedded in the Things/People dimension of interests.

Patterns of stability for men also failed to support the order of compromise predicted by Gottfredson, though in a different pattern than was found for women. Based on the nature of the original data collection, the sample size for women greatly exceeded the sample size for men. This leads to a greater degree of confidence being put in the

results for women than for men. Standard errors associated with the partial correlations for men tended to be higher than the standard errors for the women's sample. This difference influenced the results found, increasing the width of the confidence intervals around the partial correlations and decreasing the number of significant results found. However, the differing patterns of stability between men and women is still deserving of a closer look. Sex type played a much less important role than expected for the men as it did for the women, whereas prestige played a much more important role in men's career choices and compromises than expected.

When men reported compromise, prestige was the only stable component of their occupational choice, whereas the Things/People dimension was the only stable component for women. No difference in the pattern of stability was predicted between men and women, yet is not surprising when compared to the results of other research. Hesketh, Hesketh, Hansen, and Goranson (1995) conducted a study to develop new sex type, prestige, and Holland interest scales from the Occupational scales of the Strong Interest Inventory. The authors sought to provide a basis for understanding the influence of sex type and prestige on interests and hence preferences. Through the development of the new scales the authors confirmed that preferences expressed in terms of interests are not immune to the influence of sex type and prestige, and found that these influences are not identical among men and women.

Interest researchers have also begun to examine the influence of prestige and sex type on interests. As described earlier, Tracey and Rounds (1996) identified prestige as a third dimension of interests, indicating that respondents were using prestige in their evaluation of occupational preferences. In their assessment of the structure of interests,

Einarsdottir and Rounds (2000) supported the existence of a third dimension of interests with an alternate method, showing that this finding is not method bound. Acknowledging the confounding between sex type and prestige, Einarsdottir and Rounds also sought to determine whether the third dimension underlying interests may reflect sex type as well as prestige, and stated that sex type and prestige were unlikely to be detected as separate dimensions because of their confounded nature. Einarsdottir and Rounds found that both sex type and prestige did account for a proportion variance in the third dimension, but partially based on Gottfredson's theory which states that sex type is more important than prestige they named the third dimension sex type rather than prestige as Tracey and Rounds (1996) did.

As it appears that the relation of sex type and prestige with interests may not be the same for men and women (Hesketh et al., 1995) and the fact that there is a debate over whether the third dimension of interests represents sex type or prestige, it is possible that the third dimension represents prestige for men and sex type for women. When compromise was reported, prestige was the only stable component for men, and the sex typed dimension of interests (Things/People) was the only stable dimension for women. While this difference may be an artifact of the differing sample sizes for men and women, it is also possible that a true difference exists. This possibility should be further explored in future research.

Implications for Revising Gottfredson's Theory

Gottfredson's (1981) theory of circumscription and compromise is one of the few theories developed that tries to explain the influences of prestige, sex type, and interests on occupational preferences and should be commended for this. However, because the

theory doesn't account for the non-independence of sex type, prestige, and interests it is not a very useful theory. Based on the results of the present and past studies, it is recommended that the research focus move towards conceptualizing interests as a compound construct that incorporates sex type and prestige like the research conducted by Hesketh and colleagues as well as the research being conducted on the structure on interests conducted by Rounds and colleagues.

A large aspect of the present study that cannot be ignored is the uniqueness of the sample used, which may limit the generalizability of the current findings and also limit the extent to which these results may contribute to revising Gottfredson's theory. The parents of the participants were highly educated, with over half of the fathers and over a quarter of the mothers having graduate degrees. This level of education is high even compared to the educational levels today. Another factor that makes this sample unique is the highly selective nature of the schools the participants attended. Based on the background of the participants, it is possible that there is a restricted range of prestige preference in this sample. The most frequently reported occupational aspiration for both men and women was physician, with 17.4 percent of women and 19.7 percent of men expressing this as their occupational aspiration. Physician has a prestige rating of 1.54; the range of prestige scores was -2.376 to 2.109. The only occupations reported from this sample with higher prestige ratings were other medical occupations such as academic medicine, internal medicine, and other physician, which 7.0 percent of women and 6.0 percent of women expressed as their occupational aspiration.

With the unique educational background of this sample, the highly selective schools the participants attended, and the prestige level of the participants' most

frequently reported occupational aspirations, it appears that prestige may be more important for this sample than it would be for a more representative sample. If prestige is more important for this sample, that could explain why prestige and the sex typed gender difference were often equivalent in stability and why prestige was actually most stable for men who reported compromise. Additionally, it was found that participant's occupational aspiration had a higher prestige rating than their idealistic or preferred aspiration, this was true for both men and women. It would seem that while the participants actually preferred a lower prestige occupation, they were pursuing a more prestigious occupation. It is possible that participants were experiencing external pressure to choose prestigious occupations. This pressure could be coming from their parents, or it could simply have come from the expectations associated with attending universities such as Harvard and Vassar.

When participants reported a compromise, they were asked to give the reasons the compromise was necessary. The most frequent reason for both men and women was financial problems; 56 percent of women and 55 percent of men chose this as a reason for their compromise. More prestigious occupations are generally associated with a higher income, which may have been needed to pay off the expense of an education at an elite university. The second most frequent response for both men and women was family pressure; 34.41 percent of women and 48.57 percent of men expressed that this was a reason for their compromise.

The increased focus on prestige found with the participants in this study could explain why the expected gender difference along the Things/People dimension was not found. As described previously, prestige and interests are confounded. Realistic interests,

the things side of the Things/People dimension, are associated with mostly moderate and low prestige occupations. On the other hand, Social interests, the people side of the Things/People dimension are associated with mostly moderate prestige occupations. A stronger focus on prestige may have led the confounding of prestige and interests to mask the gender difference expected on the Things/People dimension. Males in particular seemed to maintain prestige over interests, which may have led them away from the gender traditional side of the dimension.

While it is possible that prestige is more important to the sample of participants in this study, it is also possible that prestige simply plays a more important role in the compromise process than predicted by Gottfredson. Taylor and Pryor (1985) findings suggested that prestige may moderate the relationship between interests and course choice in that if people do not choose courses that are congruent with their interests, they will tend to make choices on the basis of prestige. Blanchard and Lichtenberg (2003) conducted a study of compromise that addressed the conditional priorities that Gottfredson added to her theory in 1996. Gottfredson (1996) predicted that in a major compromise situation in which participants are choosing among unacceptable alternatives participants would choose occupations that first satisfied their sex type, followed by prestige, followed by interests, the same order as the original theory puts forth. However, Blanchard and Lichtenberg found only partial support for this hypothesis; sex type and prestige were rated the same by participants rather than sex type being rated higher as predicted. Blanchard and Lichtenberg (2003) then stated that Gottfredson's theory may underestimate the impact that prestige has on the career decision making process. Similar to the pattern found in the present study, Armstrong and Crombie (2000) found that some

participants expressed expectations that were higher in prestige than their aspirations. Many studies have found prestige to be more important to the compromise process than predicted by Gottfredson, therefore this result may not be unique to the sample used in the present study but instead represent an actual difference in the importance of prestige.

Limitations and Future Directions

One potential limitation of the current findings is the fact that the women in this sample are attending prestigious post-secondary institutions, tend to come from advantaged backgrounds, and may be less gender traditional than women in a representative sample. The women in this sample all attended one of the Seven Sisters schools, a consortium of prestigious East Coast liberal arts colleges for women and the female equivalent of the once predominantly male Ivy League school.

The Seven Sisters schools were founded to provide educational opportunities to women equal to those available to men in a time when some would confine women to the kitchen and the nursery, in fact suffrage was not gained for nearly a century after the 1837 founding of Mount Holyoke, the first of the Seven Sisters Schools. The ideological challenges of founding schools for women were great as the prevailing thought held that women were constitutionally unfit to withstand the mental and physical demands of higher education. (Mount Holyoke Office of Communications, 2006). While the climate of 1981 differed greatly from that of 1837, the rights of women were still a major issue in the 1960s, 70s, and 80s. The “second-wave” of feminism focused on the unofficial inequalities that still existed after the first wave of feminism.

Around the time of the data collection for the present study, many women’s colleges such as those sampled in this study were debating the possibility of becoming

co-educational. Many schools, such as Smith, decided to remain women's colleges. In its description of why it remains a women's college, Smith expresses that they are convinced that remaining a women's college is a good choice that offers special bonuses to its students. Smith reports that having a wide variety of role models tends to boost the aspirations and career achievements of female college students. They also state that Smith provides an atmosphere in which there are no stereotypes about what women can do, but instead has unlimited expectations about what women can do (Smith College, 2006). The beliefs and missions of the schools attended by the study's participants along with the education level of their parents may have impacted the women's beliefs regarding gender traditionality and the importance of prestige. The women in the sample being less gender traditional could have affected the results of the study by restricting the range of sex type, prestige, and interests that would be found in a representative sample.

The unique aspects of the sample as discussed above limits the generalizability of the findings of this study. Another aspect of the study that limits the generalizability of the findings is the time in which the data was collected, 1981-1982. Twenty six years have passed since data collection, and it is possible that the importance of the different occupational components has changed over the years and that a different pattern of stability would emerge with a modern day sample.

Another limitation of the present study is the categorization system developed with the original data collection. Participants' occupational aspirations and idealistic aspirations were categorized into one of seventy two categories. Some of the categories consisted of two occupational titles, the titles were conceptually related, but this does not mean that each occupation would have the same sex type, prestige, or interest rating. For

example, the accounting/actuary was one category; accounting had a sex type rating of 38, whereas actuary had a sex type rating of 26. For the purposes of this study the sex type ratings were averaged to create a composite sex type rating, but results may have differed if the original sex type rating was used rather than the composite rating. A replication of this study would allow for ratings to be assigned to individual occupations that are expressed rather than being limited to 72 categories.

Different sources were used in order to obtain the various ratings used in this study. One resource was the Dictionary of Holland Occupational Titles (Gottfredson & Holland, 1989). The use of the DHOC was necessary in order to obtain ratings of sex type, mean annual salary, and specific vocational preparation needed as these variables likely have changed drastically in the past 26 years. However, the number of occupational titles has been expanded considerably since the DHOC in 1989, resulting in the inability to obtain data for all variables for all occupations determined to fall within one of the original occupational categories. This complication resulted in incomplete data for some categories which were subsequently removed from the analyses. Ten of the original categories had incomplete data and were not used in the analyses. Many of these categories had few participants who listed that category as their occupational aspiration such as the categories of homemaker with only ten participants listing this category, but more participants listed other categories that had incomplete data such as the other health category with 78 participants. It is uncertain how the inclusion of the missing categories may have impacted the findings of the study.

As mentioned earlier, it is recommended that future research into the compromise process should move towards conceptualizing interests as a compound construct that

incorporates sex type and prestige. Because the order of compromise differed for the men and the women in this sample, it is also recommended that the compromise process be investigated for men and women separately to continue exploring the differing importance of the various components for men and women. A great deal of previous research relies about simulated compromise conditions with forced choice stimuli that provide an artificial view of the compromise process. Future research should continue to assess actual compromises as was done in the present study to gain a better understanding of which occupational components are truly most important to individuals when they are forced to relinquish their idealistic aspirations.

Implications for Counseling Practice

Several implications for counselors and other professionals may be derived from the results of this study. First, it may be important for professionals assisting individuals with their career choices to not only assess the individual's interests, but also their sex type and prestige preferences. Hesketh et al. (1995) conducted a study to develop sex type and prestige scales from the Strong Interest Inventory, and scales such as this could make the process of assessing sex type and prestige preferences easier for individuals involved in career counseling. Beyond simply assessing for the individuals preferences, clients would likely benefit from exploration and greater understanding of how sex type and prestige influence their interest preferences. Occupational alternatives disregarded early in the circumscription process due to sex type and prestige levels that may actually may be a good fit with a client's interests represents an undue restriction of the client's zone of acceptable alternatives. Identification of what types of occupations may have

been prematurely disregarded and encouragement to further explore these alternatives would greatly benefit clients.

Circumscription due to sex type level may be particularly likely to be unconscious due to how early in the circumscription process it forms; therefore exploration of sex type preference may be particularly helpful. Exploration of circumscription due to sex type may be especially important in terms of increasing non-traditional career choices. For example, Shinar (1975) found that engineering was judged as a highly masculine occupation, therefore a female may disregard this area of work from an early age, when in fact it would be a good fit with her Realistic and Investigative interests. A great deal of focus has recently been turned towards encouraging women to pursue careers in science, technology, engineering, and math (STEM) fields, in fact programs have been developed at many universities to do just this. A greater understanding of how early messages regarding the appropriateness of certain occupations for males and females becomes incorporated into interests could assist in this process.

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Table 1*Stability of Expressed Career Choices Over a One-Year Period*

Measure	Zero-order Correlation			Partial Correlation		
	<i>r</i>	<i>SE</i>	<i>CI</i>	<i>r</i>	<i>SE</i>	<i>CI</i>
Female						
Sex type	.64	.020	.60, .68	.36	.028	.31, .42
Prestige	.75	.014	.72, .78	.62	.019	.58, .65
Things/People	.71	.018	.67, .74	.61	.023	.56, .65
Data/Ideas	.66	.017	.63, .69	.58	.020	.54, .62
Male						
Sex type	.61	.060	.49, .72	.43	.075	.28, .57
Prestige	.74	.039	.66, .81	.64	.047	.55, .74
Things/People	.73	.050	.62, .82	.63	.066	.50, .75
Data/Ideas	.69	.040	.61, .77	.64	.045	.54, .72

Note. N = 2353 female and 321 male college students who reported career choices in year 1 and year 2. *SE* = standard error from bootstrapping analysis, *CI* = 95% confidence interval.

Table 2*Changes in Expressed Career Choices Over a One-Year Period*

Measure	Zero-order Correlation			Partial Correlation		
	<i>r</i>	<i>SE</i>	<i>CI</i>	<i>r</i>	<i>SE</i>	<i>CI</i>
Female						
Sex type	.28	.034	.21, .35	.05	.035	-.01, .12
Prestige	.45	.029	.39, .50	.34	.032	.27, .40
Things/People	.38	.033	.31, .44	.31	.036	.24, .38
Data/Ideas	.15	.033	.08, .21	.08	.032	.02, .15
Male						
Sex type	.09	.087	-.07, .26	-.05	.101	-.25, .15
Prestige	.44	.077	.29, .58	.39	.082	.28, .54
Things/People	.36	.100	.16, .55	.27	.114	.05, .50
Data/Ideas	.03	.092	-.14, .22	.07	.088	-.10, .24

Note. N = 984 female and 114 male college students who reported having different career choices in year 1 and year 2. *SE* = standard error from bootstrapping analysis, *CI* = 95% confidence interval.

Table 3

*Self-Reported Career Compromises at Year One: Sex type, Prestige, and Interest
Similarity of Aspirations and Current Career Choices*

Measure	Zero-order Correlation			Partial Correlation		
	<i>r</i>	SE	CI	<i>r</i>	SE	CI
Female						
Sex type	.03	.037	-.04, .10	.04	.035	-.03, .11
Prestige	.04	.033	-.03, .10	.05	.033	-.02, .11
Things/People	.28	.035	.21, .35	.25	.036	.18, .32
Data/Ideas	.09	.039	.02, .16	.04	.034	-.03, .10
Male						
Sex type	.17	.070	.03, .31	.09	.077	-.05, .24
Prestige	.07	.071	-.06, .21	-.17	.075	-.30, -.01
Things/People	.02	.077	-.13, .18	.04	.077	-.11, .19
Data/Ideas	.11	.084	-.05, .29	.05	.092	-.14, .22

Note. N = 866 female and 140 male college students who reported having different career aspirations from their current career choice in year 1. *SE* = standard error from bootstrapping analysis, *CI* = 95% confidence interval.

Table 4

Women's Self-Reported Career Compromises at Year Two: Sex type, Prestige, and Interest Similarity of Aspirations and Current Career Choices

Measure	Zero-order Correlation			Partial Correlation		
	<i>r</i>	SE	CI	<i>r</i>	SE	CI
Sex type	-.06	.082	-.22, .11	.07	.070	-.07, .20
Prestige	-.05	.093	-.23, .14	-.05	.081	-.21, .11
Things/People	.32	.088	.15, .49	.28	.109	.07, .49
Data/Ideas	.20	.098	.00, .38	.21	.097	.01, .39

Note. N = 131 female college students who reported having different career choices in year 1 and year 2. Male students (n = 27) were not included in this analyses due to the small sample size.

SE = standard error from bootstrapping analysis, *CI* = 95% confidence interval.

Table 5*Table of Means and Standard Deviations for Things/People and Data/Ideas Measures*

Measure	Things/People		Data/Ideas	
	M	SD	M	SD
Female				
Y1 Occupational Aspiration	-0.62	4.99	-0.96	6.59
Y1 Idealistic Aspiration	-1.76	5.24	-3.42	4.98
Y2 Occupational Aspiration	-0.75	4.91	-0.66	6.66
Y2 Idealistic Aspiration	-1.69	5.17	-3.16	4.87
Male				
Y1 Occupational Aspiration	-0.41	4.87	0.71	6.91
Y1 Idealistic Aspiration	-2.17	4.99	-2.67	5.55
Y2 Occupational Aspiration	-0.48	5.04	1.41	7.01
Y2 Idealistic Aspiration	-2.76	4.28	-3.80	4.27

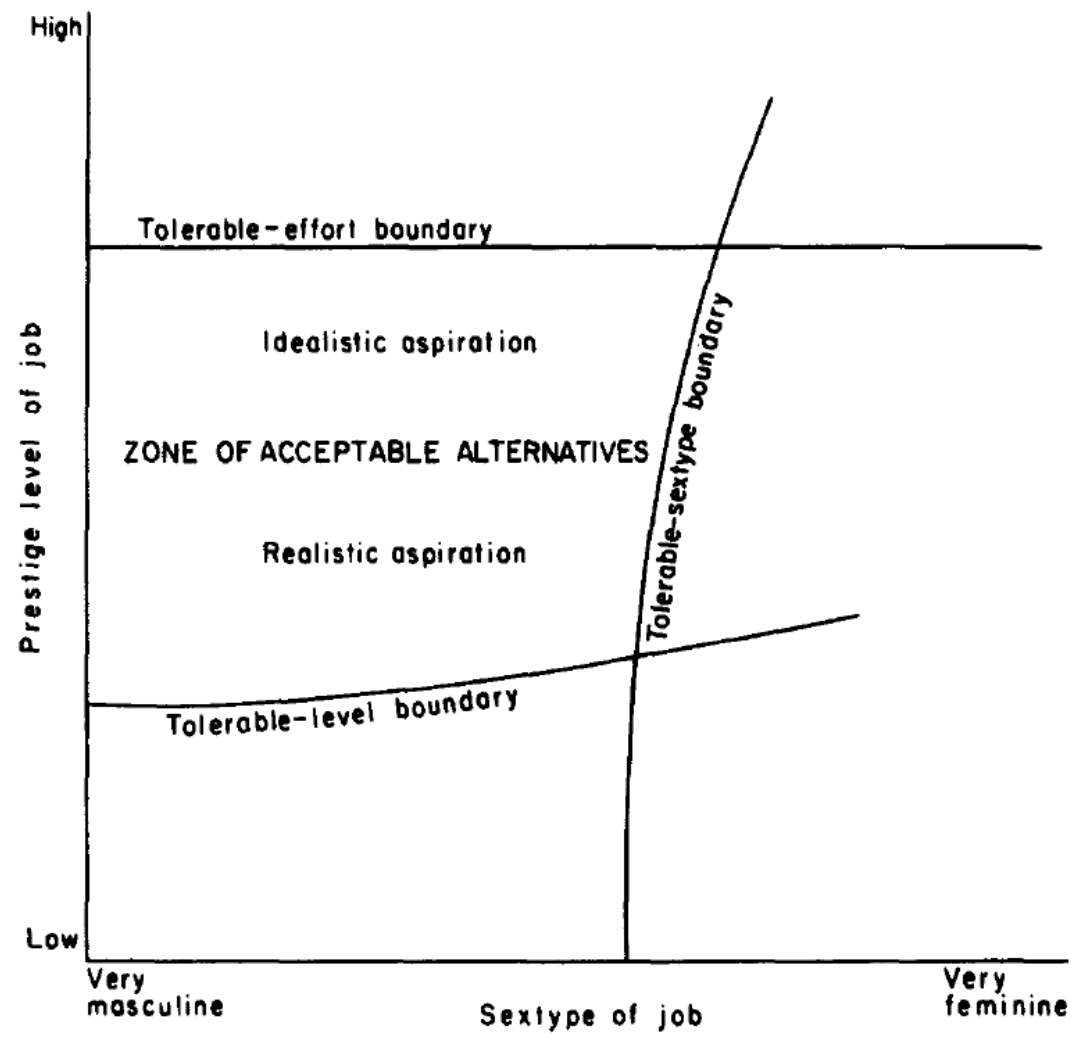


Figure 1. Example of a hypothetical average intelligence, middle-class boy's zone of acceptable alternatives (social space) based on the circumscription of occupational aspirations according to his perceptions of job-self compatibility.

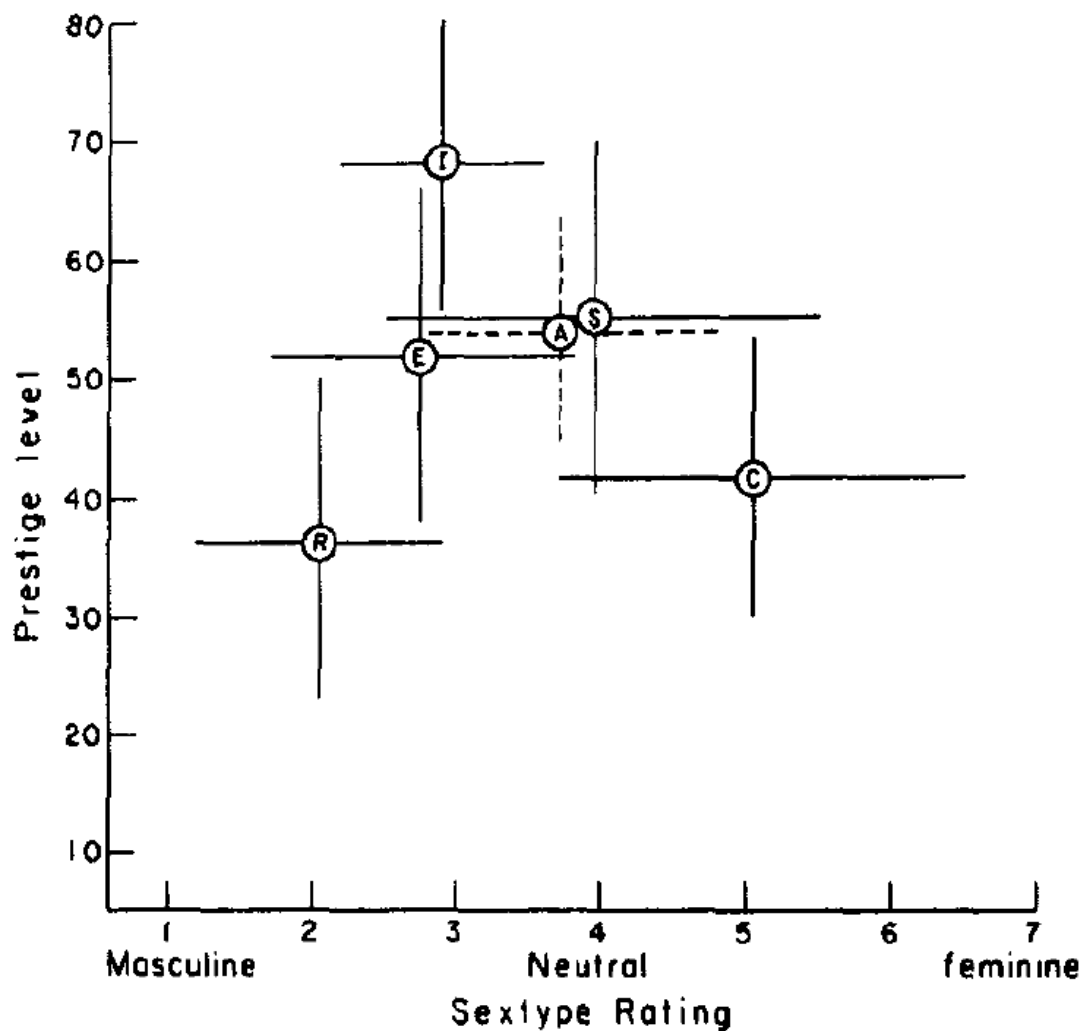


Figure 2. Prestige and sex type ratings of occupations in the different Holland fields of work. (Each field designated by a cross centered at the mean for prestige and sex type and showing one standard deviation on either side of the mean. R = Realistic, I = Investigative, A = Artistic, S = Social, E = Enterprising, C = Conventional.)

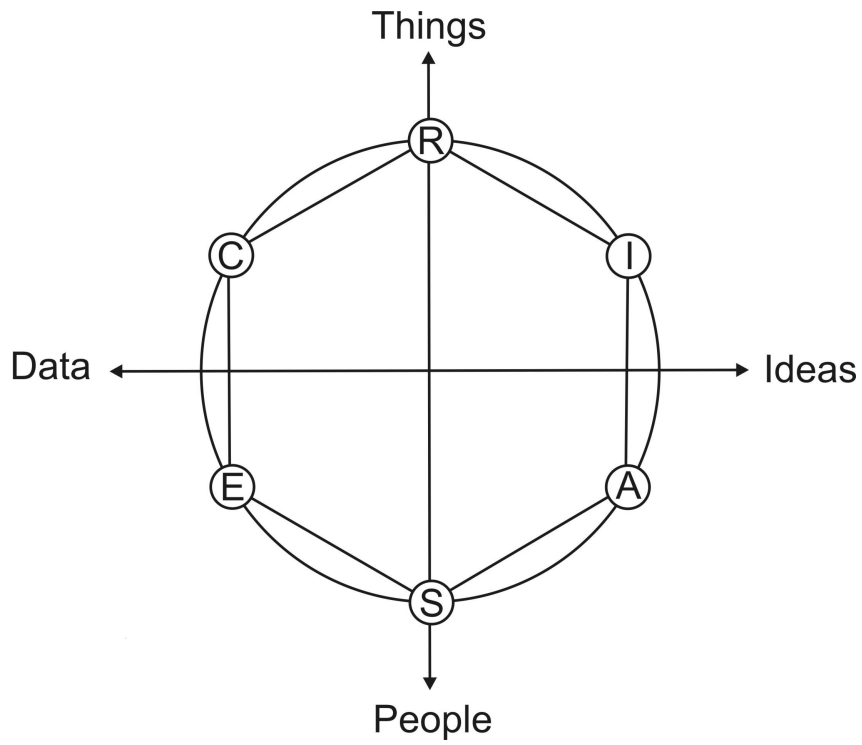


Figure 3. Prediger's (1982) dimensions embedded in Holland's RIASEC model of interests.

Appendix 1

Example calculation of a composite RIASEC code

1. Access O*NET 10.0 to obtain O*NET-SOC codes for each occupation in the category.
 - a. Accountant: 13-2011.01
 - b. Actuary: 15-2011.00
2. Access vocational interest data for each O*NET-SOC code.
 - a. Accountant: CEIRSA
 - b. Actuary: CIREAS
3. Obtain the numerical value for each RIASEC type.
 - a. Accountant: C: 7.00 E: 4.66 I: 3.66 R: 2.66 S: 2.66 A: 1.66
 - b. Actuary: C: 7.00 I: 5.33 R: 4.00 E: 3.66 A: 2.00 S: 2.00
4. Compute an average value for each RIASEC type.
 - a. R: 3.33 I: 4.450 A: 1.83 S: 2.33 E: 4.16 C: 7.00
5. Determine the order of the composite code, from largest to smallest.
 - a. CIERSA

Appendix 2

Summary of Data Collection Timeline

Data Collection Point	Year Graduating			
	1981	1982	1983	1984
Time One (1981)	Y	Y	Y	Y
Time Two (1982)	N	Y	Y	Y
Time Three (1983)	N	N	N	Y

Note. Y = Data available from this cohort at the data collection point, N = data not available from this cohort at the data collection point.

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