

**Career Development Outcomes of College Student Involvement  
in Out-of-Class Activities:**

**A Liberal Arts and Sciences Alumni Follow-Up Study**

by

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(ABSTRACT)

Career development theory suggests that the exploration process, an important stage of early adulthood, is facilitated by meaningful involvement in a variety of activities. This theoretical tenet is widely accepted, yet little empirical evidence exists to demonstrate the extent to which exploratory behaviors, as exhibited in undergraduate involvement in out-of-class activities, serve to enhance the career development process and, consequently, the quality of occupational choice after graduation. The purpose of this study was therefore to analyze the degree to which college student involvement in educational, work, and leisure out-of-class experiences related to career development status and three dimensions of the initial work experience--career satisfaction, career stability, and occupational mobility.

Survey data were collected from 243 liberal arts and sciences bachelors degree recipients in Spring of 1986 who did not pursue additional education or homemaking on a full-time basis (52.6 percent return rate). Step-wise multiple regression results demonstrated modest, yet significant, relationships between involvement in categorical and summed educational, work, and leisure activities, as well as academic factors (college major and QCA), and satisfaction in career progress, satisfaction in current employment, career stability, and occupational mobility (R-squares ranged from .01 to .18). Relatively low Differential Career Status Scores made it impossible to generate significant results for the career development status criterion. These results provided little assistance in helping to define exploratory behaviors.

In contrast, participation (a critical component of involvement) in specific undergraduate activities indicated strong, yet curious, relationships with all criteria variables when compared to those who did not participate. Interestingly, t-tests demonstrated that former students who met with career counselors, referred to career-related written materials, used computer assistance programs, and attended related seminars were less satisfied with their current employment, less stable, and more mobile. Conversely, those who were members of professional and social

organizations, employed in internships, and engaged in intramural sports, and enrolled in the Cooperative Education and ROTC Programs experienced opposite results.

Participation in various activities, therefore, may serve to facilitate or inhibit aspects of the career development process.

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## CHAPTER I

### INTRODUCTION

Exploration and mobility clearly mark the initial work careers of college graduates. High rates of job change and low levels of satisfaction among young employees can be attributed to the lack of clear career goals (Benner & Hitchcock, 1986; O'Neal & Wallace, 1980) and illustrates what Schein (1964) labels "the self testing process" (p.63).

Although career outcomes are influenced by myriad factors such as work conditions, personal attributes, and background, it is also believed that one's long-range career is inordinately influenced by the initial work experience, (Nafziger, Holland, Helms, & McPartland, 1974; Parsons & Wigtil, 1974; Warren, Winer, & Dailey, 1981) which, in turn, is preceded by adequate opportunities for occupational exploration and preparation (Phillips, 1982b; Super, Kowalski & Gotkin, 1967). Exploratory behaviors, as exhibited in undergraduate involvement in out-of-class activities, may be directly related to the building of a solid career foundation, resulting in an appropriate, congruent occupational choice. It is this aspect of involvement that is of most interest in this study. Do undergraduate students who engage extensively in out-of-class experiences manifest

greater levels of career development, career satisfaction, and occupational stability than those who do not?

Educators, whether in the academic, administrative, or student affairs arenas, need to have a full and complete understanding of the career development process during the college years in order to provide services and develop programs and curricula to best foster career decision making and appropriate occupational choice. According to Kessler,

There is a critical need for more extensive data, both short- and long-range, on the career outcomes of college graduates and the factors that affect those outcomes. Such career-related data could be used by educators, by employers, and most importantly, by students in improving the relationship between education and work. (1979, p. 53)

### **Background**

Occupational choice is a reflection of many influences; adequate opportunities for occupational exploration and preparation are major facets of this process (Phillips, 1982b; Super, Kowalski, & Gotkin, 1967). Both vocational theory (Super, 1957) and student development theory (Astin, 1979, 1983; Pace, 1979, 1984) provide insight into dimensions

of growth, development, and exploration as they relate to college students and the career decision making process.

Super's (1957) life-span approach to vocational development proposes that individuals between the ages of 15 and 24 progress through the exploration stage. A direct function of career exploration is the implementation of exploratory behaviors such as searching, experimentation, trial, and hypothesis testing (Jordaan, 1963). Behaviors such as these serve to enhance the awareness of occupational options, work responsibilities, and personal competencies, as well as the development of skills and a knowledge of the world of work (Super, 1957; Super & Bohn, 1970).

According to Jordaan (1963), exploration refers to the activities, mental and physical, undertaken with the avowed or unconscious purpose or hope of eliciting information about oneself or one's environment, or of verifying, or arriving at a basis for a decision, conclusion, solution or hypotheses, or of being entertained, challenged, or stimulated (p. 57).

It is clear that career development occurs not only as a result of personal development, but also as a result of experiences that enable an individual to define career goals more realistically (Astin, 1967).

Other theoretical tenets substantiate that aspects of involvement during the college years prove to be key to student development (Astin, 1979, 1983; Pace, 1979, 1984). According to Astin's student involvement model (1984), the amount of learning and development is directly proportional to the quality and quantity of student involvement in a given activity or program. Study results demonstrated that participation in activities, programs, and relationships (i.e., part-time campus employment, extracurricular activities, the residential experience, and relationships with staff and professors) was positively associated with the enhancement of learning and growth and consequently with college persistence and satisfaction (Astin, 1975, 1983, 1984; Bisconti, 1979; Chickering, 1974). Simply stated, Astin's theory advocates that involvement leads to satisfaction and persistence.

Numerous settings provide opportunities for exploration and involvement. Bolles (1981) partitions life's experiences into "three boxes of life:" time devoted to learning (education), time devoted to work, and time devoted to play (leisure and recreation) (p. 5). Of the career development studies conducted on college student involvement in various out-of-class experiences, most can be placed in Bolles' three categories: educational experiences, work experiences, and leisure experiences. Many of these studies clearly

demonstrate immediate effects of student participation activities, events, and programs. For example, career education interventions, such as counseling programs (Healy, 1974; Mendonia & Siess, 1976) career planning courses (Babcock & Kaufman, 1976; Evans & Rector, 1978; Reed, 1984) and a career exploration program (Tillar, 1978) improved aspects of student career development and decision making.

Assessments of established work programs, such as internship and cooperative education programs, and self-selected employment have identified career-related benefits as a result of student participation. For example, student and university perceptions of the immediate effects of enrollment in cooperative education and internship programs indicated that student participants--increased knowledge about the job, reinforced classroom theory, and developed a relationship between theory and practical application (James, 1986; Tyler, 1971; Wilson, 1971); grew personally and professionally, enhanced skills, devised clearer career direction, and increased employability (Jobst, 1986; Page, Wiseman, & Crary, 1982); and developed leadership skills and attitudes about self in the work place (Stadt & Gooch, 1977).

In addition to educational and work activities, a number of studies have investigated the effects of student involvement in leisure/extracurricular activities. Williams and Winston

in leisure/extracurricular activities. Williams and Winston (1985) found that students engaged in recognized student organizations scored significantly higher on the Mature Career Plans scale of the Student Development Task Inventory (Winston, Miller, & Prince, 1979) than those who did not participate. Similarly, Astin's study (1975, 1979, 1983) indicated that involvement in honors programs and athletic clubs, and fraternities and sororities also contributed to the advancement of personal development and aspects of the career decision making process.

These studies clearly demonstrate that some immediate benefits were gained through student involvement in specific experiences while enrolled in college. Little effort, however, has been made to take the next step and measure whether career-related benefits gained from program and activity participation yield long-term, or what McHugo and Jernstet (1979) entitle the "transfer effect" (p. 200), on post-college employment experience. The "transfer effect" refers to maintaining new learning and changes and transferring them into post-experience environments. In this case the post-experience environment is the initial work period after college graduation.

Few alumni studies have addressed experiences during college that influence aspects of the initial work experience. These

limited contributions fall into three categories. First, follow-up studies have compared cooperative education participants to non-participants once in the job market. Jagacinski, LeBold, Linden, and Shell (1986) found that cooperative education graduates not only had higher salaries but also experienced a higher level of job satisfaction in their first jobs after college graduation when compared to those who were not enrolled in the program. Second, alumni who reported involvement in pre-graduation work experiences and internships scored significantly higher in the areas of job satisfaction and occupational stability in their initial work experiences (Richards, 1984a, 1984b). Third, aspects of post-college success are also attributed to voluntary involvement in various extracurricular activities, such as painting, creative writing, scientific investigation, participating in campus plays, and joining student organizations (Munday & Davis, 1974; Sprinthal, Bertin, Whiteley, 1982).

While these studies provide some information regarding the sustained effects of various programs and activities, all of them fail to address the extent to which involvement in a culmination of educational, work, and leisure activities during the college experience serve as a function of the exploration process, thus enhancing the career development

process and influencing the quality of the initial work experience after graduation.

### **Statement of the Problem**

Career development theory suggests that the exploration process, an important stage of early adulthood, is facilitated by meaningful involvement in a variety of experiences. This theoretical tenet is widely accepted, yet little empirical evidence exists to demonstrate the extent to which exploratory behaviors, as exhibited in undergraduate involvement in out-of-class activities, serve to enhance the career development process. Whereas a number of studies have investigated immediate career-related benefits of activities, programs, and experiences, few have taken it one step further to measure whether sustaining effects are evident during the initial work experience after graduation. To date, no research has assessed the extent to which student involvement in educational, work, and leisure activities enhances dimensions of the career development process and the quality of occupational choices during the initial work period, as reflected by job satisfaction and occupational stability.

### **Statement of the Purpose**

The purpose of this study is to analyze the degree to which undergraduate student involvement in out-of-class

experiences relates to the advancement of the career development process and critical aspects of the initial work experience after graduation, specifically, job satisfaction and occupational stability. Super's (1982) construct of involvement served to measure the level of educational, work and leisure involvement among 1986 liberal arts and science graduates from Virginia Tech. In addition, Astin's (1983) model of student development (involvement leads to satisfaction and persistence) was incorporated to investigate whether student involvement during the college years contributes to job satisfaction and occupational stability.

### **Research Questions**

1. What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure activities) and career satisfaction?
2. What is the relationship between college student involvement in our-of-class experiences (educational, work, and leisure activities) and career stability?
3. What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure activities) and post-college status of career development?

## Limitations

1. Recent college graduates tend to be mobile, and therefore university records of alumni addresses are not 100 percent accurate or complete. The Virginia Tech Alumni Association does not have a comprehensive, accurate file of current addresses of 1986 bachelor's degree graduates. The results of this study, therefore, may not be representative of the entire graduating class.
2. This study required individuals to provide self-reported, retrospective data regarding experiences during their undergraduate college tenure. This form of data gathering inherently relies on memories, which potentially involves problems with reliability and recall error, and therefore produces some inaccurate data (Balan, Browning, Jelin, & Litzler, 1969; Nafziger, Holland, Helms, & McPartland, 1974, Phillips, 1982c). Recent college graduates (1986) were surveyed to minimize this effect.
3. Institutional size has been attributed to affecting levels of student involvement and consequently differential aspects of personal development (Astin,

1983). A negative correlation exists between institutional size and degree of student participation in activities, relationships with campus personnel, and programs. Due to the nature of the large public university selected for this study, student involvement in activities, programs, and employment may differ systematically from that of students from smaller institutions or private institutions.

#### **Assumption**

The alumni chosen for this study were asked to consider the activities in which they were engaged during their junior and senior years. This measure was taken based on the assumption that these years represented the level and patterns of student involvement over the entire undergraduate experience.

#### **Significance of the Study**

The results of this study will:

1. provide evidence regarding theoretical dimensions of student involvement, vocational exploration, and other aspects of the career development process;
2. clarify aspects of existing knowledge and understanding of career development and explore its association with the theory of involvement;

3. provide the university with current information regarding the career paths of 1986 liberal arts and sciences alumni as well as information regarding their experiences during their college experience;
4. produce useful information for student affairs administrators, departmental career and academic advisors, placement counselors, cooperative education coordinators, and other University personnel as they develop programs and provide assistance and advice to students regarding effective means by which to facilitate the career development, exploration, and decision making process;
5. supply additional information to liberal arts and sciences majors regarding activities which relate to job satisfaction, occupational stability, and career development status; occupations held by their predecessors a year and a half after graduation, and other factors that might assist them in their career decision making process; and
6. provide information to recruiters and employers regarding the benefits of experiential activities as they relate to the advancement of the career decision making process and, therefore, the level of job satisfaction and occupational stability.

### Definition of Terms

The following terms are incorporated in this study and will be defined as follows:

Career: Refers to a lifestyle concept which includes "a sequence of occupations and leisure-related activities in which one engages" (McDaniels, 1982, p.3).

Career Development: Refers to "a part of human development. A person develops--from stage to stage--the awareness, exploration, motivation, decision making, and preparation for a particular occupation or leisure activity. In short, career development equals work plus leisure" (McDaniels, 1982, p. 3).

Career Satisfaction: Refers to the degree of contentment regarding three aspects of employment; including career progress, current employment situation, and future career prospects.

Career Stability: Refers to one's intention to remain or change occupational fields (Richards, 1984b).

Horizontal Occupational Movement: Refers to any job movement that involves a transition from one work position to another

work position regardless of socioeconomic level (Miller & Form, 1964, p. 561).

Internship: Refers to an arranged experience "whereby students work at off-campus jobs which are related to their academic disciplines and analyze their experiences for college credit" (Downs, Harper, & Hunt, 1976, p. 276).

Involvement: Refers to the extent to which an individual both participates in (behavioral component, denoting action) and is committed to (conative component, denoting an emotional attachment) a role or activity (Super, 1982).

Position: Refers to a group of activities, tasks, or duties performed by one person; a post of employment. Position and job will be used synonymously in this study.

Post-College Status of Career Development: Refers to the level at which one operates on the continuum of the career development stages and tasks after the college experience.

Job Change: Refers to changes in one or more of the following: occupations, employers, industries or geographic locations (Parnes, 1954, p. 24).

Leisure: Refers to those activities and experiences that are relatively self-determined and are "available due to having discretionary income, time and social behavior. These activities may be physical, intellectual, volunteer, creative or a combination of these" (McDaniels, 1982, p. 3).

Occupational Mobility: Refers to the number of changes of jobs by an individual (Blau & Duncan, 1967).

Vertical Occupational Movement: Refers to a job movement between socioeconomic levels (Miller & Form, 1964, p. 561).

Work: Refers to the "conscious effort aimed at producing benefits for oneself and/or for others. It is centered around the human need for productivity. It is a concept that, while obviously encompassing the economic person, goes beyond this to a broader aspect of productivity in one's total life" (McDaniels, 1982, p. 3).

Work Career: Refers to a sequence of jobs during an individual's work life (Super & Hall, 1978, p. 334).

Work History: Refers to a retrospective account of one's employment record (Miller & Form, 1964).

## CHAPTER II

### REVIEW OF THE LITERATURE

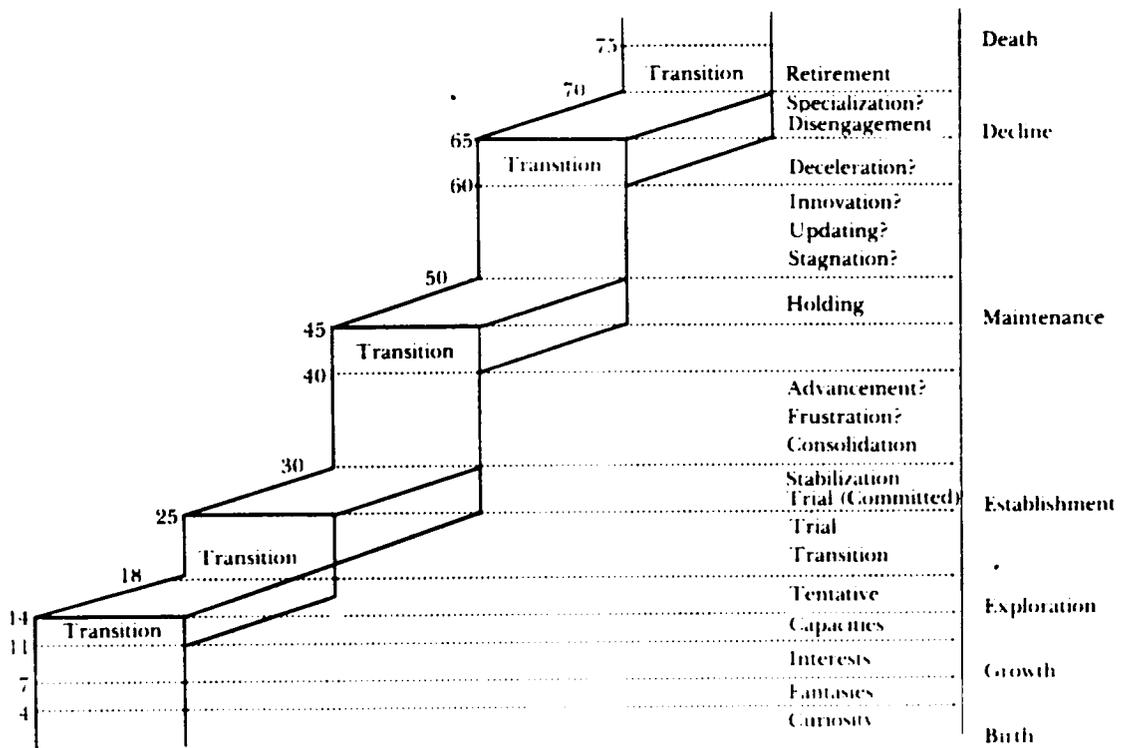
This chapter is a review of the literature and is divided into three major sections. The first section pertains to career development theory, career exploration, student involvement theory and the arenas for exploration and involvement during the college years. The second section centers around the initial work period following college graduation and addresses specific aspects such as occupational choice, the importance of the first jobs, occupational mobility and stability, and job satisfaction. The third section presents research provided by alumni follow-up studies regarding undergraduate involvement as related to occupational stability and job satisfaction.

#### Career Development Theory

Career psychology has developed over the years and considers the occupational positions one holds over a lifetime (Super & Bohn, 1970). This field is undergirded by developmental psychology and regards career development as the lifelong process of developing beliefs, values, skills and aptitudes, interests, personality characteristics and knowledge of the world of work (Buehler, 1933; Gribbons & Lohnes, 1968; Super, 1957).

Perhaps the most comprehensive career development theory was formulated by Super (1957, 1980, 1985; Brown & Brooks, 1984; Bailey & Stadt, 1973; Gordon, 1981). Influenced by Buehler's (1933) work on stage theory of human development, and the refinement of aspects of vocational theory developed by Ginzberg and associates (1951) by Harren, (1966) and Tiedeman and O'Hara, (1963), Super sought to apply the concept of human development to the career development of adolescents and adults in his initial research, the Career Patterns Study (CPS) (1957). As a result, he postulated a maxicycle, life span theory with five stages of career development which provides explanations of development and has been generally supported by many other studies (Jordaan, 1963, 1974; Pascarella & Staver, 1985; Osipow, 1983; Slocum & Cron, 1985).

Super's vocational stages were not only predictive but also characterized by five specific vocational behaviors and attitudes known as vocational tasks (See Figure 1). In brief, these age-linked developmental stages are the Growth Stage (birth - age 14), the Exploration Stage (age 15 - 24), the Establishment Stage (age 25 -44), the Maintenance Stage (age 45 - 64), and the Decline stage (age 65 and older). The corresponding vocational tasks include crystallization (age 14 - 18), specification (ages 18 - 21), implementation (ages 21 - 24), stabilizing (ages 24 -29), consolidating (ages 30



**Figure 1.** Super's Stages and Substages of Career Development

Note: Brown, D., Brooks, L., and Associates. (1984). Career choice and development. San Francisco, CA: Jossey-Bass. p. 202. Reprinted by permission of Jossey-Bass.

- 44), holding, updating and innovating (ages 45 - 59), deceleration and retirement plans (ages 60 - 64) and retirement living (ages 65 and above).

Developmental tasks included in Havighurst's (1953) theory of development are fundamentally similar to those of vocational development. Individuals are confronted by a set of tasks at each stage and are expected, by society, to deal effectively with those tasks. The successful coping and completion of each task is essential to the development of those in the next.

Although a chronological relationship exists with career stage and dominant vocational tasks, Super later found another phenomena. Specifically, the utilization of vocational tasks was not restricted to specific age ranges as originally documented. Bimodal and trimodal profiles on the Adult Career Concerns Inventory (ACCI) revealed task concerns from more than one stage (Super, 1987). For example, exploration tasks might also become important during one's mid-career in an attempt to maintain one's current status while investigating alternative occupational options. A mini-cycle within the maxi-cycle phenomenon is therefore illustrated by this theoretical model (Figure 1).

## **Career Exploration**

For the purpose of this study, which focused on young adults during the span of college years through the initial work periods after graduation, more detail concerning the Exploration Stage is necessary to better understand the nature of individual experiences.

Ginzberg and his associates (1951) were the first to regard the comprehensive treatment of exploration within the confines of vocational theory, assigning it a critical role in the occupational choice process. They postulated that, during the period of realistic choices, an individual explores self and the outside world in order to test new experiences, search for new perspectives, and increase understanding of reality. Without exploration, crystallization and specification would not be likely to occur.

Within Super's theoretical framework, individuals between ages 15 and 24 experience self-assessment, role playing, and occupational exploration through their involvement with home, school, community, and employment activities (Super & Bohn, 1970). Between ages 15 and 18 adolescents demonstrate the vocational task of crystallization and become aware of personal interests, values, capacities, opportunities, and resources in order to begin the formulation of vocational

goals. This lays the foundation for the task of specification (age 18 to 21) in which general career direction becomes narrowed through training and education. Between ages 21 and 24 implementation tasks occur and include the completion of the training process followed by the pursuit of relevant employment. While employed, those between ages 22 and 24 experience the trial sub-stage which is characterized by numerous, short-term jobs. Eventually, individuals begin to settle down and find appropriate fields of work, thus entering the Establishment stage (25 - 44) when they experience less trial and more commitment during the task of stabilization (Super, Starishevsky, Matlin, & Jordaan, 1963).

Definitions of exploration have been established over the years. Berlyne (1960), an experimental psychologist, held that the chief function of exploratory responses was to obtain information about some aspect of the environment. Jordaan (1963) concurred with this general notion and added that its relevance to vocational exploration made it necessary to expand the definition to include the acquisition of knowledge of self as well as about the environment. Perhaps Super (1957) captured the essence of the meaning of exploration for the adolescent and young adult by stating that exploratory activities are essential to the development

of self-understanding and an understanding of the world of work.

While some hypothesize that deliberate, purposeful behaviors are more likely to achieve desired outcomes, it is stated by others that an individual engaged in an experience may or may not be aware of "the purpose, its origin, or the fact that he is exploring" (Jordaan, 1963, p.55). Jordaan's proposed dimensions of exploratory behavior support this general notion. For example, he contends that exploration can be described by a series of antonyms: intended versus fortuitous, systematic versus random, and contemporaneous versus retrospective behaviors. The diverse nature of exploratory acts therefore merit consideration when assessing college student involvement all activities. Whereas many studies have asked respondents to rate various college experiences in association with aspects of career development and decision making process (Bisconti, 1979; Ochsner & Solmon, 1979), few have recognized that unconscious, inadvertent relationships might be operating and therefore not identified by the participant.

Noteworthy exploratory acts encompass essential elements such as searching, experimentation, trial, and hypotheses testing (Jordaan, 1963). These behaviors are not exclusively exercised within vocational settings (Jordaan, 1963). They

also occur when an individual is exposed to or involved in other environments, or life theatres (Super, 1980), such as home, community, school, and the work place.

### **Theory of Student Involvement**

Astin's (1983) theory of student development is qualitatively different from the developmental theories. Developmental theories, for example, posit hierarchically arranged developmental stages with a primary focus on student outcomes, accounting for the what in development. The student involvement theory focuses primarily on qualitative and quantitative participation in various activities, such as residential living, a part-time campus employment, extra-curricular activities, and is more concerned with behavioral mechanisms or processes that facilitate student development. This model partially accounts for the how of student development (Astin, 1984).

Longitudinal analyses of more than 200,000 college students indicated that participation in various aspects of the college experience influenced growth and learning in a number of areas (Astin, 1983). For example, growth and development of values, interpersonal and intellectual competencies, political and religious beliefs, and self-esteem proved to be associated with the phenomenon of involvement. College attendance and subsequent involvement in activities and

relationships such as fraternities, sororities, student government, honors programs, ROTC, intercollegiate sports, and college personnel, resident hall living, and part-time campus employment resulted in a positive relationship with retention and satisfaction (Astin, 1979, 1983; Chickering, 1974). Findings such as these prompted Astin (1979) to view involvement as critical to student development, and consequently central to his theoretical model.

Astin's student involvement model has five basic postulates, four of which are relevant to this study.

1. Involvement refers to the investment of physical and psychological energy in various objects. The objects may be highly generalized (the student experience) or highly specific (preparing for a chemistry examination).
2. Regardless of its object, involvement occurs along a continuum; that is, different students manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times.

3. Involvement has both quantitative and qualitative features. The extent of a student's involvement in academic work, for instance, can be measured quantitatively (how many hours the student spends studying) and qualitatively (whether the student views and comprehends reading assignments or simply stares at the textbook and daydreams).
  
4. The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in the program. (Astin, 1984, p. 298)

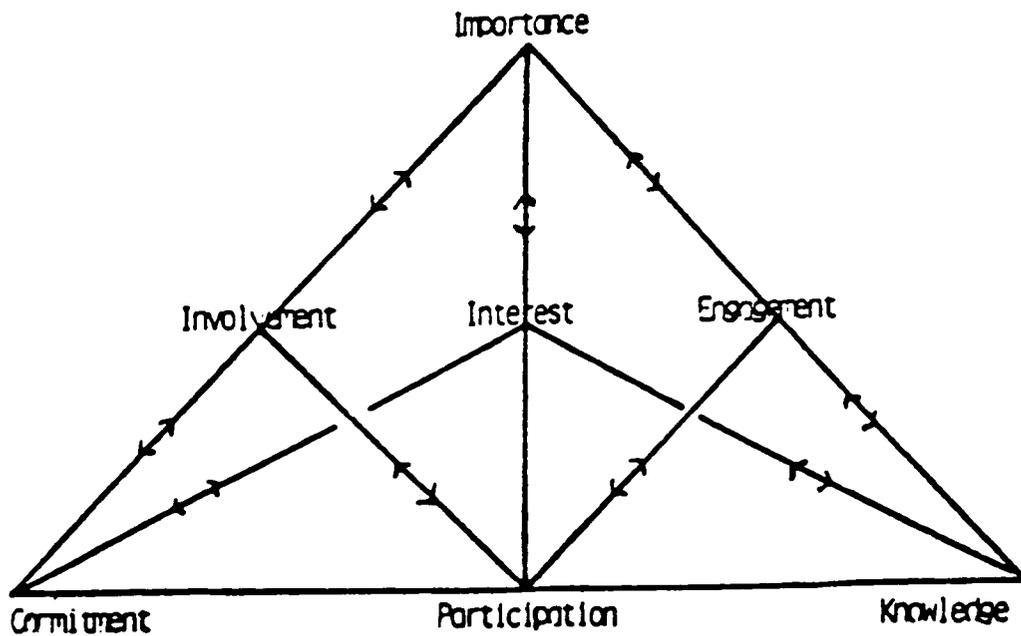
Simply stated, the construct of involvement in Astin's work refers to the quality and quantity of physical and psychological energy devoted to aspects of the educational experience. The higher the level of energy expended by an individual in a given event, the more satisfied he or she will be with the outcomes and thus persistence is enhanced. The student involvement model purports the formula--involvement yields satisfaction and persistence.

Pace (1984) also centered his research on aspects of student involvement. He developed a battery of devices to assess the

quality of effort of undergraduate students with regard to the educational experience and specifically to measure the efforts student devote to various activities. He contended that the level of outcome quality of an experience depends on the quality of investment.

Educational authorities also recognize the principles promoted by Astin and Pace to the extent that the National Institution of Education (1984) developed institutional guidelines to enhance student participation in the learning process based on the admission that "...the more time and effort students invest in the learning process and the more intensely they engage in their own education, the greater will their growth and achievements, their satisfaction with their educational experience, and their persistence in college..." (p. 17).

Whereas Astin and Pace define involvement in terms of quality and quantity, Super (1982) measures this construct in terms of two different components: (a) participation, the behavioral component, which denotes action and (b) commitment, the conative component, which denotes emotional attachment with a role and its activities (See Figure 2). An individual who participates in an event might not be committed to that experience. Conversely, one might value an experience in which he or she is not engaged. Super,



**Figure 2.** Model of the Importance of Work and Other Life Career Roles

Note: Super, D.E. (1982). The relative importance of work: Models and measures for meaningful data. The Counseling Psychologist, 10 (4), 95-103. Reprinted by permission of Sage Publications, Inc.

therefore, submits that a valid indicator of level of involvement is the combination of the effort, as demonstrated by behavior, and the value placed on the activity.

In keeping with the basic notions of Astin's student development model (involvement is the foundation for satisfaction and persistence), Astin (1979) applied his theory to the job search process. "There is an obvious connection between the time spent searching for a job and the quality of the job actually obtained..." (p. 6). It seems therefore logical to assume that the time devoted to one's exploration and preparation for post-college employment would also generate positive results.

#### **Arenas for Career Exploration and Student Involvement**

Young adults engage in a variety of activities during their college tenure to deliberately or inadvertently observe, experience, and test occupations, build skills, and develop competencies in order to make career choices. Life arenas such as education, work, and leisure provide such opportunities and have been identified and described by Bolles (1981), McDaniel (1982, 1984), and Super (1957, 1980, 1982).

Bolles (1981) categorized life's activities as three "boxes of life"--time devoted to learning (education), time devoted

to work, and time devoted to play (leisure and recreation). McDaniels (1974; 1982; 1984) suggested that career incorporates two of these components--work plus leisure. Both are viewed as complimentary and integral constituents of career development throughout the life span. In fact, McDaniels (1965) posed that CAREER = WORK + LEISURE and that these developmental components operate in a parallel and static fashion (Kaplan, 1977; Overs, Taylor, & Adkins, 1977).

Work is defined by McDaniels (1982) as that for which one is paid to perform and leisure is that which one performs on a voluntary basis, without monetary gain. Within the context of these definitions, education would be considered a subset of leisure since it is entered into on a voluntary basis and does not generate an income.

The following sections further illustrate theoretical and practical benefits of involvement in educational, work, and leisure activities as they enhance the exploration process for college students.

## **Educational Activities**

Schooling is regarded by some as "a socially sanctioned training ground for the development of a skilled work force required in an increasingly technological society" (Tinto, 1984, p. 310). Over the years, education's goal--preparation for work--has been forced to accommodate a more specialized, technological, and information-oriented job market (Hoyt, 1979).

The formal academic experience has been attributed to promoting aspects of development (Astin, 1983; Ochsner & Solmon, 1979; Super & Bohn, 1970), yet, additional research revealed that the most significant growth is gained outside the confines of the classroom (Astin, 1979, 1983; Bisconti, 1979; Woolief, 1982). Several alumni follow-up studies confirm these findings through assessments of former student impressions of their college experience. Although graduates felt their course work and degree related to their post college job (Benner & Hitchcock, 1986; Bisconti & Solmon, 1976; O'Neal & Wallace, 1980; Richards, 1984a), prepared them for work (Ochsner & Solmon, 1979; Richards, 1984b), and provided the opportunity to acquire knowledge and skills necessary for the job (Bisconti & Solmon, 1976; Pace, 1979; Richards 1984a; Woodlief, 1982), higher ratings were given with other activities in each case such as on-the-job training

(Ochsner & Solmon, 1979) and prior work experience (O'Neal & Wallace, 1980).

In addition to traditional curricula content and the exposure to a range of subject areas, college and university administrators, faculty, and personnel have acknowledged the need to develop specific educational programs and materials to facilitate the career development process. Numerous interventions produced positive growth in various dimensions of career development. For example, a three-week career program for freshmen and sophomores provided exposure to self and the world of work and significantly increased vocational maturity (Schenk, Johnston, & Jacobsen, 1979). Interactive computer programs, designed specifically to promote vocational awareness, promoted vocational gains for users when compared to non-users (Myers, Lindeman, Thompson, & Patrick, 1975).

### **Work Activities**

Employment while attending college is typical, as indicated by 43 percent of college students in a nationwide study (Green, Astin, Korn, & McNamara, 1983). The work histories of 1,145 liberal arts and science alumni from Virginia Commonwealth University indicated that almost all worked while attending college. Thirty one percent worked on a

full-time basis and 88 percent on a part-time basis (Woodlief, 1982).

Though employment during college serves as a major source of income toward overall college expenses (Schocket, 1985; Super, 1957), other benefits are associated with the work experience. For example, University of Virginia liberal arts and sciences alumni were asked how current college students could make the most of the college years in order to prepare for the job market. Eighty four percent of the 1971 - 1981 graduates encouraged students to get involved in experiential learning in addition to the traditional academic training. Activities such as internships and summer jobs were strongly suggested.

Assistantships, practica, cooperative education and work-study programs, summer jobs, and internships all serve to provide an on-the-job training experience for college students (Morrell & Morrell, 1986). A number of studies have established career-related benefits of work experiences and can be placed in one of two categories: (a) established work programs (Downs, Harper, & Hunt, 1976; Weston, 1983) and (b) self-selected employment (Astin, 1983; McGovern & Tinsley, 1976; Pascarella & Staver, 1985).

The primary goal of established experiential programs, namely cooperative education and internships for college credit, is to arrange work experiences in which students can apply classroom theory, thereby contributing to intellectual and personal growth and career development (Weston, 1983).

Downs, Harper, and Hunt (1976) stated that internships, and other work experiences available through the higher education institution, "are the most practical innovations which interweave academic training with work experience" (p. 276).

Results from a number of studies have both supported program goal achievement and generated additional career-related results. Participant evaluations of internship and cooperative education programs indicated that they revised course schedules to accommodate the need for appropriate or additional classroom training, increased preparedness for the job market, developed awareness of personal strengths and weaknesses, thereby becoming aware of potentials in the work place, gained an advantage in finding a job (Downs, Harper, & Hunt, 1976), and demonstrated a positive relationship between participation in cooperative education and the commitment to career and career identity (Weston, 1986).

Self-selected employment opportunities have also generated positive developmental results. Astin (1983) demonstrated that part-time campus employment was one contributing factor

to growth, college satisfaction, and persistence. In addition, scientific laboratory employment for freshmen and sophomores significantly influenced science career choice during college, when controlling for family background, aptitude, secondary school experience, pre-college career choice, academic major, and college achievement (Pascarella & Staver, 1985). Further evidence was demonstrated by a longitudinal study of those employed in graduate student assistantships in the field of student affairs. Those individuals yielded stable ratings with regard to the influence of this training program on academic preparation and career development (McGovern & Tinsley, 1976).

In an attempt to investigate theoretical tenants for college women's career choices, Almquist and Angrist (1970) found that the number of jobs ( $p < .05$ ) and the scope of jobs ( $p < .01$ ) were significantly associated with career salience and the choice of atypical occupations. In another study, women enrolled in home economics and agriculture programs in southern, land grant universities demonstrated a significant relationship between prior educational and work experiences on the choice of college major and subsequent occupations (Lyson, 1980).

From a theoretical perspective, Super (1957) provided an explanation for the nature and process of the career

development and decision making process for those engaged in the worker role. Employed individuals have the opportunities to integrate their self-concepts in the world of work and to observe the roles of those in the world of work (1957, 1980). Involvement in work activities therefore yields a number of benefits: the development of skills and work habits (such as punctuality, responsibility, and meeting deadlines), the exposure to a wide range of occupations about which they can observe and ask questions, and the opportunity to make adult contacts which may lead to permanent employment. Roberts (1968) indicated that it is through actual work experiences that individuals are able to define interests and thereby make occupational goals.

### **Leisure Activities**

McDaniels (1982) acknowledged leisure as an essential part of the life cycle. He described the ideal elements, functions, and roles of leisure in relation to schooling, extracurricular activities, and work during six life stages. For example, leisure activities, such as enrolling in a horticultural flower arranging course, serving as a treasurer of the political science club, refinishing antique furniture, and working with a cub scout troop, provide opportunities to develop various interests, skills, and overall enjoyment. Those engaged in club and extracurricular activities, within and outside of college, therefore have the opportunity to

investigate broad fields such as farming, politics, drama, science, and journalism without a formal commitment (Super, 1957, 1980).

Two major roles of leisure, as they relate to the career development of college students, are cited by Bloland (1984), one of which is "to help students enhance or facilitate work-related skills and understanding, including self knowledge" (p. 123). A strong position is made that leisure makes direct contributions to occupational awareness and exploration.

College student involvement in activities such as student government, fraternities and sororities, and clubs yields a number of benefits that prove valuable prior to the selection of the first job upon graduation. Not only does one's engagement in such activities provide him or her with an opportunity to function effectively within the framework of an organization, but also potentially builds skills such as group processing, decision making, organizational and administrative, budgeting and accounting, bureaucracies, and programming (Morrell & Morrell, 1986). Extracurricular and volunteer activities, such as tutoring, also have the potential of developing management and performance skills, maturity, and also service to foster the career development process (Winter, McClelland, & Stewart, 1981).

Allen (1985) also considers volunteer activities to make contributions to aspects of the working career. While volunteering has been viewed as an altruistic gesture, he observes that, in essence, these experiences can provide on-the-job training and build individual commitment through involvement.

Williams and Winston (1985) studied student employment and involvement in recognized student organizations on aspects of student development, as determined through the use of the Student Development Task Inventory (Winston, Miller, & Prince, 1979). Though results indicated that scores on the Mature Career Plans scale were not influenced by current employment, they revealed that those engaged in student organizations scored significantly higher when compared to those who did not participate.

It is reasonable to conclude that college student involvement in various educational, work, and leisure activities enhances the career exploration process during the college years. Career decidedness and maturity, skill building, exposure to aspects of the world of work, and the discovery of specific preferences have been documented by numerous research efforts.

### **The Initial Work Period**

Upon graduation from college, initial occupational choices and numerous subsequent changes are regarded as a function of the exploration process (Super, 1957; Super & Hall, 1978). As individuals become increasingly more familiar with themselves and the world of work, changes will occur. This section of the literature review will address three aspects of the initial work period of college graduates. First, occupational choice at the time of graduation and the importance of the first job, second, occupational mobility and stability, and third, job satisfaction as it relates to the initial employment situations.

#### **Occupational Choice at the Time of Graduation**

At the time of graduation many students do not have a clear sense of themselves, the world of work, and career goals, as illustrated by both Indiana University and University of Virginia arts and sciences graduates. In the 1980 study of Indiana University alumni, 85 percent had career plans in mind prior to graduation, yet only 21 percent were achieving those goals at the time of their response (O'Neal & Wallace, 1980). Graduates were asked to account for this occurrence. The majority indicated a lack of knowledge regarding occupational alternatives and felt there was a scarcity of jobs in their original career choice.

Most of the 1971 to 1981 University of Virginia liberal arts graduates reported uncertainty, confusion, and discouragement when pursuing their first jobs after graduation (Benner & Hitchcock, 1986). This was partially due to a lack of firm career direction and knowledge of personal skills. In fact, less than 20 percent said they had "very clear" career direction upon graduation and 64 percent reported feeling "somewhat unclear." The lack of career certainty and direction upon completion of a baccalaureate program could effect the quality of the initial occupational choice and consequently aspects of that job.

#### **Importance of the First Job**

Literature reveals that the selection of an initial job upon college graduation not only provides valuable insight and training for career direction, as reported by University of Virginia graduates (Benner & Hitchcock, 1986), but also influences subsequent jobs. For example, many have applied Holland's personality/work environment scheme to the work histories of adults (Nafziger, Holland, Helms, & McPartland, 1974; Parsons & Wigtil, 1974; Warren, Winer, & Dailey, 1981). Findings indicated that the first job proved to be an efficient predictor of future positions. Evidence also revealed that the first job impacted the success and retention in later occupations (Super & Hall, 1978).

The level of job involvement and satisfaction in the early stage of employment also effect future aspects of the work experience. Rabinowitz and Hall (1981) found a strong and consistent relationship between the level of job involvement in the early early stage of career development with job characteristics and facets of job satisfaction in current jobs of employees in the transportation industry. Mount's 1984 study of corporate managers found a sustained level of satisfaction when comparing the first two years of employment to the level of satisfaction in later years.

While many relate the early employment experiences to personality or work involvement and satisfaction, Holland and Gottfredson (1976) argued that, over time, job choices and work experiences produce a "cumulative effect." This perspective suggests that employers review the work backgrounds of job applicants and make judgements regarding the employability of those individuals based on limited or specialized experiences. This situation consequently inhibits or promotes future occupational possibilities.

### **Occupational Mobility and Stability**

Once in the work force, individuals experience substantial job change and occupational mobility. Numerous studies have been conducted by psychologists, sociologists, and labor economists to investigate the nature of horizontal movement

(the number and duration of jobs) and vertical movement (status levels) (Davidson & Anderson, 1937; Miller & Form, 1964; Saban, 1967; Sommers & Eck, 1977; Super, 1957, 1970).

Within the framework of Super's theory, for example, it has been established that those within the Exploration Stage tend to shift from one job to another more frequently than those in other stages (Slocum & Cron, 1985). In fact, those in the this trial period showed a greater propensity to leave their jobs in search of more appropriate employment. Given the new employee's ignorance of the labor market and ill defined goals, it is not surprising that the process of exploring and gaining knowledge and skills means, for many, that the number of jobs in the initial work period are many and the duration of these jobs is short (Rothstein, 1980).

Occupational mobility is therefore considered a "settling down" process which ultimately may lead to stable work careers. Reynolds (1951) observed that the changing of jobs, occupational mobility, "serves the constructive purpose of educating workers to the realities of employment and of clarifying his own abilities and interests" (p. 133).

Two basic types of occupational movement were proposed as a result of Super's (1957) Career Patterns Study (CPS): floundering and stabilizing. These movements can be further

broken down into specific types of behavior. Stable behaviors are trial (systematic), instrumental (means to an end), and establishing (starting in an appropriate position). Foundering behaviors include floundering (chance) and stagnation (staying in an inappropriate position).

Data from the CPS indicated that over 50 percent of the job changes between leaving school and the age of 25 were of floundering and aimless nature. About one third were considered trial, based on the clear and deliberate choice to change and move, while a small number were getting established or instrumental moves that lead to another appropriate goal (Super & Bohn, 1970). Eight percent of job changers were found to engage in stabilizing movement at the age of 25, one half of whom did not experience much floundering and one fourth continued to make careless moves.

More recent studies also suggest that age is the best single correlate of occupational movement and stability (Quinn, Staines, & McCullough, 1974; Rothstein, 1980). Gottfredson (1977) conducted a retrospective study of males and females over a five-year span. For those between the ages of 21 and 25, 32 percent of the men were in the same occupations and 54.9 percent of the women, whereas for those between the ages of 61 and 65, 77.3 percent and 78.2 percent of men and women, respectively, remained in the same occupation. Consistent

with Gottfredson's research is that of Sommers and Eck (1977) where 50 percent of those under 30 years of age changed jobs and approximately 33 percent changed jobs over 40 years of age over a period of five years.

Two one-year studies were conducted by the Bureau of Labor Statistics (Byrne, 1975; Saban, 1967). Mobility rates of men, during a one year period of time, decreased with age; approximately 35 percent changed at ages 18 and 19, 25 percent at ages 20 to 24, 13 percent at ages 25 to 34 and only 3 percent at ages 55 to 64. Similarly, Parnes, Adams, Andrisani, Kohen, & Nestel (1975) found lower mobility rates experienced among older workers. The partial explanation of which is due to seniority, which inherently provides job security, tenure, and job attachment, as well as labor market conditions and higher levels of job satisfaction.

A number of alumni follow-up studies yield consistent data and confirm research regarding aspects of mobility during the initial years for college graduates. Exploration and mobility, evident by multiple job changes, clearly describe the early working careers after graduation for University of Virginia alumni (Benner & Hitchcock, 1986). One in three graduates changed jobs in the first year and three of four changed in the first three years. Similarly, Virginia Commonwealth University alumni reported holding an average

of 2.8 jobs one to five years after receiving their diplomas (Woodlief, 1982). Humanities majors experienced the greatest number of changes, an average of 3.2, and those who majored in the physical sciences changed the least number of times with an average of 2.3 changes.

### **Job Satisfaction**

Job satisfaction is attributed to a number of factors, one of which is the congruency between one's personality and the work environment (Holland & Gottfredson, 1976). Diverse and homogenous occupational populations have generated consistent results. High levels of congruency are positively related to satisfaction on the job (Holland, 1985; Mount & Muchinsky, 1978; Swaney & Prediger, 1985). Those in the nursing (Hener & Meir, 1981) and accounting (Aranya, Barak, & Amernic, 1981) also yielded positive correlations with satisfaction.

It is also believed that younger employees tend to be less congruent than older employees (Holland, 1985). Over time it was observed that both stability and job satisfaction evolve as an individual becomes more familiar with his or her own abilities and preferences as well as occupational options (Gribbons & Lohnes, 1982). Therefore, as an individual moves from one job to another he or she tends to become progressively more congruent with the chosen occupation and

thus higher levels of satisfaction result (Holland & Gottfredson, 1976).

Other studies address age and positioning in career stages, thus generating mixed findings. Lowther, Gill, and Coppard (1985) found that age was a reliable determinant of job satisfaction among teachers. Although older teachers (over 50 years of age) experienced extrinsic satisfaction when compared to their young colleagues (under 30 years of age), who experienced intrinsic rewards, the older cohorts scored significantly higher levels of satisfaction.

Career stage is closely linked with biological age, as seen by the age ranges assigned to each stage in Super's theoretical model. Slocum and Cron (1985) examined job satisfaction and work performance and determined that they are a function of one's position in career stage. Specifically, those in the trial stage (ages 21 through 30) and experienced higher levels of satisfaction with promotional opportunities than were those in the stabilization stage (ages 31 through 44) and those in the maintenance stage (ages 45 and above). On the other hand, employees in the trial stage showed significantly less overall satisfaction in their current positions than their older counterparts.

Four hundred and eighty three managers employed in a multinational corporation also demonstrated a relationship between career stage and satisfaction (Mount, 1984). For example, those employed for less than two years were reportedly more satisfied with aspects of the job when compared to managers in two higher stage levels. Yet, it is to be noted that those who were satisfied in the advanced stage were those who were highly satisfied in their first years in management as well.

Increasing satisfaction was experienced over time by liberal arts and sciences graduates from Virginia Commonwealth University (Woodlief, 1982). Seventy nine percent of those surveyed were satisfied with their jobs. Alumni from the classes of 1973 to 1977 demonstrated a 82 percent satisfaction rate while graduates between 1966 and 1972 reported a 90 percent rate.

In their investigation of 1971, 1973, and 1975 Indiana University liberal arts and sciences majors, O'Neal and Wallace (1980) found that job satisfaction increased between first and current jobs. During the first jobs, 31.8 percent were very satisfied, 35.6 percent were somewhat satisfied, while 32.6 percent were not satisfied. When reporting their current job satisfaction levels, at the time of the study, 54.9 percent were very satisfied, while only 34.5 percent and

10.6 percent were somewhat satisfied and not satisfied, respectively. Similarly, 51 percent of the 1971 to 1981 University of Virginia graduates indicated a satisfied or somewhat satisfied level of job satisfaction when compared to 85 percent with the current job (Benner & Hitchcock, 1986).

Richards' (1984a) study of University of Massachusetts graduates yielded a lower level of job satisfaction during the first job, 43 percent. A follow-up study during the third year out of college showed less frustration and dissatisfaction. Fifty four percent were satisfied with their current job situation, 57 percent were satisfied with their advancement within their careers, and 76 percent felt a sense of accomplishment.

In addition, Richards (1984a) noted an association between job satisfaction and gender. Women, more so than men, experienced satisfaction with their work (.44,  $p < .0001$ ). These results concurred with earlier findings (Miller, 1980; Robinson, 1969) although no explanations for this phenomenon have been posed. Richards also found that the satisfaction level of significance diminished over time; women showed a moderate relationship to job satisfaction the first year after graduation ( $p < .05$ ), yet this level dropped below level of significance by the third year out of college.

### Alumni Follow-up Research

A number of alumni follow-up studies asked graduates to assess and link aspects of their curricular, extra curricular, and work experiences to job factors such as sources of relevant knowledge, skill building (Bisconti & Solmon, 1976; Ochsner & Solmon, 1979) and whether these activities helped to secure their current jobs (Downey, Bosco, & Silver, 1984). The data generated in studies such as these tend to be simple descriptive statistics, frequencies and percentages, and lacked the element of explanation and relationship among relevant factors of the college and work experiences.

Limited alumni research has addressed experiences during college that influence aspects of the initial work experience. These contributions mainly fall into three categories: (a) follow-up studies of participants and non-participants of internship and cooperative education programs, (b) pre-graduation work experience studies, and (c) extracurricular activities studies.

Jagacinski, LeBold, Linden, and Shell (1986) compared cooperative education graduates to non-cooperative education graduates and found that participants yielded a higher level

of job satisfaction in their first jobs after college graduation. These researchers, as well as others (Bales, 1979; Tyler, 1971), speculate that those who were enrolled in cooperative education programs developed an awareness of "real-life" processes in business and industry and, therefore, developed a more realistic set of expectations, thus resulting in a satisfactory work experience. While these studies did not test for this phenomenon, another investigation reported that former cooperative education students believed they were more realistic than their non-participant counterparts and also experienced greater job satisfaction (Fraunfelder, Schalliol, & LeBold, 1981).

Yensco (1971) did not find a significant relationship between job satisfaction and the cooperative education experience, although prior work experience seems to contribute to occupational stability. In an early study, Coleman (1934) analyzed the work records of those who graduated from liberal arts colleges with cooperative education experiences and those without this experience. Clearly, those with cooperative education experience proved to be more successful and stable during the economic depression. Moreover, those with meaningful work experience during the undergraduate years were better oriented and integrated into the world of work.

One in six University of Massachusetts alumni participated in prevocational programs, such as internships, work study, and in-service training programs, and 75 percent worked in other types of jobs prior to graduation (Richards, 1984b). Those in both categories yielded significantly higher in their perception of their current occupational stability during the initial work experiences (prevocational,  $p < .01$  and pregraduation employment,  $p < .05$ ). Richards offered that this occurrence was probably a reflection of a longer tenure in the job market, when considering pre-graduation experience. Although college major and grade point average were not related to occupational stability, female alumni were more stable than male alumni during their first year out of college ( $p < .05$ ).

Additional research on internships was performed by Atkins (1980) in an attempt to discover whether participation contributed to longevity of employment and satisfaction for new graduate registered nurses. Results indicated that those who engaged in nursing internships remained in their first jobs longer ( $p < .01$ ) and were more satisfied ( $p < .05$ ) than did those without internship experience during their degree programs. As examined by regression analysis, internships were the best predictors of job stability when compared to other factors such as educational background, gender, membership to professional organizations or unions, and age.

Like Richardson and those who researched the effects of cooperative education, Atkins felt that nursing internships provided a realistic experience, thus contributing to a well formulated impression of full-time employment in the field.

Little hard data is available to associate leisure activities with employment related factors, although some aspects of post-college success are attributed to voluntary involvement in various extracurricular (Munday & Davis, 1974, Sprinthal, Bertin, & Whiteley, 1982). For example, engagement in activities such as painting, creative writing, scientific investigation, participating in campus plays, and joining student organization reflects characteristics such as sustained, self-initiated, self-directed activity, which are ingredients necessary for achievement after college, yet no systematic research supports this speculation.

Downey, Bosco, and Silver (1984) surveyed alumni who were active in the student government association and those who were not. Although results did not show strong support for unique long-term outcomes (positive or negative) regarding the college experience, adult accomplishments, and employment history, there was a statistically significant relationship found for those who reported high levels of involvement in college activities and high levels of current job satisfaction using multivariate analyses of variance ( $F(1,$

136)= 6.89,  $p < .001$ ). Little actual differences were found with other factors such as respondent grade point average, length of time in current employment, or number of jobs.

Achievement in campus activities, such as college publication, class or club leadership and team management, resulted in the success (as measured by salary levels) of AT&T managers in a longitudinal study. Those with substantial college achievement in such activities were found in the top one third of the salary range 43 percent of the time when compared to 28 percent of the time for those who did not actively participate in campus activities.

#### Summary

Although a majority of new employees with bachelors degrees are somewhat unclear regarding their career plans and occupational choice, it is nevertheless clear that the initial choice of employment is important, affecting aspects of subsequent employment. College courses, counseling, work experience, and extracurricular programs have been designed to foster the career decision making process during the college years and have yielded positive results upon completion of the program. Few studies have looked beyond the college experience to discover whether participants made appropriate occupational choices. While literature demonstrates that a few specific work experience programs and

leisure activities facilitate career development, job satisfaction, and occupational stability, to date, no work has been done to take an in-depth look at a culmination of education, work, and leisure activities as they effect employment after college graduation.

## CHAPTER III

### METHODS

This chapter details the the methods s used in this investigation. The population, instrumentation, and variables are described. The research plan is presented and procedures for data collection, questionnaire distribution, and methods of data analysis are discussed.

#### Population

The population for this study is 632 Virginia Tech, Liberal Arts and Sciences graduates who completed their bachelors degree requirements in the Spring of 1986. This subgroup of the 1986 graduating class includes 29 undergraduate majors in four academic areas within the College of Arts and Sciences: Humanities (N = 99), Social Studies (N = 244), Natural Sciences (N = 167) and Math Sciences (N = 121), (See Table 1).

For the purpose of this study, all graduates from this population who indicated, at the time of graduation, that they had immediate plans to pursue a graduate degree or continue their education on a full-time basis (approximately 18 percent) were eliminated from this study. The decision to exclude this subgroup was based on the desire to assess

Table 1

Number of Spring 1986 Arts and Sciences Graduates by Major

Division	Major	Number of Graduates (N = 632)	Mailing List (N = 477)
Humanities	Art	11	8
	English	40	27
	French	-	-
	German	-	-
	International Studies	13	8
	Liberal Arts and Sciences	17	15
	Music	3	3
	Philosophy	1	1
	Spanish	10	8
	Theatre Arts	4	1
	Total	99	71
Social Studies	Communications	93	84
	Economics	13	8
	History	29	26
	Political Science	54	39
	Psychology	38	25
	Sociology	13	11
	Urban Affairs	4	4
	Total	244	197
Natural Sciences	Biochemistry	28	14
	Biology	77	46
	Chemistry	26	13
	Geography	13	9
	Geology	6	5
	Geophysics	3	2
	Nuclear Science	5	5
	Physics	9	8
	Total	167	102
Math Sciences	Computer Science	77	72
	Mathematics Education	1	1
	Mathematics	36	30
	Statistics	7	4
	Total	121	107

information from only those who made an occupational choice and entered into the job market soon after graduation.

High levels of occupational and geographical mobility characterize recent college graduates (Miller & Form, 1964; Quinn, Staines, & McCullough, 1974; Rothstein, 1980) and subjects selected for this study could have been difficult to locate. In order to increase the chances of obtaining an adequate number of responses necessary for statistical analyses, a total population study was conducted on all liberal arts and sciences graduates who completed their bachelor's degree requirements in Spring 1986, did not continue their education on a full-time basis, and for whom the Virginia Tech Alumni Association had current addresses (N = 477).

There were three reasons for selecting the Class of 1986 and, in particular, this subgroup of spring graduates. First, the use of retrospective reporting, which was employed in this study, required alumni to account for aspects of their college experience. This form of data may introduce a recall problem or error (Balan, Browning, Jelin, & Litzler, 1969; Nafziger, Holland, Helms, & McPartland, 1974, Phillips, 1982c). Recent college graduates were surveyed to minimize this potential effect.

Second, Super (1987) suggested and Richards (1984a, 1984b) and Weston (1986) demonstrated that the effects of an experience were more pronounced when less time existed between the past experience and a current situation. In this case, the influence of experiences during college tend to be stronger during the first few years after college graduation. This study of recent college graduates, one and a half years after graduation, was designed to both minimize the problem inherent in retrospective research and maximize the influence of student involvement on the post-college work experience.

Third, the purpose of investigating only those who completed their degree requirements during the spring quarter was to ensure that all subjects had been out of college for an equal length of time. Another subgroup of the same graduating class, namely those who completed their degrees in the Summer of 1985, had been out of school up to 11 months longer than those selected for this study. Therefore, other members of the class of 1986 were not considered in the study.

Records of alumni addresses are housed with the Virginia Tech Alumni Association. These data, as well as student post-graduation plans, were initially secured during the final quarter of the students' senior year through the Pre-Graduation Program administered by the University Placement Services. Among the information supplied by the

students was their expected address upon graduation. Students were encouraged, at that time, to contact the Alumni Association with any future address changes. The Alumni Association updates former student addresses through various means such as alumni reunions and chapter meetings, academic department contacts, population surveys conducted every four years in conjunction with the publication of the alumni directory, and by forwarding addresses obtained by the United States Post Office.

### **Instrumentation**

For the construction and administration of this alumni mail survey, every effort was made to increase the quality and quantity of the response rate and the collection of data. Numerous procedures espoused by Dillman (1978) and Babbie (1973) were taken into consideration in the instrument design, dissemination, and collection. A detailed schedule of the research plan is located in Appendix A.

### **Questionnaire Design and Content**

The survey instrument used in this study included three sections: (a) background data, (b) student involvement in out-of-class activities, and (c) the Adult Career Concerns Inventory. The first and second sections were designed by the researcher and the third was designed by Super, Thompson, and Lindeman (1985).

Background data included college major, parents' educational background, gender, quality credit average (QCA) at the time of graduation, employment status (whether or not employed), and current and previous job title. These variables were considered in this study for two reasons: (a) literature demonstrates that background and academic factors (Cohen, 1984; Porter, 1974; Smart, 1986; Super, 1984) are related to dimensions of post-college employment, and (b) to account for the variance among dependent variable scores not addressed by experiential variables of involvement in educational, work, and leisure activities.

Based on Bolles' (1981) "three boxes of life" categories, the student involvement section was divided into three major experience categories: educational experiences, paid work experiences, and leisure and volunteer/non-paid experiences. Listings of specific out-of-class activities for each category were derived from literature (Astin, 1983; Bisconti & Solmon, 1976; Card, 1978; Ochsner & Solmon, 1979; Richards, 1984a, 1984b; Williams & Winston, 1985) and from opportunities available to students at Virginia Tech.

Two subsections for each experience category included (a) participation and (b) commitment. The key to Astin's (1983) involvement model (involvement leads to satisfaction and persistence) and Super's (1982) definition of involvement as

participation (action) and commitment (emotional attachment) provided guidance for the development of this portion of the survey instrument.

The Adult Career Concerns Inventory (ACCI) (Super, Thompson, & Lindeman, 1985), the third section of the questionnaire, was designed to measure adult concerns regarding career development tasks for four of Super's (1957) vocational stages: exploration, establishment, maintenance, and deceleration. Each stage included three tasks, or subscales. For the exploration stage, the crystallization, specification, and implementation tasks are measured. The establishment stage is associated with the stabilizing, consolidating, and advancing tasks. For the maintenance stage, the holding, updating, and innovation tasks are considered and the decelerating, retirement planning, and retirement living tasks are measured for the deceleration stage. Twelve factorially independent scores, therefore, yield an individual career development profile.

The deceleration stage was excluded from this study because the associated tasks focused on retirement issues. It is doubtful that recent college graduates would concern themselves with these vocational tasks at this point in their working careers; therefore, the exploration, establishment,

and maintenance stages and nine corresponding tasks were used for this research.

Initially, the ACCI was entitled the Career Development Inventory--Adult Form (1981). Although Super's theory purports that a chronological relationship exists with career stages and dominant vocational tasks, this does not restrict the implementation of tasks to exclusive stages. Bipolar and tripolar profiles demonstrated that individuals implement multiple task concerns simultaneously (Super, 1987; Super & Hall, 1978). In other words, no concerns are limited to a specific age group (Maloney, 1986). It is for this reason that the term "concerns" was incorporated in its title rather than the term "development," which connoted linearity (Super & Kidd, 1979).

Reliability data on early ACCI forms demonstrated that both stages and subscales yielded alpha coefficients in the .80s and .90s (Cron & Slocum, 1984; Phillips, 1982a; Super, Zelkowitz, & Thompson, 1981). The recent version of the ACCI (1985) also produced high internal consistency reliabilities on the 12 subscales. Super's (1987) study of 68 professional staff members of a northwestern technical university generated coefficients between .78 (deceleration) and .95 (retirement living). Similar findings were experienced in Maloney's (1986) study of 331 employees from a major

international corporation. Alpha coefficients ranged from .81 to .96 (See Table 2).

Although several content validity (Phillips, 1982a; Zelkowitz, 1974) and concurrent validity (Phillips, 1982a; Slocum & Cron, 1985) analyses were performed on the initial forms of the ACCI, limited efforts have been made to establish validity for the 1985 instrument. Concurrent validity, computed from Maloney's (1986) study, indicated that when stage concerns were used to predict chronological age, estimates for half of the subjects proved to be accurate. The accuracy of this prediction positively increased in relation with subject job level.

Gender differences, in relation to career concerns, were investigated for both the earlier versions of the ACCI and the current edition. No gender differences were found for the former instrument when used in a retrospective study of 980 subjects between the ages of 23 and 27 (Herr, Good, McCloseky, & Weitz, 1983) or in a study of 133 professionals enrolled in a continuing education course (Phillips, 1982a).

The most recent edition of this instrument, on the other hand, produced significant gender differences in Mahoney's (1986) research. Women scored higher ( $p < .01$ ) than men in

**Table 2**

Alpha Coefficients of Internal Consistency for the ACCI

Stage/Substage	Academic Professionals (N = 68)		Corporate Employees (N = 331)
	Alpha	S.E.M.	Alpha
Exploration	.92	2.7	.96
Crystallization	.81	2.0	.91
Specification	.865	1.9	.90
Implementation	.87	2.0	.90
Establishment	.92	3.3	.95
Stabilizing	.885	1.8	.90
Consolidating	.815	1.8	.90
Advancing	.87	1.5	.90
Maintenance	.93	2.9	.96
Holding	.87	1.6	.90
Updating	.85	1.5	.92
Innovating	.87	1.5	.91
Disengagement	.93	3.4	.95
Deceleration	.76	2.0	.81
Retirement Planning	.91	1.6	.92
Retirement Living	.95	1.4	.95

Note: Permission given by Super (1988)  
(See appendix C)

the three exploration subscales, crystallization, specification, and implementation,

and on the stabilizing subscale of the establishment Stage ( $p < .05$ ). Super (1987) suggested that these results may reflect the fact that a majority of the women in the sample tended to be at lower job levels than the men. He also observed that the current trends among women with respect to overt concerns regarding occupational status and pursuits may have influenced these recent findings.

In addition to the career concerns measures, the ACCI also gathers data regarding job satisfaction (three-items), and career change status (one-item).

Permission was requested and granted by the Consulting Psychologist Press, Inc. (1987) for the researcher to incorporate the current ACCI questions onto the mail survey to be used in this study (Appendix B). Modifications of the current format were made to emulate that of the Career Concerns Inventory--Adult Form (Super, Zelkowitz, & Thompson, 1981), which most closely resembles the format adopted for the other sections of the questionnaire.

### **Pilot Study**

Prior to its use in this investigation, the alumni questionnaire (Appendix C) was administered to all liberal arts and science Virginia Tech graduates who completed their bachelors degree requirements in Winter of 1986 (N =79). The purpose of this pretest effort was to determine the length of time it takes to complete the instrument and to solicit participant comments and questions regarding the clarity of its instructions, items, sequence, and format.

The response rate of the pilot study was 21.5 percent. This response generated a concern regarding the clarity of instruction and the ease of which to complete the survey. Several colleagues were asked to fill in the questionnaire and provide suggestions for improvement. As a result of this effort, a number of errors were corrected, the format was altered, and refinements were made. Specifically, the most substantial change was made to Section II-- Student Involvement in Out-of-Class Activities, the format of which was altered to appear less overwhelming in the final version of the alumni survey (Appendix D).

### Variable Specifications

The following section will present the predictor (independent) variables (student involvement and background data), the criterion (dependent) variables (job satisfaction, career stability, occupational mobility, and career development status) and the means by which they were measured.

Student Involvement. Student involvement in out-of-class activities was measured by combining both Astin's (1983) and Super's (1982) notions of this construct. Astin regarded involvement as the quality and quantity of time devoted to a task. Super, on the other hand, viewed involvement as participation (action) combined with commitment (emotional attachment).

For this section of the questionnaire, alumni were instructed to consider their involvement in out-of-class experiences during their junior and senior years in college. This period of time was chosen to represent an overall profile of the level of student activity on- and off-campus during the entire college experience.

Graduates were first asked to indicate their participation (quantity) in listed activities, programs, work experiences, and organizations. For the educational and paid work

experience subsections, subjects checked "yes" or "no" to designate whether they participated in activities such as internships for credit, appointments with career or placement counselors or advisors, career assessment inventories, ROTC Program, student teaching, cooperative education, summer jobs, Work-Study positions, and internships.

Assigned participation weight values were determined for each education and work item based on the estimated number of hours per week or per academic term and divided by a 30 week academic year. For example, the typical number of on-the-job hours required for 6 internship credit hours was 180. When divided by 30 (academic weeks per academic year) the internship for credit weight equaled 6. Similarly, those engaged in a full-time summer job would have devoted 40 hours a week to that job. Forty hours times 12 weeks equaled 480 hours of work during the summer. Four hundred and eighty hours divided by 30 academic weeks equaled a weight of 16. Tables 3 and 4 illustrate the weights associated with each listed educational and work experience, respectively.

For the third activities section, alumni were asked to consider the average number of hours per week they participated in on- and off-campus leisure/extracurricular activities. The following five-point scale was employed: a = none, b = less than one hour per week,

**Table 3**

Weighted Values for Educational Activities

Activity	Hours per Week	X	Number of Weeks	=	Hours per Unit	Weighted Value
Practicum or Internship for credit					180/QTR	6
Student Teaching	30		10		300 QTR	10
ROTC Program	7 168		30 4		210/AY 672/SUM 882/CR	29.4
Met with counselor					2/AY	.06
Attended Workshop or seminar					2/AY	.06
Career assessment inventory					2/AY	.06
Career materials					5/AY	.16
Career computer programs					5/AY	.16

Note: QTR = Quarter  
 AY = Academic Year  
 SUM = Summer

Table 4

Weighted Values for Work Activities

Activity	Hours per Week	X	Number of Weeks	= Hours per Unit	Weighted Value
Paid internship during school year	10		30	300/AY	10
Part-time paid internship during summer	20		12	240/SUM	8
Full-time paid internship during summer	40		12	480/SUM	16
Cooperative education	40		20	800/AY	26.6
Work-Study position	12		30	360/AY	12
Part-time job during school year	20		12	240/SUM	8
Full-time job during summer	40		12	480/SUM	16
Full-time job during school year (other than Coop)	40		30	1200/AY	40
Part-time job during school year (other than Work-Study)	10		30	300/AY	10

Note: QTR = Quarter  
 AY = Academic Year  
 SUM = Summer  
 CR = Calendar Year

c = 1 - 5 hours per week, d = 6 - 10 hours per week, and e = over 10 hours per week. Weights were also determined for each of these categories by the average number of hours: a = 0, b = .5, c = 3, d = 8, e = 15.

Secondly, if respondents indicated participation in specific educational, work, leisure activities they were asked to designate the extent to which they were committed (quality) to those activities. For the purpose of communicating a clear definition of commitment, the term "importance" was used. The alumni were asked to consider the level of importance they attributed to these activities while using a five-point Likert scale: 1 = "of no importance" to 5 = "of great importance."

A cumulative student involvement (SI) score was determined for each subcategory: educational activities, work activities, and leisure/extracurricular activities. This was accomplished by multiplying the weighted participation score (P) for each experience by the importance score (I):

$$SI = P \times I.$$

Background Data. Four background variables were measured. Socioeconomic status was determined by parental educational status. Respondents indicated their parents' levels of education based on the following five categories: "less than

a high school degree," "high school degree," "some college," "bachelor's degree," and "graduate work or degree."

Participant gender was requested, male (0) and female (1), in addition to their college quality credit average (QCA) upon graduation. QCA represented the respondent's academic ability and was reported within the following scheme:

3.50 - 4.00, 3.00 - 3.49, 2.50 - 2.99, and 2.00 - 2.49.

Alumni college majors were assigned to one of four categories designated by the College of Arts and Sciences: humanities, social studies, math sciences, or natural sciences.

Graduates who reported two majors from different categories were classified accordingly and were considered twice, under different major fields, for data analyses that required major as an independent variable.

Career Satisfaction. Three job satisfaction items appeared on the ACCI and were used to generate three separate job satisfaction scores. Four point satisfaction scales, "very satisfied" = 4, "satisfied" =3, "somewhat dissatisfied" = 2, and "dissatisfied" =1, were provided for individuals to assess their overall career progress to date, present employment, and their future career prospects.

Career Stability. A single item on the ACCI, entitled the Career Change Status, was used to produce the career stability score. This construct was based on the extent to which the respondent expected to continue in his or her present career or whether he or she actually changed to a new occupational field since graduation (Richards, 1984b). Subjects selected the best of five sentences that described their current career situation: (1) I am not considering making a career change, (2) I am considering making a career change, (3) I plan to make a career change and am choosing a field to move to, (4) I have selected a new field and am trying to get started in it, or (5) I have recently made a career change and am settling down in the new field.

Career Development Status. Subject's career development status was determined by scores produced on the Adult Career Concerns Inventory (Super, Thompson, & Lindeman, 1985). Respondents were instructed to rate 45 career issues according to extent of their personal concern. A rating of 1 ("no concern") indicated that the issue was either not yet a concern or was no longer a concern, while a rating of 5 ("great concern") indicated that the issue was dominant, producing a high level of concern.

An example of a career development profile is illustrated in Table 5 and reports independently weighted sum averages

**Table 5**

Profile of Career Development Status

Career Stages	Item Numbers	Number of Concerns Rated					Average Substage Sum/5	Rating Stage Sum/3
		1	2	3	4	5		
<b>EXPLORATION</b>							<b>4.6</b>	
	Crystalization	1-5				5	5	
	Specification	6-10		1		4	4.6	
	Implementation	11-15		2		3	4.2	
<b>ESTABLISHMENT</b>							<b>3</b>	
	Stabilizing	16-20	2	2	1		2.8	
	Consolidating	21-25	1		1	3	4.2	
	Advancement	26-30	5				2	
<b>MAINTENANCE</b>							<b>4.3</b>	
	Holding	31-35		2		3	4.2	
	Updating	36-40		1		4	4.6	
	Innovation	41-45		1	2	2	4.2	
<b>DISENGAGEMENT</b>							<b>3.8</b>	
	Decelerating	46-50	1			4	3.6	
	Retirement Plans	51-55				5	4	
	Retirement Living	56-60				5	4	

calculated for the nine substages. Higher scores indicate that respondents display greater levels of concern for specific vocational tasks than lower scores.

The initial intention of this study was to determine individual career development status by way of calculating Career Task Index scores. These scores were to be reflective of the career development continuum, thus each of the nine vocational task (subscale) scores were to be assigned a weighted value according to its level of progression in the career development scheme: crystallization = 1, specification = 2, implementation = 3, stabilization = 4, consolidation = 5, advancing = 6, holding = 7, updating = 8, and innovation = 9. Respondent scores for each subscale were to be multiplied by the weighted value and summed, producing the Career Task Index score.

Upon coding the survey, it was observed that a large number of alumni yielded rather flat profiles in their evaluation of career concerns. Those who reported high levels of concern for exploration tasks tended to give high ratings to subsequent items. Conversely, those who showed low levels of concern for initial task statements tended to indicate little or no concern with higher level career statements. Had the original plan been incorporated, the high Career Task Index scores would not have merely indicated higher levels

of career concerns among the 45 career issue statements, not a progression of increase as originally intended.

Significantly high Pearson Product correlations, appearing in Table 6, confirmed the observations that individuals tended to have consistently high, medium, or low levels of concern throughout the 45 career statements. This finding established the need for additional preliminary analyses in order to evaluate the potential for collinearity and multicolliniarty among career development tasks.

The VARIMAX rotated factor analysis technique served to demonstrate a factor solution of three sets of loading patterns with eigenvalues over one. The three factors illustrated in Table 7 represent 74.7 percent of the variance among the nine career tasks. Interestingly, the results of this analysis generated task grouping similar to Super's theoretical model, with a couple of exceptions.

Four career tasks loaded significantly on the first extracted factor: stabilizing, consolidating, advancing, and holding. An eigenvalue of 3.02 indicated 33.4 percent of relative importance of this factor in accounting for the variance associated with the set of variables. Super's theory maintains that the first three mentioned tasks are included

**Table 6**

Pearson Correlation Coefficients Between Career Tasks (N = 229)

Tasks	1	2	3	4	5	6	7	8	9
X1 Crystallization	1.00	.79	.71	.30	.11	.16	.19	.13	.29
X2 Specification		1.00	.73	.40	.25	.30	.26	.26	.42
X3 Implementation			1.00	.43	.25	.28	.26	.27	.41
X4 Stabilizing				1.00	.68	.63	.69	.56	.54
X5 Consolidating					1.00	.82	.73	.57	.58
X6 Advancing						1.00	.75	.60	.64
X7 Holding							1.00	.66	.61
X8 Updating								1.00	.73
X9 Innovating									1.00

**Table 7****(VARIMAX) Rotated Component Factor Analysis of Career Tasks**

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Tasks	Factors		
	1	2	3
X1 Crystallization	.04	<u>.88</u>	.04
X2 Specification	.16	<u>.87</u>	.14
X3 Implementation	.17	<u>.79</u>	.15
X4 Stabilizing	<u>.68</u>	.30	.25
X5 Consolidating	<u>.88</u>	.08	.21
X6 Advancing	<u>.83</u>	.13	.30
X7 Holding	<u>.75</u>	.11	.38
X8 Updating	.47	.10	<u>.69</u>
X9 Innovating	.46	.28	<u>.67</u>
Eigenvalue	3.01	2.39	1.33
Percentage of Trace	33.44	26.55	14.77

---

in the establishment stage, yet his theory classifies the holding tasks as the first within the maintenance stage.

The second factor was significantly loaded with the following tasks: crystallization (.88), specification (.87), and implementation (.79). These tasks were in keeping with Super's theoretical model for the exploration stage and generated an engenvalue of 2.39, explaining 26.5 percent of the variance among variables.

The third and last factor revealed yet another set of significant tasks which explained 14.7 percent of the variance among all variable (eigenvalue = 1.33): updating (.69) and innovating (.67). According to Super these career tasks are the last of three in the maintenance stage.

The results from the factor analysis made it necessary to regroup tasks for subsequent statistical analyses. To summarize, the following combinations were considered:

C1 = Crystallization  
Specification  
Implementation

C2 = Stabilizing  
Consolidating  
Advancing  
Holding

C3 = Updating  
Innovating

Considering the fact that student career development status profiles appeared to be flat, it became necessary to the development of a means by which to assess the degree to which and the direction of differences that existed among C1, C2, and C3. Proportional differences between career task categories (Differential Career Status Score--DCSS) were therefore calculated: Step 1- subtract the first from the second group mean and divide it by the first mean, Step 2- subtract the second from the third group mean and divide it by the second mean, Step 3- add the proportional scores together to produce the career development change produce a career development change score. For example:  $(C2 - C1 / C1) + (C3 - C2 / C2) = DCSS$ . This technique would generate a single proportional change score for each subject and would indicate the direction of the slope according to whether the individual proportionately increased or decreased scores for career development status.

## Research Plan

### Preparation for Data Collection

The following steps were taken to ensure orderly collection of the data. First, a master list of all Liberal Arts and Science graduates who completed their degree requirements in Spring of 1986 was generated by merging the student data base from Virginia Tech's Office of Institutional Research and the address list from the Alumni Association. Second, subject identification codes were assigned and recorded on corresponding questionnaires. This effort was made for the purpose of identifying respondents and sending subsequent mailings to nonrespondents. In addition, identification codes would allow response and nonresponse bias analyses and final data analyses to be conducted based on demographics factors.

Third, a receipt control system was established for returned surveys. This system provided a vehicle by which the researcher was able to identify systematic problems, log return rates, and estimate early and late response bias.

Upon receipt, all returned questionnaires were dated and logged onto the return rate graph; daily numbers were entered and cumulative percentages were generated. All questionnaires were checked for complete and error free responses. A systematic problem was identified in the first

set of returned surveys, specifically, a number of graduates failed to turn the questionnaire to the back page. Section III of the questionnaires was therefore incomplete and no data could be generated on the career development status variable. Two steps were taken to remedy this problem. First, all those who supplied incomplete information were sent a follow-up letter and a copy of part III with a request to complete and return the information. Second, follow-up surveys were all stamped with the instruction to "Please turn to the back page."

#### **Questionnaire Distribution Plan**

Each subject was mailed a survey packet consisting of the following:

1. An envelope, in which the questionnaire was mailed to all members of the population;
2. A cover letter, explaining the purpose of this study, the importance that each alumnus and alumna participate in the study, and the anonymity of the individual responses; and
3. A survey instrument, in the form of a pamphlet and a self addressed, stamped envelope, for easy completion and return (See Appendix D).

All mailings were sent first-class to ensure that surveys would be forwarded. Properly timed follow-up mailings were disseminated to provide additional stimuli for responses.

A questionnaire distribution plan was developed in accordance with Dillman's (1978) general recommendations (pp. 180 - 190) (Refer to Appendix A); yet, contrary to popular recommendation, surveys were distributed around the Thanksgiving and Christmas seasons. This measure was taken for the benefit of those alumni whose parents' addresses appear on the master list. The intention was for parents to either forward the survey packets or hold them for their son's or daughter's arrival during the holidays. The likelihood of alumni obtaining and completing the questionnaire during the holiday seasons, when compared to other times of the year, was hopefully increased.

The first mailing was sent on Monday, November 9 (Day 1). Eleven days later, Friday, November 20, a follow-up post card was sent to those who had not responded to the initial mailing (Day 12) (See Appendix E). On Monday, December 7 the second questionnaire and cover letter were disseminated to those who had not completed and returned the first (Day 29).

## **Data Analysis**

Upon receipt, raw data from each questionnaire was coded and entered onto an established Statistical Analysis System (SAS) data file next to predetermined identification numbers. The survey code book is located in Appendix F. Statistical analyses were performed to determine response rates, population characteristics, non-respondent characteristics, and relationships between dependent and independent variables.

Based on reported data, response rates and population characteristics were assessed. To determine response rates, percentages were computed for those who completed and returned the questionnaire. These data did not include nondelivered packets. A description of respondent characteristics was determined by generating statistical frequencies and percentages on background variables: college major, socioeconomic status, academic ability, and gender.

Two procedures were used to identify whether a nonresponse bias was significant to this study. First, chi-squares were used to determine whether or not there were differences between those who responded and those who did not. Data used for comparisons (gender, grade point average, and major) were accessed through the Virginia Tech Office of Institutional Research student data base. Second, based on the observation

that nonrespondants closely resemble late respondents (Donald, 1960; Muffo & Whipple, 1982), chi-square analyses were used to compare those who responded to the first mailing (first, second, and third weeks of the study) to those who responded after the second and third mailings (fourth through ninth weeks).

In addition to examining descriptive population data, step-wise multiple regression analyses were computed to answer the following established research questions:

1. What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure activities) and career satisfaction?
2. What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure activities) and career stability?
3. What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure activities) and post-college status of career development?

To maximize the measurement of the degree to which relationships existed between student involvement in

out-of-class activities and the four criterion variables, the following predictor variables were also be considered: demographic data (DEMO)--gender and socio-economic status, academic ability (QCA), and college major (MAJ).

Multiple regression analyses were performed to examine whether student involvement, along with other background and experiential variables, would serve to predict statistical significance among the criterion variables: job satisfaction (SAT), career stability (STAB), and career development status (STAT). Specifically, the development of stepwise regression models determined the sequence of predictors in order of strongest relationship with the criterion variables.

$$\text{SAT} = b_0 + (\text{SI})b_1 + (\text{DEMO})b_2 + (\text{AA})b_3 + (\text{MAJ})b_4$$

$$\text{STAB} = b_0 + (\text{SI})b_1 + (\text{DEMO})b_2 + (\text{AA})b_3 + (\text{MAJ})b_4$$

$$\text{STAT} = b_0 + (\text{SI})b_1 + (\text{DEMO})b_2 + (\text{AA})b_3 + (\text{MAJ})b_4$$

The exploratory nature of this study allowed for the acceptance of an alpha level of .10 for statistical analyses. Justification for this decision was based on the need for a closer look at involvement as a possible function of career exploration and decision making. Variables associated with satisfaction, career stability, and career development status would therefore be considered significant if falling below the .10 level.

## CHAPTER IV

### RESULTS OF STUDY

This chapter includes the results of the study and contains five major sections: (a) demographic profile of the respondents, (b) non-respondent analyses, (c) student participation in out-of-class experiences, (d) student involvement in out-of-class experiences and (e) aspects of the initial work period, including current employment status, three dimensions of career satisfaction, career stability, occupational mobility, and career development status.

#### **Demographic Profile of Respondents**

The population used for this alumni follow-up study was 477 Liberal Arts and Sciences bachelor's degree recipients in the Spring of 1986 who indicated that they did not intend to continue their education on a full-time basis upon graduation and for whom the Virginia Tech Alumni Association had current addresses. Of the 477 mailed survey packets, seven were not delivered due to inaccurate addresses; therefore, the total number of possible responses was 470 (See Table 8). Two hundred and fifty nine surveys were returned, yet after close examination 25 surveys were eliminated from this study because 20 subjects were full-time graduate students and five were full-time homemakers. Two hundred and thirty four

Table 8

Number of Spring 1986 Arts and Sciences Survey Results by Major

Division/Major	Mailing List N = 477	Deliverables N = 470	Returns N = 259	Usable Data N = 234
<b>Humanities</b>				
Art	8	8	3	3
English	27	26	15	13
French	-	-	-	-
German	-	-	-	-
I S	8	8	4	4
LA & S	15	14	7	6
Music	3	2	1	-
Philosophy	1	1	1	1
Spanish	8	8	4	4
Theatre Arts	1	1	1	1
Total	71	68	36	32
<b>Social Studies</b>				
Communications	84	83	50	46
Economics	8	7	5	5
History	26	26	12	12
Political Science	39	39	18	16
Psychology	25	25	14	11
Sociology	11	11	5	5
Urban Affairs	4	4	2	2
Total	197	195	106	97
<b>Natural Sciences</b>				
Biochemistry	14	13	7	4
Biology	46	45	22	19
Chemistry	13	13	10	8
Geography	9	9	4	4
Geology	5	5	2	1
Geophysics	2	2	1	1
Nuclear Science	5	5	3	3
Physics	8	7	4	4
Total	102	99	53	44
<b>Math Sciences</b>				
Computer Science	72	72	47	47
Mathematics Ed.	1	1	1	1
Mathematics	30	30	15	12
Statistics	4	4	1	1
Total	107	108	64	61

Note: I S = International Studies  
 LA & S = Liberal Arts and Sciences  
 Ed = Education

respondents were therefore considered for the analyses so that the response rate of usable questionnaires was 52.6 percent of those who could be contacted and were eligible to participate.

It is important to note that eight individuals had double college majors in two different major fields (humanities, social studies, natural sciences, or math science). Two hundred and forty two data sets were therefore used in the instances where analyses were examining respondents' college majors.

From among the 234 respondents, 51.7 percent were female alumnae. Respondent socioeconomic backgrounds were determined by parent educational backgrounds. The majority of fathers had completed a bachelor's degree or had completed some graduate work or a graduate degree (n= 146, 62.9%), while the greatest concentration of mothers held only a high school diploma (n=79, 33.9%) (See Table 9).

Academic backgrounds reported by liberal arts and sciences alumni revealed that approximately three quarters graduated with a quality credit average (QCA) between 2.50 and 3.49 and a little over 20 percent between 2.00 and 2.49, whereas the least number of subjects (30.6%, n=14) reported a QCA of 3.50 to 4.00. Table 10 reports a relatively even distribution

**Table 9**

Frequencies and Percentages for Parents' Education Backgrounds

---

Parent Educational Background	F	%
<b>Father</b>		
Less than high school degree	9	3.9
High school degree	43	18.5
Some college	34	14.7
Bachelor's degree	71	30.6
Graduate work or degree	75	32.3
Total	232	
Missing	2	
<b>Mother</b>		
Less than high school degree	6	2.6
High school degree	79	33.9
Some college	57	24.5
Bachelor's degree	54	23.2
Graduate work or degree	37	15.9
Total	233	
Missing	1	

---

**Table 10**

Frequencies and Percentages for Academic Variables

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Academic Variables	F	%
QCA		
2.00 - 2.49	50	21.4
2.50 - 2.99	97	41.5
3.00 - 3.49	73	31.2
3.50 - 4.00	14	6.0
Total	234	
MAJOR*		
Humanities	35	14.5
Social Studies	99	40.9
Natural Sciences	45	18.6
Math Science	63	26.0
Total	242	

---

Note: \* double majors included

among majors, with a healthy representation of social studies (40.9%) and math sciences (26.0%) majors.

A closer look at the educational compositions of the respondents demonstrated significant differences of QCAs by major (chi-square = 21.88,  $p < .01$ ) (Table 11). Noteworthy are the facts that none of the humanities majors reported having a 3.49 to 4.00 QCA and the largest overall number of alumni in any category was evidenced by social studies majors within the 2.50 - 2.99 QCA range ( $n=47$ , 19%), while natural and math science majors demonstrated an even distribution among QCA levels.

#### **Non-Respondent Analyses**

For the purpose of examining potential response bias, chi-square analyses were conducted on selected background variables available through the Virginia Tech's Office of Institutional Research student data base. Chi-square differences were explored between demographic characteristics (major, QCA, and gender) of those who responded and those who did not respond to the alumni follow-up questionnaire.

While no significant differences existed between the two groups based on major and gender, there was a difference found concerning the QCA (chi-square = 10.81,  $p < .05$ ). The

Table 11

Frequencies and Percentages of Quality Credit Average by Major

Major	Quality Credit Average				Total
	2.00- 2.49	2.50- 2.99	3.00- 3.49	3.50- 4.00	
<b>Humanities</b>					
F	9	12	14	0	35
%	3.72	4.96	5.79	0.00	14.46%
Row %	25.71	34.29	40.00	0.00	
Col %	17.65	11.88	18.42	0.00	
<b>Social Sciences</b>					
F	26	47	21	5	99
%	10.74	19.42	8.68	2.07	40.91%
Row %	26.26	47.47	21.21	5.05	
Col %	50.98	46.53	27.63	35.71	
<b>Natural Sciences</b>					
F	12	16	15	2	45
%	4.96	6.61	6.20	0.83	18.60%
Row %	26.67	35.56	33.33	4.44	
Col %	23.53	15.84	19.74	14.29	
<b>Math Sciences</b>					
F	4	26	26	7	63
%	1.65	10.74	10.74	2.89	26.03%
Row %	6.35	41.27	41.27	11.11	
Col %	7.84	25.74	34.21	50.00	
Column	51	101	76	14	242
Total	21.07%	41.74%	31.40%	5.79%	100.00%

Note:  $\chi^2 = 21.88$  with 9df,  $p < .01$

level of academic performance proved to be higher among respondents than for non-respondents. Perhaps this is indicative of differing levels of motivation, effort, or ability (See Table 12).

An additional measure was conducted to detect whether the demographics of non-respondents could be estimated. Based on the observation that late respondents more closely represented non-respondents

than did early respondents (Donald, 1960; Muffo & Whipple, 1982), the chi-square technique was applied to selected factors of those who responded as a result of the first mailing (weeks 1 through 3) and those who responded to subsequent mailings (weeks 4 through 9). (Table 13 reports the number of respondents for each week of the study.) There were no significant differences between early and late respondents among background variables, such as gender, father's and mother's educational background; academic factors, such as major and QCA; or employment factors, such as employment status (whether or not employed) and number of positions held since graduation.

When comparing selected factors for respondents and non-respondents and for early and late respondents, there is no reason to believe that those who responded to the study

Table 12

Frequencies and Percentages of QCA by Respondent Status

QCA	Respondent Status		
	Nonrespondents	Respondents	Total
2.00 - 2.49			
F	92	72	164
%	19.29	15.09	34.38%
Row %	56.10	43.90	
Col %	42.01	27.91	
2.50 - 2.99			
F	68	106	174
%	14.26	22.22	36.48%
Row %	39.08	60.92	
Col %	31.05	41.09	
3.00 - 2.49			
F	47	63	110
%	9.85	13.21	23.06%
Row %	42.73	57.27	
Col %	21.46	24.42	
3.50 - 4.00			
F	12	17	29
%	2.52	3.56	6.08%
Row %	41.38	58.62	
Col %	5.48	6.59	
Column Total	219	258	477
Total	45.91	54.09	100.00

Note:  $X^2 = 10.81$  with 3df,  $p < .05$

**Table 13**

Frequencies and Percentages by Week of Return

---

Week	F	%	Cumulative F	Cumulative %
1	9	3.8	9	3.8
2	95	40.6	104	44.4
3	31	13.2	135	57.7
4	22	9.4	157	67.1
5	17	7.3	174	74.4
6	17	7.3	191	81.6
7	29	12.4	220	94.0
8	8	3.4	228	97.4
9	6	2.6	234	100.0

---

were not representative of the other Spring 1986 Liberal Arts and Sciences bachelor's degree recipients, with the exception of QCA.

#### **Student Participation in Out-of-Class Activities**

Arts and sciences alumni were asked to indicate whether they participated in specified educational, paid work, and leisure experiences. Tables 14, 15, and 16 provide frequency and percentage frequencies for each activity.

From a quarter to over half of the respondents took advantage of career-related educational resources or experiences such as meeting with a career or academic advisor(s) (55.8%), referring to written materials (50.4%), attending seminar(s) or workshop(s) (44.2%), completing assessment inventory (34.5%), or enrolling in practicum or internship for academic credit (25.2%) (See Table 14). On the other hand, less than ten percent participated in the ROTC Program, used the computer programs to assist with their career decision making, or were student teachers while in college.

When reporting employment activity during college, the largest percents of subjects were employed during the summer on a full-time basis (72.2%, n=175) and 44.2 percent (n=107) had part-time jobs during the school year in non-Work-Study positions (See Table 15). Interestingly, 25.2 percent of the

Table 14

Frequencies and Percentages of Participation in Educational Activities

Activity	F	%
Practicum/internship for credit		
no	181	74.8
yes	61	25.2
Student teaching		
no	226	93.4
yes	16	6.6
ROTC Program		
no	218	90.1
yes	24	9.9
Met with counselor		
no	107	44.2
yes	135	55.8
Attended workshop or seminar		
no	13	55.8
yes	107	44.2
Career assessment inventory		
no	158	65.3
yes	84	34.7
Career materials		
no	120	49.6
yes	122	50.4
Career computer programs		
no	221	91.3
yes	21	8.7

**Table 15**

Frequencies and Percentages of Participation in Paid Work Experiences

Activity	F	%
Paid internship during school year		
no	229	94.6
yes	13	5.4
Part-time paid internship during summer		
no	233	96.3
yes	9	3.7
Full-time paid internship during summer		
no	222	91.7
yes	20	8.3
Cooperative Education		
no	229	94.6
yes	13	5.4
Work-Study position		
no	212	87.6
yes	30	12.4
Full-time job during summer		
no	67	27.7
yes	175	72.3
Part-time job during summer		
no	174	71.9
yes	68	28.1
Full-time job during school year (other than Coop)		
no	229	94.6
yes	13	5.4
Part-time job during school year (other than Work-Study)		
no	135	55.8
yes	104	44.2

alumni indicated that they obtained academic credit for an internship (Refer to Table 14), yet, less than nine percent held paid internship positions during the school year, were employed in part-time paid internships during the summer, or held a full-time paid summer internships (See Table 15).

Few Liberal Arts and Sciences majors were employed on a full-time basis during the school year. Only 13 former students (5.4 %) were enrolled in the Cooperative Education Program, while the same number were employed in full-time positions other than co-op positions.

From one quarter to a half of the subjects reported engagement in on-campus leisure activities such as intramural or club sports (52.9%) and memberships in academic clubs (34.3%) social organizations (30.6), and professional societies (24.4%). Fewer associated with religious campus organizations (19.8%), service organizations (17.8%), intercollegiate athletics (8.7%), and residence hall council (4.5%) (See Table 16).

With respect to off-campus leisure activities, 38.4 percent indicated they were active with a hobby or interest area, 19.4 percent were involved in a church organization, 12 percent volunteered with a service program, while only eight

Table 16

Frequencies and Percentages of Participation in On-Campus  
Leisure/Volunteer Activities

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Academic	F	%
Service Organizations		
no	199	82.2
yes	43	17.8
Social Organizations		
no	168	69.4
yes	74	30.6
Religious Organizations		
no	194	80.2
yes	48	19.8
Academic Club		
no	159	65.7
yes	83	34.3
Professional Society		
no	183	75.6
yes	59	24.4
Intramural or Club Sports		
no	114	47.1
yes	128	52.9
Intercollegiate Athletics		
no	221	91.3
yes	21	8.7
no	231	95.5
yes	11	4.5

---

individuals (3.3%) were members of civic organizations (Table 17).

Three-way factorial analyses were conducted to identify whether background variables, such as gender, major, and QCA, were associated with the differences between participants and non-participants in out-of-class educational, work, or leisure activities. As reported by Table 18, gender and college major main effects proved to be statistically significant for participation in educational activities ( $p < .01$ ). The examination of mean scores indicated that women, more so than men, participated in educational activities, while math science majors tended not to participate when compared to those from other majors.

Both gender and QCA main effects were significantly associated with participation in paid work experiences ( $p < .10$ ) (See Table 19). Again, female liberal arts and sciences graduates tended to be employed during college more so than their male counterparts, as were those with low QCAs (2.00 to 2.49). On the other hand, the analysis of variance calculated for leisure activity participation yielded no significant differences among background factors.

Table 17

Frequencies and Percentages of Participation in Off-Campus  
Leisure/Volunteer Activities

---

Activity	F	%
Civic Organizations		
no	234	96.7
yes	8	3.3
Church Organizations		
no	195	80.6
yes	47	19.4
Volunteer with Service Program		
no	213	88.0
yes	29	12.0
Active with hobby or interest area		
no	149	61.6
yes	93	38.4

---

Table 18

Analysis of Variance for Student Participation in Educational Activities

---

Source	df	Sum of Squares	Means Square	F Value	p
Gender	1	18.33	18.33	7.12	< .01
Major	3	37.96	12.65	4.92	< .01
QCA	3	5.80	1.93	.75	N.S.
Error	234	602.43	2.57		

---

Table 19

Analysis of Variance for Student Participation in Work Activities

---

Source	df	Sum of Squares	Means Square	F Value	p
Gender	1	5.52	5.52	3.76	< .01
Major	3	2.21	.73	.05	N.S.
QCA	3	10.10	3.36	2.29	< .01
Error	234	343.45	1.46		

---

### **Student Involvement in Out-of-Class Activities**

Student involvement in out-of-class activities was measured by weighted participation scores multiplied by the extent to which the alumni felt the activities were important at the time of participation (5 point scale; 1= "no importance" to 5= "great importance"). For example, a graduate who checked participation in student teaching may have given it a rating of one because this required experience may not have been relevant to his or her actual future goals, whereas another former student teacher may have found it extremely meaningful, therefore assigning a rating of five.

Student involvement score ranges, means, medians, and standard deviations are listed on Table 20. Specifically, educational involvement scores ranged from zero to 165.24 with a mean of 24.14, a median of 1.26, and a standard deviation of 40.53. Involvement scores for paid work experiences ranged from zero to 494 with a mean of 111.52, a median of 90, and a 82.51 standard deviation. A range from zero to 413.5 was calculated for on- and off-campus leisure involvement scores, with a mean of 83.33, a median of 77, and a standard deviation of 71.09. Scores for the sum of all activities (total involvement) ranged from zero to 547.48 with a mean of 216.58, a median of 203, and a standard deviation of 119.66. Vast discrepancies among individual scores for all activities categories were evident.

Table 20

Scores for Student Involvement

Area of Involvement	Score Range	Mean	Median	SD
Education	0 - 165.24	24.14	1.26	40.53
Work	0 - 494.00	111.52	90	82.51
Leisure	0 - 413.50	83.33	77	71.09
Total Involvement	0 - 547.48	216.58	203	119.66

Three five-way ANOVAs were generated with independent background variables (gender, major, QCA, father's and mother's educational backgrounds) for educational, work, and leisure involvement scores (dependent variables). Three main effects were generated for student involvement in educational activities (Table 21). First, gender yielded an F value of 10.44 at the .01 significance level. Interestingly, where men tended to participate less in educational activities (See Table 18), they rated educational activities at a higher level of importance than did the women. A partial explanation for this occurrence might be found in the fact that the majority of those enrolled in the ROTC program were male (91.7%). This educational activity was most heavily weighted by virtue of the hours spent during the calendar year, therefore producing higher involvement scores for that program, and consequently a higher overall educational involvement score.

Two other background variables, major ( $F=3.28$ ,  $p < .05$ ) and mother's educational background ( $F=2.02$ ,  $p < .10$ ) were also found to be significant regarding the degree of educational involvement among graduates. Those in the math science field tended to be less involved in educational opportunities, as was the case for those whose mothers' had lower levels of education.

Table 21

Analysis of Variance for Student Involvement in Educational Activities

Source	df	SS	MS	F Value	p
Gender	1	16211.20	16211.20	10.44	< .01
Major	3	15270.81	5090.27	3.28	< .05
QCA	3	1845.92	615.30	.40	N.S.
Father's Education	4	8383.92	2095.98	1.35	N.S.
Mother's Education	4	12565.16	3141.29	2.02	< .10
Error	223	34628.23	1552.82		

Student involvement in paid work experiences revealed significant main effects of college major ( $F=2.90$ ,  $p < .05$ ) and father's educational background ( $F=2.82$ ,  $p < .05$ ) (See Table 22). Significant mean score differences among college majors indicated that humanities and natural science majors yielded higher levels of work involvement. Likewise, those with fathers who had a high school education or less showed higher level of involvement.

Much like participation in leisure and volunteer activities, the ANOVA technique did not demonstrate any significant factors in explaining the variance among student involvement scores.

#### **Aspects of the Initial Work Period**

The initial research questions posed in this study were as follows: (1) What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure activities) and career satisfaction? (2) What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure activities) and career stability? and (3) What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure activities) and post-college status of career development? Due to the relatively high frequency of positions held since

Table 22

Analysis of Variance for Student Involvement in Work Activities

Source	df	SS	MS	F Value	p
Gender	1	4405.27	4405.27	.77	N.S.
Major	3	49594.53	16531.51	2.09	< .05
QCA	3	29066.63	9688.66	1.70	N.S.
Father's Education	4	64306.63	16076.65	2.82	< .05
Mother's Education	4	30082.63	7520.65	1.32	N.S.
Error	223	1272654.64	5706.97		

graduation, an additional element was incorporated into this study--that of occupational mobility. A fourth research question was therefore included--(4) What is the relationship between college study involvement in out-of-class experiences (educational, work, and leisure) and occupational mobility? Horizontal occupational mobility is defined as the number of jobs in which an individual is employed regardless of status levels (vertical mobility) (Miller & Form, 1964). Included as both a dependent and as an independent variable, occupational mobility was often employed as a post-graduation factor in the examination of predictor variables in multiple regression analyses and selected criterion variables. The following sections address the results of this study as they relate to these questions.

### **Employment Status**

Ninety five percent of the 1986 Liberal Arts and Sciences respondents included in the study were employed at the time of the study. Sixty percent of those unemployed were women. Interestingly, a significant chi-square was produced for the analysis of employment status by academic major ( $p < .01$ ); all humanities and math sciences majors were employed, while 90 percent of those unemployed majored in the social studies fields and the other 10 percent were natural science majors.

Those who were employed at the time of the survey were asked to report their current occupation. Appendix G provides a listing of those positions according to the major field of study. Double majors were included in this report as well.

### **Satisfaction**

The recipients of the alumni follow-up questionnaire were asked to evaluate their level of satisfaction for three aspects of their career: career progress since graduation, current employment situation, and future career prospects. A four-factor satisfaction scale was provided: "very satisfied" = 4, "satisfied" = 3, "somewhat dissatisfied" = 2, and "dissatisfied" = 1. For the purpose of examining variables that affected satisfaction, the following sections present results of descriptive and inferential statistical analyses.

Career Progress Since Graduation. Seventy eight alumni (34.5%) reported they were very satisfied with their career progress since graduation and ninety eight (43.4%) were satisfied. Overall, one hundred and seventy six alumni (77.9%) considered themselves in the satisfied categories (Table 23). Thirty two (14.2%) were somewhat dissatisfied, while 18 (8%) were dissatisfied-- producing a total of 22.2% in the dissatisfied categories.

Table 23

Frequency and Percentage for Career Progress Satisfaction

---

Level of Satisfaction	F	%
Very Satisfied	78	34.5
Satisfied	98	43.4
Somewhat Dissatisfied	32	14.2
Dissatisfied	18	8.0
Total	226	
Missing	8	

---

T-tests were employed to evaluate whether student participation in individually listed educational, work, and leisure activities contributed to graduates' levels of career progress satisfaction. Homogeneity of variances was tested, and the t-values were adjusted accordingly.

As illustrated in Table 24, no effects were associated with individual educational or work activities, yet two leisure activities influenced the mean satisfaction scores of those who participated and those who did not. Membership to a professional society, such as the Pre-Law Society, yielded a significantly higher mean score of 3.32, with a standard deviation of .94 ( $p < .01$ ). Consequently, those who participated in these kinds of organizations were significantly more satisfied than their non-participant counterparts. The one hundred and twenty four graduates who were active in intramural or clubs sports were likewise more satisfied than those who did not ( $M = 3.16$ ,  $SD = .84$ ,  $p < .05$ ).

In order to examine the potential influence of cumulative educational, work, and leisure student involvement scores on career progress satisfaction, step-wise regression models were developed. The proposed plan included five additional predictor variables: major, QCA, gender, and father's and mother's educational background. It became apparent after data collection that it would be advantageous to include an

**Table 24**

T-test Results for Activity Participation and Satisfaction  
in Career Progress

Activity	N	Mean	SD	SE	T	p
Professional Society						
no	177	2.97	.94	.07	-3.05	< .01
yes	57	3.32	.69	.09		
Intramural or Club Sports						
no	110	2.93	.94	.09	-2.02	< .05
yes	124	3.16	.84	.08		

Note: SD = Standard Deviation  
SE = Standard Error

additional factor-- the number of full-time positions held since graduation. While the other variables represent pre-graduation characteristics, the question was later posed as to whether more recent experiences, namely one's level of occupational mobility, would serve to help predict job satisfaction.

The regression analysis showed that the single most significant variable for predicting satisfaction with career progress was student involvement in leisure activities during the college years [ $F(1,229)=2.78, p < .10$ ]. This independent variable provided an explanation for one percent of the variation among satisfaction scores (Table 25). The addition of the number of positions held since graduation [ $F(2,228)=3.27, p < .10$ ] improved the prediction power by another percent; the coefficient of determination was two percent. The third and last significant factor to enter the equation was the involvement score for work activities [ $F(3,227)=3.14, p < .10$ ] ( $R\text{-Square} = .03$ ).

When excluding the number of jobs in which individuals were employed since Spring 1986 graduation, the step-wise regression model only included a single predictor variable--leisure activities [ $F(1,229)=2.78$ ]. The R-square of .01 was significant at the .10 level.

Table 25

Stepwise Multiple Regression Analysis for Satisfaction with Career Progress

Step	Variable	Regression Coefficient	F	df	R <sup>2</sup>	p
Including Number of Positions After Graduation						
1	Leisure Activities	-.251	2.78	1,229	.01	< .10
2	Number of Positions	.001	3.27	2,228	.02	< .10
3	Work Activities	.001	3.14	3,227	.03	< .10
	Intercept	3.168				
Excluding Number of Positions After Graduation						
1	Leisure Activities	.001	2.78	1,229	.01	< .10
	Intercept	2.93				
Including Total Student Involvement						
1	Total Involvement Score	.001	6.42	1,229	.02	< .05
	Intercept	2.784				

An additional regression analysis included a single student involvement score, which was the sum of the education, work, and leisure student involvement scores. As a result, the level of overall student involvement in out-of-class activities proved to be the only predictor of satisfaction in career progress [ $F(1,229) = 6.42, p < .05$ ]. R-square for this regression model was .02 (See Table 25).

Current Employment Situation. Thirty percent of the Arts and Sciences alumni from the class of 1986 were very satisfied with their current employment situation and 36.1 percent were satisfied (See Table 26). Notably, fewer individuals reported overall satisfaction with their current situation (66.9%) than with their career progress to date (77.9%).

Student participation in a number of specific educational, work, and leisure college activities affected satisfaction with the current job when using the t-test statistic (See Table 27). Having their more negative effects, both interactive career-related computer programs and membership in off-campus church organization were associated with lower levels of job satisfaction ( $M = 2.33, SD = 1.01, p < .05$  and  $M = 2.53, SD = 1.08, p < .05$  respectively) compared to mean satisfaction scores for those who did not participate. On the contrary, participation in part-time paid summer internship ( $M = 3.55, SD = .52$ ), professional societies ( $M = 3.07,$

Table 26

Frequency and Percentage for Current Employment Satisfaction

---

Level of Satisfaction	F	%
Very Satisfied	70	30.8
Satisfied	82	36.1
Somewhat Dissatisfied	46	20.3
Dissatisfied	29	12.8
Total	227	
Missing	7	

---

**Table 27**

T-test Results for Activity Participation and Satisfaction  
in Current Employment

Activity	N	Mean	SD	SE	T	p
<b>Career Related Computer Program</b>						
no	214	2.91	.98	.06	2.54	< .05
yes	21	2.33	1.11	.24		
<b>Part-time Paid Internship/summer</b>						
no	226	2.83	1.01	.07	-2.13	< .05
yes	9	3.55	.52	.18		
<b>Professional Society</b>						
no	177	2.80	1.03	.08	-2.09	< .05
yes	58	3.07	.81	.11		
<b>Intramural or Club Sports</b>						
no	110	2.68	1.07	.10	-2.57	< .05
yes	125	3.01	.91	.08		
<b>Church Organization</b>						
no	190	2.94	.97	.07	2.44	< .05
yes	45	2.53	1.08	.16		

Note: SD = Standard Deviation  
SE = Standard Error

SD=.81), and intramural or club sports (M=3.01, SD=.91) related to higher levels of satisfaction ( $p < .05$ ).

The step-wise multiple regression technique was incorporated to investigate the possible effect of predictive variables such as education, work and leisure student involvement scores, gender, QCA, father's and mother's educational backgrounds, major, and number of positions held after graduation, in regard to current job satisfaction. This model indicated that three variables collectively explained four percent of the variance among satisfaction scores (See Table 28). Much like the results for the career progress satisfaction criterion, the first two variables included involvement in leisure activities [ $F(1,230)=3.56, p < .10$ ] and the number of jobs over the past year and a half [ $F(2,229)=3.32, p < .10$ ]. The predictive power of these variables produced an R-square of .02. An increase of two percent was experienced with the addition of the third, and last, significant variable--QCA [ $F(3,228)=3.22, p < .10$ ] (R-square = .04).

The same set of variables, with the exclusion of number of positions, reported a slightly different compilation of predictor variables. In the absence of number of positions, college major entered as the second variable. In sequence of steps, involvement in leisure activities [ $F(1,230)=3.57,$

**Table 28**

Stepwise Multiple Regression Analysis for Satisfaction in Current Job

Step	Variable	Regression Coefficient	F	df	R <sup>2</sup>	p
<b>Including Number of Positions After Graduation</b>						
1	Leisure Activities	.001	3.56	1,230	.01	< .10
2	Number of Positions	-.263	3.32	2,229	.02	< .10
3	QCA	-.139	3.21	3,228	.04	< .10
	Intercept	3.406				
<b>Excluding Number of Positions After Graduation</b>						
1	Leisure Activities	.001	3.56	1,230	.01	< .10
2	Major	.134	2.76	2,229	.02	< .10
3	QCA	-.159	4.05	3,228	.04	< .05
	Intercept	2.707				
<b>Including Total Student Involvement Score</b>						
1	Total Involvement Score	.001	4.06	1,230	.01	< .05
2	Major	.138	2.96	2,229	.02	< .10
3	QCA	-.161	4.21	3,228	.04	< .05
	Intercept	2,595				

$p < .10$ ], college major [ $F(2,229)=2.76, p < .10$ ], and QCA [ $F(3,228), p < .05$ ] also produced an overall R-square of .04.

An additional regression analysis was generated to collapse the education, work, and leisure student involvement scores into a single, total student involvement score. Table 28 reports an R-square of .04 for three variables, the first of which was total involvement score [ $F(1,230)=4.05, p < .05$ ]. The second and third variables were major [ $F(2,229)=2.96, p < .10$ ] and QCA [ $F(3,228)=4.21, p < .05$ ].

Future Career Prospects. The highest percentage of very satisfied graduates was evidenced by alumni prospects for future career opportunities (39.1 %,  $n=88$ ) (See Table 29). A total of 80.9 percent ( $n=182$ ) were either very satisfied or satisfied with future career prospects.

T-test results of participation in all education, work, and leisure activities indicated that engagement in one work and two leisure activities related to significantly higher degrees of future career prospect satisfaction. (See Table 30). Specifically, paid internships during the school year ( $M= 3.69, SD= .48, p < .05$ ), participation in social organizations, such as sororities and fraternities, ( $M= 3.41, SD= .79, p < .01$ ), and participation in intramural or club sports ( $M= 3.30, SD= .74, p < .05$ ) each yielded higher mean

Table 29

Frequency and Percentage for Future Career Prospects

---

Level of Satisfaction	F	%
Very Satisfied	88	39.1
Satisfied	94	41.8
Somewhat Dissatisfied	38	16.9
Dissatisfied	5	2.2
Total	225	
Missing	9	

---

**Table 30**

T-test Results for Activity Participation and Satisfaction  
in Future Career Prospects

Activity	N	Mean	SD	SE	T	p
<b>Paid Internship/school year</b>						
no	220	3.15	.79	.05	-2.42	< .05
yes	13	3.69	.48	.13		
<b>Social Organization</b>						
no	163	3.09	.76	.06	-2.96	< .01
yes	70	3.41	.79	.09		
<b>Intramural or Club Sports</b>						
no	109	3.06	.81	.08	-2.38	< .05
yes	124	3.30	.74	.07		

Note: SD = Standard Deviation  
SE = Standard Error

satisfaction scores when compared to those of non-participants.

Step-wise multiple regression was employed to determine whether selected independent variables, including student involvement in educational, work, and leisure activities, QCA, major, father's and mother's educational background, gender and number of positions, would predict respondent's level of satisfaction with future career prospects. None of the independent variables served to explain differences among satisfaction scores at the .10 level of significance.

### **Career Stability**

Career stability was defined as the extent to which an individual intended to change career fields. Alumni were asked to check the best phrase to describe their career situation: (1) "I am not considering making a career change" = 1, (2) "I am considering a career change" = 2, (3) "I plan to make a career change and am choosing a field to change to" = 3, (4) "I have selected a new field and am trying to get started in it" = 4, and (5) "I have recently made a change and am settling down in the new field" = 5.

A little over a third of the respondents (39.6%, n=90) were not considering a career change one and a half years after graduation, yet, more individuals (43.2 %, n=99) were already

either considering or planning a career change, and 17.2 percent had selected a new field or were trying to get established in a new career field (See Table 31).

A 3 X 4 chi-square analysis was performed to compare three levels of stability with four college major fields. The original stability measures were summarized and collapsed into the following three classifications for this analysis: (a) no change (item 1), (b) considering or planning change (items 2 and 3), and (c) changed (items 4 and 5).

A significant chi-square (value = 19.42,  $p < .01$ ) illustrated that the majority of humanities majors (55.8%) and social studies majors (48.9%) were either considering or planning a career change (See Table 32). In contrast, 40 percent of natural science majors and 60 percent of the math science majors were not considering any career changes and were therefore classified as more stable.

The t-test statistical method produced significant findings with participation in five specific out-of-class college activities on stability scores (See Table 33). Alumni who were enrolled in the Cooperative Education Program at Virginia Tech were more stable than their non-Cooperative Education peers. Specifically, former co-op students were less likely to be considering a change ( $M = 1.58$ ,  $SD = .67$ ),

**Table 31**

Frequency and Percentage for Levels of Stability

---

Stability	F	%
Not considering a career change	90	39.6
Considering a career change	54	23.8
Planning a career change	44	19.4
Selected a new field and starting in it	22	9.7
Made a change and settling down in it	17	7.5
Total	227	
Missing	7	

---

**Table 32**

Frequencies and Percentages of Stability by Number of Positions

Major	Stability			Total
	No Change	Considering or Planning Change	Changed	
<b>Humanities</b>				
F	8	19	7	34
%	3.40	8.09	2.98	39.57%
Row %	23.53	55.88	20.59	
Col %	8.60	18.63	17.50	
<b>Social Studies</b>				
F	31	47	18	96
%	13.19	20.00	7.66	24.26%
Row %	32.29	48.96	18.75	
Col %	33.33	46.08	45.00	
<b>Natural Sciences</b>				
F	18	16	11	45
%	7.66	6.81	4.68	19.15%
Row %	40.00	35.56	24.44	
Col %	19.35	15.69	27.50	
<b>Math Sciences</b>				
F	36	20	4	60
%	15.32	8.51	1.70	25.53%
Row %	60.00	33.33	6.67	
Col %	38.71	19.61	10.00	
Column Total	93	102	40	235
Total	39.57	43.40	17.02	100.00

Note:  $\chi^2 = 19.49$  with 9df,  $p < .01$

**Table 33**

T-test Results for Activity Participation and Career Stability

Activity	N	Mean	SD	SE	T	p
<b>Met with Counselor</b>						
no	104	2.03	1.24	.12	-1.99	< .05
yes	131	2.36	1.28	.11		
<b>Career Related Materials</b>						
no	117	1.93	1.08	.09	-3.46	< .001
yes	118	2.49	1.38	.13		
<b>Cooperative Education Program</b>						
no	223	2.24	1.29	.09	3.14	< .01
yes	12	1.58	.67	.67		
<b>Intercollegiate Sports</b>						
no	216	2.15	1.22	.08	-2.66	< .01
yes	19	2.95	1.58	.36		
<b>Volunteer Service Program</b>						
no	209	2.12	1.24	.08	-3.07	< .01
yes	26	2.92	1.32	.26		

Note: SD = Standard Deviation  
SE = Standard Error

whereas non-participants were either planning a change or had already selected a new career field since graduation ( $M=2.24$ ,  $SD=1.29$ ). The difference in means scores was significant at the .01 level.

Interestingly, those who participated in the other four activities experienced a higher level of instability when compared to their non-participant counterparts. Alumni who played intercollegiate sports during their college years ( $n=19$ ) proved to be significantly less stable in their career situations than their peers ( $p < .01$ ). With a mean stability score of 2.95, former Virginia Tech athletes were considering a change or were planning to change to a new career field. Those who did not engage in intercollegiate sports produced a mean score of 2.24, which indicated that they were only considering a change. Similarly, twenty six former students were active in off-campus volunteer service programs, with a mean stability average of 2.92 and were less stable (higher tendency to plan career changes) than those who did not have this experience during college ( $M=2.12$ ,  $p < .01$ ).

Two educational experiences were also associated with less stable career paths. Those who met with counselors or advisors regarding career topics ( $M=2.36$ ,  $p < .05$ ) as well as those who used career-related materials ( $M=2.49$ ,  $p < .001$ ) had greater propensity to consider or plan changes than

those who did not take advantage of these resources during the career decision making process.

Step-wise multiple regression was also used to identify background factors (gender, QCA, major, father's and mother's educational backgrounds) and experiential factors (educational involvement, work involvement, leisure involvement and number of positions) that might predict levels of stability. Overall, five percent of the variance among stability scores were attributed to college major [ $F(1,230)= 11.14, p < .001$ ] and involvement in work activities during college [ $F(2,229)=2.94, p < .10$ ]. Major alone accounted for four percent, while a one percent incremental increase was produced with the addition of work activities (See Table 34).

An additional regression model was generated for the purpose of replacing individual student involvement scores for education, work, and leisure with a single, total involvement score. This process resulted with a single predictor variable, major ( $R\text{-square} = .04, p < .05$ ).

Table 34

Stepwise Multiple Regression Analysis for Career Stability

Step	Variable	Regression Coefficient	F	df	R <sup>2</sup>	p
Including Number of Positions After Graduation						
1	Major	-.26	11.14	1,230	.04	<.001
2	Work Activities	.001	2.94	2,229	.05	< .10
	Intercept	2.70				

### **Occupational Mobility**

It became apparent that an additional factor would be of importance to this study. Former students were asked to report the number of full-time positions they held since graduation. Unexpectedly, the average number of positions held over a one and a half year period of time was 1.84 with a standard deviation of .97 (See Table 35). One hundred and nine alumni held one full-time job since graduation (46.6 %), while 76 (32.5 %) held two jobs, 30 (12.8 %) held three jobs, 15 (6.4 %) held four jobs, and four (1.7%) held five jobs.

The 4 X 3 contingency table of majors and numbers of positions (one, two, and more than two) produced a 35.9 chi-square value ( $p < .0001$ ) (See Table 36). Humanities graduates experienced the highest level of occupational mobility--45.7 percent held more than two jobs at the time of the study. Otherwise, the highest concentrations of social studies, natural science, and math science majors held one job, 40.4 percent, 55.5 percent, and 68.2 percent, respectively--forming a nearly perfect continuum. The two majors with the fewest representatives in the "more than two positions" category were the natural science (11.7%) and math science (9.8%) graduates.

The examination of the number of full-time positions held since graduation and graduate gender did not produce a

**Table 35**

Number of Positions Held Since Graduation

---

Number of Positions	F	%
1	109	46.6
2	76	32.5
3	30	12.8
4	15	6.4
5	4	1.7

---

Note: Mean = 1.84  
Standard Deviation = .79

Table 36

Frequencies and Percentages of Number of Positions by Major

Number of Positions	Major				Total
	Hum	Social Studies	Natural Sciences	Math Sciences	
One					
F	5	40	25	43	113
%	2.07	16.53	10.33	17.77	46.69%
Row %	4.42	35.40	22.12	38.05	
Col %	14.29	40.40	55.56	68.25	
Two					
F	14	35	14	15	78
%	5.79	14.46	5.79	6.20	32.23%
Row %	17.95	44.87	17.95	19.23	
Col %	40.00	35.35	31.11	23.81	
More Than Two					
F	16	24	6	5	51
%	6.61	9.92	2.48	2.07	21.07%
Row %	31.37	47.06	11.76	9.80	
Col %	45.71	24.24	13.33	7.94	
Column Total	35	99	45	63	242
	14.46%	40.91%	18.60%	26.03%	100.00%

Note:  $X^2 = 35.09$  with 6df,  $p < .0001$   
 Hum = Humanities

significant chi-square. While men and women are equally represented in most categories, the greatest discrepancy was noted where a larger percentage of women held three positions (68.7%).

Engagement in five specific education, work, and leisure activities was associated with the number of jobs held after graduation, according to t-tests (See Table 37). It was surprising to discover that, with the exception of those in the ROTC Program, all significant experiences related to a higher number of positions after graduation. For example, those who attended career-related workshops were employed in an average of 2.01 jobs compared to those who did not with an average of 1.69 ( $p < .05$ ). Those who took advantage of career-related computer programs had an average of 2.07 jobs compared to 1.71 for non-users ( $p < .01$ ).

Employment in full-time jobs during the school year ( $M = 2.69$  versus 1.79), in part-time jobs during the school year ( $M = 1.99$  versus  $M = 1.71$ ), and membership with Residence Hall Council ( $M = 2.81$  versus  $M = 1.79$ ) revealed significantly higher levels of occupational mobility ( $p < .01$ ,  $.05$ , and  $.001$ , respectively). On the other hand, those enrolled in the ROTC Program during the undergraduate years were less mobile ( $M = 1.33$ ) than those who did not enroll in that program ( $M = 1.79$ ,  $p < .001$ ).

**Table 37**

T-test Results for Activity Participation and Number of Positions Held Since Graduation

Activity	N	Mean	SD	SE	T	p
ROTC Program						
no	218	1.89	1.00	.06	4.18	.0001
yes	24	1.33	.56	.11		
Career-Related Workshops						
no	135	1.69	.88	.07	-2.49	< .05
yes	107	2.01	1.08	.10		
Career-Related Computer Program						
no	158	1.71	.93	.07	-2.70	< .01
yes	84	2.07	1.05	.11		
Full-time Job/school year (not Cooperative Education)						
no	229	1.79	.97	.06	-3.27	< .01
yes	13	2.69	.85	.24		
Part-time Job/school year (not Work-Study)						
no	135	1.71	.89	.07	-2.09	< .05
yes	107	1.99	1.09	.10		
Residence Hall Council						
no	231	1.79	.95	.06	-3.44	< .001
yes	11	2.81	1.25	.38		

Note: SD = Standard Deviation  
SE = Standard Error

Two step-wise multiple regression models were developed to study the relationship between background and experience predictor variables and occupational mobility. The first included independent variables such as gender, QCA, major, father's and mother's educational backgrounds, educational involvement scores, work involvement scores, and leisure involvement scores. As illustrated by Table 38, college major [ $F(1,237)=30.32, p < .0001$ ] was the single best predictor of the number of jobs one and half years after college graduation with an R-square of .11. Student involvement in work activities [ $F(2,236)=13.78, p < .001$ ] attributed to an increase of five percent of the predictive power with an R-square of .16. The third of three predictors included in this model was involvement in educational activities [ $F(3,235)=5.59, p < .01$ ], which contributed to a two percent increase--producing an model R-square of .18.

The second regression model included a total student involvement score in place of the three individual scores for education, work, and leisure. The results of this statistical analysis was similar to the first; major was the first factor of consideration [ $F(1,237)=30.32, p < .001$ ], yet the total involvement score replaced that of the work and education scores with a total R-square of .13 [ $F(2,236, p < .05)$ ].

Table 38

Stepwise Multiple Regression for Number of Positions Held Since Graduation

Step	Variable	Regression Coefficient	F	df	R <sup>2</sup>	p
Including Separate Student Involvement Score						
1	Major	-.33	30.32	1,237	.11	<.0001
2	Work Activities	.002	13.78	2,236	.16	< .001
3	Educational Activities	-.003	5.59	3,235	.18	< .05
	Intercept	2.48				
Including Total Student Involvement Score						
1	Major	-.30	30.32	1,237	.11	< .001
2	Total Involvement Score	.001	5.57	2,236	.13	< .05
	Intercept	2.36				

Career Stability and Occupational Mobility. An additional major observation was made when considering occupational mobility. The results of this study clearly demonstrated a distinction in the perceptions of liberal arts and science alumni between career stability (intention to change careers) and occupational mobility (the number of jobs held since graduation). In other words, graduates did not necessarily equate a career change with a job change. Table 39 illustrates a 2 X 5 contingency table of number of positions held since graduation (one and more-than-one) and five levels of career stability (no change, considering change, planning change, selected new field, and establishing in new field) (chi-square= 23,  $p < .0001$ ). The largest single category of alumni had no intentions of changing and were in their first full-time job since graduation ( $n=56$ , 23.8%), while 39.7 percent who indicated no change had been employed in two or more jobs since graduation. This suggests that over a third of those individuals categorized as stable (no change considered) had been mobile in the job market.

Perhaps of greater interest were the 47.3 percent of those who were considering a career change, 64.4 percent of those planning a change, and 63.6 percent of those who had selected a new field had already held at least two jobs. This might indicate that occupational mobility provides opportunities

Table 39

Frequencies and Percentages of Stability by Number of Positions

Stability	Number of Positions Held		Total
	1	>1	
No change			
F	56	37	93
%	23.83	15.74	39.57%
Row %	60.22	39.78	
Col %	50.45	29.84	
Considering change			
F	30	27	57
%	12.77	11.49	24.26%
Row %	52.63	47.37	
Col %	27.03	21.77	
Planning change			
F	16	29	45
%	6.81	12.34	19.15%
Row %	35.56	64.44	
Col %	14.41	23.39	
Selected new field			
F	8	14	22
%	3.40	5.96	9.36%
Row %	36.36	63.94	
Col %	7.21	11.29	
Establishing in new field			
F	1	17	18
%	0.43	7.23	7.66%
Row %	5.56	94.44	
Col %	0.90	13.71	
Column	111	124	235
Total	47.23	52.77	100.00

Note:  $\chi^2 = 23$  with 4df,  $p < .0001$

for exploration, thus stimulating the desire to change career fields.

### Career Development Status

Career Development Status was determined by evaluating the degree to which subjects varied among mean scores for the three major career task sections of the Adult Career Concerns Inventory (Differential Career Status Score, DCSS). After performing a VARIMAX factorial analysis (See Table 7) the following three categories of career tasks were defined:

C1 = Crystallization  
Specification  
Implementation

C2 = Stabilizing  
Consolidating  
Advancing  
Holding

C3 = Updating  
Innovating

A DCSS score was generated for each alumnus or alumnae by calculating a sum of proportional differences between career task categories: Step 1- subtract the first from the second group mean and divide it by the first mean, Step 2- subtract the second from the third group mean and divide it by the second mean, Step 3- add the proportional scores together to produce the career development change score. For example:

$$(C2 - C1 / C1) + (C3 - C2 / C2) = DCSS.$$

The minimum DCSS was -1.91 and the maximum was 24.13. The high score was extreme when considering a mean score of .58 with a 2.39 standard deviation. Generally low DCSSs expressed little variation among career task categories. In other words, relatively flat profiles were reported by alumni when evaluating their levels of concern (0= "of little concern" 4 ="of great concern") for 45 career statements. This phenomenon was readily evident when reviewing individual mean scores of C1, C2, C3, and DCSS (Appendix H).

It was also interesting to discover that population range, mean scores and standard deviations were practically identical for career task categories: C1, C2, and C3. Minimum and maximum scores were 0 to 20 for C1 and C3, and 1 to 19.75 for C2 with mean scores of 12.1, 12.4, and 12.7, respectively. Standard deviations were also similar; C1 with 4.8, C2 with 4.2, and C3 with 4.4. In summary, individual and group difference results were minimal, nevertheless, subsequent statistical analyses were conducted to determine distinctive characteristics.

T-tests were conducted to determine whether DCSSs significantly differed between those who participated in specific educational, work, and leisure activities and those who did not participate (See Table 40). Results indicated that those who attended career-related workshops ( $p < .01$ ),

**Table 40**

T-test Results for Activity Participation and Career Development Status

Activity	N	Mean	SD	SE	T	p
<b>Career-Related Workshops</b>						
no	126	.96	3.04	.27	2.12	<.01
yes	94	.06	.79	.08		
<b>Career-Related Written Materials</b>						
no	108	.98	3.12	.30	2.39	<.05
yes	112	.20	1.27	.12		
<b>Full-time Internship/Summer</b>						
no	202	.62	2.49	.17	2.27	<.05
yes	18	.16	.43	.10		
<b>Work-Study Position</b>						
no	194	.64	2.50	.18	2.37	<.05
yes	26	.16	.46	.09		
<b>Residence Hall Council</b>						
no	210	.61	2.44	.16	2.82	<.01
yes	10	-.03	.49	.15		

referred to career-related written materials ( $p < .05$ ), were employed in full-time summer internships ( $p < .05$ ) and Work-Study positions ( $p < .05$ ) and were active in Residence Hall Council ( $p < .01$ ) tended to experience less differences among career development task mean scores.

Multiple regression analyses were conducted with independent variables such as gender, QCA, major, father's and mother's educational backgrounds, student involvement in educational, work, and leisure activities (three separate scores), and the number of positions since graduation. As reported by Table 41, not only did the associated analysis of variance produce no significant differences, but also none of the predictor factors were significantly associated with the differences among Differential Career Status Scores ( $R\text{-square} = .01$ ).

Total scores were also generated from the ratings (1 to 5) given for the 45 career issues on the Adult Career Concerns Inventory. Scores ranged from 15 to 177, with a mean of 112.22 and a standard deviation of 32.45. Relatively small DCSSs proved that minimal variance among individual concerns was evident. This also confirmed the speculation that subjects tended to consistently rate concerns either high, medium, or low. The question was therefore raised about the correlation between level of concern and level of total involvement of each individual. In other words, did highly

Table 41

Multiple Regression Analysis for Career Development Status

Variable	Parameter Estimate	Standard Error	p
Major	.0811	.176	.64
QCA	.0255	.193	.89
Father's Education	.0762	.163	.64
Mother's Education	-.1441	.176	.41
Gender	-.2423	.336	.47
Leisure	-.0004	.002	.83
Work	.0003	.002	.86
Education	.0013	.004	.74
Number of Positions	.2186	.180	.22
Intercept	.1636	1.053	.87

Note:  $R^2 = .01$

involved subjects tend to rate their concerns high or low? Total ACCI scores and total involvement scores yielded  $r = .03$ , indicating no detectable patterns between level of concern and level of involvement.

### Summary of Results

The research questions for this study can be summarized as follows: What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure) and four dimensions of the initial work period--career satisfaction, career stability, occupational mobility, and career development status. The results of the study showed that a modest, yet significant, relationship existed between individual and combined educational, work, and leisure activities and satisfaction in career progress, satisfaction in current employment, career stability, and occupational mobility. Step-wise multiple regression models illustrated that these experiential factors as well as academic factors (major and QCA) served to predict these criteria (R-squares ranged from .01 to .18), yet background variables (gender and socioeconomic status) did not. A few discernible patterns were evident when comparing participants and non-participants in specific activities mean scores for satisfaction, stability, mobility, and career development status. Surprisingly, career-related educational experiences, such as meeting with a career

counselor or advisor concerning career concerns, attending workshops or seminars, working with interactive computer programs, and reading written materials were negatively associated with several dependent variables. Subjects who had engaged in these activities expressed lower levels of current job satisfaction, higher levels of career instability, and held significantly more full-time positions since graduation.

On the other hand, employment in career-related work experiences demonstrated a more desired relationship to mean mobility, stability, and satisfaction scores. Those in the ROTC program proved to be less mobile, former Cooperative Education participants were more stable in their careers, those who held paid internships during the school year were more satisfied with future opportunities, and those who had part-time summer internships were more satisfied with their current employment situations. Conversely, full-time employment during the school year was significantly associated with greater occupational mobility.

Some leisure experiences were generally associated with higher satisfaction scores, with two exceptions. Membership in professional societies related to higher levels of satisfaction in current employment and future prospects. Those who engaged in social organizations and intramural

sports were consistently more satisfied in all areas of career satisfaction when compared to non-participants. On the other hand, association with intercollegiate sports and volunteer service organizations related to instability.

Career development status, determined by a Differential Career Status Score, indicated little difference among career task categories for each respondent. Although DCSSs were relatively flat, t-tests results suggested that participation in five activities were related to low status scores: career-related workshops and materials, employment in the Work-Study Program and full-time summer internships, and membership on the Residence Hall Council.

It is clear that participation and involvement in specific and cumulative educational, work, and leisure activities were associated with aspects of the initial work experience. Although the R-square values are relatively low, it was nevertheless important to establish that relationships exist between college and post-college factors and critical dimensions of employment the first year and a half after college graduation.

## CHAPTER V

### DISCUSSION AND RECOMMENDATIONS

#### Review

Career development theory clearly maintains that exploration is a major aspect of the career development and decision making process (Ginzberg & Associates, 1951; Jordaan, 1963; Super & Bohn, 1970). Exploration, which is facilitated by exposure to and involvement in a range of experiences, is especially relevant for those between 15 and 24 years of age and enables individuals to gain a sense of self (abilities, knowledge, skills) and aspects of the world of work (job requirements, aspects of employment, the work environment, company philosophies). This process provides opportunities and information by which to make decisions regarding employment. What is not clear in theory is the form in which exploration takes during the critical years of college and whether aspects of the college experience serve to enhance the career development process, thus producing desired outcomes in occupational choice upon graduation.

The purpose of this study was, therefore, to take a closer look at the construct of college student involvement in out-of-class activities as a function of exploration and to

analyze the extent to which involvement in those educational, work, and leisure activities related to selected aspects of the initial work period: career satisfaction, career stability, occupational mobility, and career development status.

A total population study of Liberal Arts and Sciences 1986 Spring graduates from a large, four-year state university was conducted for two reasons. First, research revealed that recent post-college employees tend to be highly mobile, thereby posing the potential problem of locating individuals. A full population study would increase the possibility of contact, consequently generating enough data to yield significant results. Second, this study required individuals to provide self-reported, retrospective data. Surveys were therefore administered to recent college graduates (one and a half years after graduation) to minimize the effect of reliability and recall error.

Alumni follow-up questionnaires were mailed to all Liberal Arts and Sciences graduates who completed their bachelor's degrees in Spring of 1986 and did not pursue full-time continued education or homemaking (N=452). Three strategically-timed mailings generated a 52.6 percent return rate of useable data (N= 234). There was no reason to believe that the respondents of this study were not representative

of the entire population, with the exception of grade average. Non-participants achieved lower cumulative averages than the respondents.

Interestingly, specific background variables were associated with tendencies to participate and the degree of alumni involvement in educational, work and leisure activities. Analysis of variance results indicated that women, more than men, participated in both educational and work activities, while men tended to be more involved in educational activities. Math majors participated less and were less involved in educational activities, as were those whose mothers had less than a high school degree. Former students with lower quality credit averages (QCA) were employed in more positions during college, whereas higher levels of involvement were reported by humanities and natural science majors as well as by those whose fathers had a high school diploma or less.

Various analyses were generated for the purpose of examining the relationship between student participation and involvement in out-of-class activities and aspects of the initial work period--three dimensions of career satisfaction, career stability, and career development status. These efforts were made in order to answer the research questions posed in this study. The four questions

can be summed in a single inquiry: What is the relationship between college student involvement in out-of-class experiences (educational, work, and leisure) and four dimensions of the initial work period--career satisfaction, career stability, occupational mobility, and career development status? It should be noted that the occupational mobility variable was incorporated into this research after the collection of the data due to its apparent importance to this study. Descriptive and inferential analyses were therefore conducted on this dependent variable and with this independent variable. was often employed as a post-graduation factor in the examination of predictor variables in multiple regression analyses and selected criterion variables.

The majority of Liberal Arts and Sciences alumni were overall satisfied with three aspects of career satisfaction. The largest percentage were very satisfied or satisfied with future career prospects (80.9%), followed by 77.9 percent with career progress to date, and 66.9 percent with their current job situations.

According to t-test results, mean scores for satisfaction were significantly different between participants and non-participants of specific out-of-class activities. Engagement in all but two significant activities demonstrated

a positive association with satisfaction. Satisfaction with career progress was higher for those who participated in professional societies and intramural sports. Future career opportunities satisfaction was related to paid internships during the school year, participation in social organizations, and involvement in intramural sports. Similarly, those who were employed in paid part-time summer internships, belonged to professional societies, and played on intramural sports teams indicated higher levels of satisfaction with their current jobs, whereas those who used career-related computer programs and were members of off-campus church organizations yielded significantly lower levels of satisfaction than did their non-participant counterparts.

Low levels of occupational stability and high levels of occupational mobility (number of positions held since graduation) are characteristic of most individuals in the initial work period after graduation (Brenner & Hitchcock, 1986; O'Neal & Wallace, 1980; Richards, 1984b). Liberal Arts and Sciences graduates in this study were consistent with previous studies in this regard. Surprisingly, within a year and a half after graduation over 53 percent of respondents were in at least their second full-time job. In addition, 42.2 percent had either considered or planned a career change and 17.2 percent had either selected a new field or were

getting established in a new field. Both math and natural science majors demonstrated significant tendencies toward stable and low mobility careers.

Career stability was related to participation in five educational and leisure activities. T-tests revealed that all but one had an "unstabilizing" result, i.e. participation and stability were inversely related. Alumni who met with counselors and advisors about career-related topics, used career-related materials, and participated in intramurals and volunteer service demonstrated greater propensities to consider, plan, select, or settle in new career fields. On the contrary, those who enrolled in the Cooperative Education Program were less likely to consider a change when compared to non co-op students.

Occupational mobility was measured by the number of full-time jobs held since graduation. Approximately 46 percent of the respondents were in their first position at the time of the study, 45.3 percent had two or three jobs, while 8.1 percent had four or five. ROTC participants held significantly fewer jobs than their non-participant counterparts, while higher levels of mobility were related to five other activities: career-related workshops and use of computer programs, full-time and part-time employment during the school year, and membership on the Residence Hall Council.

Career development status was determined by Differential Career Status Scores (DCSS) and revealed minimal subject differences among career task categories. T-tests analyses nonetheless showed association between participation in career-related workshops, use of written materials, Work-Study Program participation, full-time summer internships, Residence Hall Council membership and low DCSSs.

The step-wise regression technique as employed to examine the relationships between experiential variables (educational, work, and leisure, as well as number of positions held since graduation), academic variables (QCA and college major), and background variables (gender and father and mother's educational backgrounds) with four criterion variables--career satisfaction, career stability, occupational mobility, and career development status. Additional regression models were generated using a summed total student involvement score in place of the three individual involvement scores. The .10 alpha level of significance was accepted for these analyses due to the exploratory nature of this study.

Little variance among DCSSs for individuals and among respondents made it impossible to generate any significant distinctions among independent variables for a regression analysis. Similarly, no variables related to satisfaction

with future prospects. Otherwise, all experiential and academic variables yielded weak, though significant, R-squares results.

Satisfaction in career progress analyses included involvement in leisure and work activities and number of jobs since graduation (R-square = .03). Leisure activities, number of jobs, and QCA yielded an R-square of .04 for satisfaction with current position. In both cases, total involvement scores were significant, when considered in the equations. It was the only predictor for the former (R-square = .01) and was the first of three for the latter (R-square = .04).

Career stability and occupational mobility also shared common factors. The first and second significant factors were academic major and involvement in work activities (R-square = .05 for stability). The third factor for mobility included involvement in educational experiences (R-square = .18). Total involvement was the second of two factors for mobility (R-square = .13) and was not significant for predicting stability.

In conclusion, involvement in summed educational, work, and leisure activities generally demonstrated modest, though significant, relationships with three dimensions of the initial work experience. Participation in specific

activities, such as social and professional organizations, intramural sports, internships, and meeting with a career advisor, revealed stronger associations with all four criterion variables.

### Discussion

Career development theory emphasizes exploration as a major function of the career development and decision making experience. This study was theory driven with the purpose of further defining the nature of exploratory behaviors during the college years and their influence on dimensions of the initial work experience after graduation. It was, therefore, reassuring to discover that involvement in out-of-class experiences was somewhat associated with manifestations of career development, yet the weak relationships were disappointing. A clear explanation cannot be given for the combination of significant regression variables that were associated with satisfaction with career progress and current employment, career stability, and occupational mobility. In view of the R-square range of .01 to .18, perhaps of greater importance is the 82 to 99 percent of the variances among criterion factors not addressed in this study.

It should be of no surprise that myriad differences among individuals, as well as intervening factors, make each

situation unique and thereby influence occupational choices, changes, and subsequent satisfaction. Previous studies, for example, have identified numerous intrinsic and extrinsic factors that affect satisfaction in the work place and may serve to account for some of the variance not explained by the variables in this study. Aspects of satisfaction, such as feelings of accomplishment, job congruency with personality, types of responsibilities, location, salary, relationships with co-workers, competence of the supervisor, physical surroundings, feeling of importance, promotional opportunities, job security, and reputation of the company were established as important considerations (Mount, 1984; Swaney & Prediger, 1985). Certainly the presence or absence of these conditions would effect an individual's sense of satisfaction, the result of which might compel him or her to move to another job, company, or occupational field.

Sociologists, economists, and psychologists have focused their research efforts on voluntary, involuntary, and opportunistic factors attributing to occupational selection and change--stability and mobility. For instance, Bolles, (1986) and Menche and Hummel, (1984) promote the notion of career planning and goal setting. This approach suggests that the achievement of carefully articulated plans are accomplished by deliberately seeking specific jobs, work settings, or geographical locations.

Others pose that happenstance and chance encounters are environmental and situational circumstances beyond one's control. These factors potentially effect whether one is offered or retains a job (Bandura, 1982; Miller, 1983, Miller and Form, 1964). Examples would include (a) environmental contingencies such as the conditions of the labor market, access to job vacancies through social networks, preferences of employers regarding the hiring of particular sex, race, or social class (Gottfredson & Becker, 1981); (b) varying and sometimes limited number of jobs within one's preferred occupational field (Holland, 1985, Parsons & Wigtil, 1974); (c) family or spouse expectations, poor health, economic conditions of the community or company, salaries, size of the organization, relationships with peers or supervisor (Bloland & Shelby, 1980; Rabinowitz & Hall, 1981); and (d) forced change due to prolonged illness, sudden reduction of force, and a reassignment of positions (Hiestand, 1971; Parnes et al., 1975; Thomas, 1980).

Lastly, unexpected opportunities, such as the opening of a new position within the office or a job offer made by a family acquaintance, have been cited as means by which individuals can achieve occupational goals or make career moves (Roberts, 1968; Rothstein, 1980; Simon, 1976). These, as well as various combinations of the above cited factors, could substantially influence occupational situations with regard

to selecting, obtaining, and remaining in a job or occupational field, as well as the level of satisfaction within a job or occupational field. It is, therefore, not surprising to acknowledge the minimal effects that involvement in college activities have on post-college employment.

While summed educational, work, and leisure and total involvement scores demonstrated modest relationships with three aspects of the initial work experience after graduation; participation (a major component of involvement) in specific activities proved to have strong relationships with all criterion variables. Notably, participation results were mixed and a number of observations were unexpected. Engagement in some activities, for example, were associated with high levels of satisfaction, low mobility, and stable careers, whereas other activities yielded less desirable ratings. Some of the results were not understood and will therefore go unexplained, yet observations of interest deserve special mention.

Distinct patterns between participation in actual and potential career-related experiences with mobility, stability, and satisfaction were most curious. Those who met with a counselor about career concerns and who referred to career materials were less stable in their careers, and those

who used interactive computer programs were less satisfied with their current jobs. Speculations suggest that those who resorted to these career resources for the purpose of occupational exploration and guidance were perpetual inquirers who will not be satisfied or settled until they locate the ideal occupational situation.

Another curious finding was that those who attended career-related workshops and used computer programs, as well as those who were employed on a full- and part-time capacity during the academic year, tended to be more mobile in the job market. When considering the guidance and work experiences these individuals had prior to graduation, it is baffling to discover inclinations toward job change. Much like the explanation offered for satisfaction, maybe those who sought assistance with their endeavors to explore occupational options had a greater propensity to explore without resolution, consequently experiencing higher levels of mobility as they continued to seek appropriate employment. These alumni, on the other hand, might not have been floundering in the job market. On the contrary, full-time employment and the use of career resources might have facilitated the development of realistic goals, thus the pursuit of job opportunities might have been necessary to achieve those plans. Mobility, in this case, would be

vertical mobility, suggesting that individuals might have moved up "the career ladder" and not merely from job to job.

Educational career-related activities were generally associated with less desirable outcomes for post-college employment, whereas career-related work and leisure activities tended to have a desirable relationships with ratings for satisfaction, stability, and mobility. Specifically, employment in internships and membership in professional and social organizations yielded higher satisfaction in career progress, current employment, and future prospects. Enrollment in the Cooperative Education and ROTC Programs during the college years generated more stable and less mobile ratings, respectively.

A number of previous studies attributed satisfaction, longevity in the work place, and career stability to participation in cooperative education (Bales 1979); Jagacinski, LeBold, Linden, & Shell, 1986; Tyler, 1971), internships (Atkins, 1980), and pre-vocational and pregraduation work experiences (Richards, 1984b). In each case it was suggested that these career-related experiences offered individuals opportunities to develop well formulated impressions of the world of work, necessary skills, and realistic expectations of employment. A natural advantage of participation would be that individuals could either

confirm or redirect their career plans prior to graduation. Perhaps, these principles hold true for the subjects of this study who participated in internships, Cooperative Education, and professional and social organizations.

Similar interpretations might give insight into the fact that math and natural science majors were significantly more stable and less mobile than were social studies and humanities majors. It appears that course and laboratory projects required of the former are representative of the types of skills and knowledge required of occupations within the respective fields. Math and science degree recipients might have been better prepared and held more realistic expectations as they pursued post-college employment.

Those who enrolled in the ROTC Program designated significantly fewer jobs since graduation. A requirement of the program is a commitment to serve in the military upon graduation, thus it is not surprising to find limited mobility among these individuals a year and a half after graduation.

Interestingly, those who played intramural sports engaged in the only activity associated with higher levels of satisfaction in all three categories (career progress, current job, and future career prospects). Perhaps the

outgoing and competitive disposition of those who engaged in extracurricular recreation also drove them to pursue and obtain desirable jobs, which resulted in overall career satisfaction. These individuals might also look for those leisure activities outside the confines of the office to fulfill their needs for satisfaction. In contrast, those who were involved in intercollegiate sports during college were relatively unstable in their careers. Perhaps, the amount of time devoted to preparing for and playing during the sport seasons delayed the career decision making process until after graduation.

The activities addressed in this study were ones in which individuals engaged voluntarily, with the exception of student teaching and possibly internships for credit. A trait of important consideration would, therefore, be the that of self selection. The characteristics that motivated college students to work, socialize, gather information, seek advice, exercise, or provide a public service might be a function of their personality, financial need, desire to gain information or experience, or level of maturity. For instance, some personalities might be more amenable to involvement than others. The wide range of activity involvement scores, evidenced in this study, could be linked to personality types. If personality is demonstrated through involvement, it might also be indicative of motivations

associated with the career decision making and job search process.

Another self selection consideration might include whether mature individuals, when compared to immature individuals, tend to seek opportunities to explore, gain experience, and develop necessary skills. Conversely, maturity might not be the driving force but might be the by-product of engagement in various activities. The impetus to participate, whatever it may be, could have direct bearing on the types of jobs and occupational fields considered and ultimately chosen, attitudes about work, and motivation to remain or change.

One unexpected factor came to the attention of the researcher while coding surveys. A number of respondents were employed in the military services and wrote comments on the questionnaire in regard to the effects that being in the military had on their career situation. For example, one alumnus wrote, "This questionnaire does not apply well to people in the active duty military, as we have no occupational choice until the end of our initial commitment." A closer look at the respondents revealed that 23 of the 24 individuals enrolled in the ROTC Program during college were employed in military positions at the time of the study. The responses of those in this capacity may have been influenced by their military status. Perhaps future research could

compare those in civilian jobs with those in military forces in regard to career satisfaction, stability, occupational, or career development status.

A series of observations can be made regarding the construct of career development status, as well as its measurement in this study. Career development status was originally to be determined by the summed total of the level of concern for 45 career issues listed on the Adult Career Concerns Inventory (ACCI). The measurement of this construct was altered due to the observation that respondents tended to rate most listed career issues with similar levels of concern (1 = "of no concern", 5 = "of great concern"). Relatively flat career concerns profiles, substantiated by low DCSSs, stimulated two major issues: (a) the tendencies of recent graduates and (b) the appropriateness of the ACCI for the purpose of this study.

First, the ACCI was designed to illustrate an individual's position among career tasks and stages. Super's (1957) career development theory maintained that tasks and stages were age-linked. More recent studies indicated that bimodal and trimodal profiles were possible regarding task and stage development. Tasks are thus not exclusive to a particular age group, thereby making it possible to contend with tasks associated with various stages.

In the case of this study, minimal task and stage distinctions were demonstrated by recent liberal arts and science graduates. This suggests that some were extremely anxious about all aspects of their work-lives, even tasks that ranged from discovery of personal skills and occupations options to advancing within their chosen fields. Other alumni were moderately concerned across the board, while others expressed little concern at all. Speculation were made as to the possible relationship between level of concern and level of involvement. Perhaps, those who were highly involved during college were also highly concerned with their post-college situations. Interestingly, the correlation between those factors was .03, indicating no relationship. Nevertheless, the phenomenon calls attention to the nature of young professionals and their consistent level of concern for all aspects of their career development simultaneously.

Second, the ACCI did not prove to be a useful measure of career development level in this particular study. A number of reasons are offered regarding this observation. The five-point scale for rating career concerns (1 = "of no concern" and 5 = "of great concern") was not discriminating for the purpose of this type of study. For example, the rating of "1 = of no concern" could mean that an individual had not yet considered that issue, whereas, for another it might mean that the issue had already been addressed and was

no longer of concern. This single rating has more than one interpretation and signifies different levels of career development.

Perhaps a more appropriate ACCI scale would be the one administered in Phillips' (1982a) research. The following choices would assist the researcher to more fully understand the respondent's position on specific issues and provide more descriptive choices for the respondent: (a) Have not yet had to think seriously about this, (b) A growing concern, beginning to become important, (c) A strong concern at the present time, actively engaged in this, (d) Still some concern, but declining in importance, and (e) No longer a concern, past that stage.

Next, previous studies implemented the ACCI to populations of heterogeneous ages, whereas the focus of this study was on a homogeneous group. It is logical to assume that variance among those of common age would be less apparent, yet it was confounding to observe that individuals lacked distinction among vocational tasks and stages. These unexpected results call into question the appropriateness of this particular instrument for research of this nature and for a population of young, anxious, ambitious, career-minded bachelor's degree recipients. An alternate instrument might

better identify the career development status of recent college graduates.

The responses of the sample group challenged the task arrangement in Super's theoretical structure. Results of the VARIMAX rotated factor analysis produced a slightly different configuration. Instead of finding commonality among (a) crystallization, specification, and implementation (b) stabilizing, consolidating, and advancing, and (c) holding, updating, and innovating, factor analysis generated the following task groupings: (a) crystallization, specification, and implementation, (b) stabilization, consolidating, advancing, and holding, and (c) updating and innovating. These findings were similar to those of Mahoney (1986) where establishment and maintenance tasks grouped together with factor analytic analyses.

These comments challenge the usefulness of the ACCI for this population and this study. The findings suggest that additional efforts be made to further refine the ACCI to accommodate and describe the career concerns and status of young, college educated employees.

Perhaps a more deep rooted issue needs to be raised in regard to vocational theory itself. Theory offers general explanations concerning what occurs during the career

development process and when it takes place chronologically; yet, theory provides little empirical evidence to substantiate and define how this process is manifested and the factors, situations, and persons that stimulate and reinforce occupational choice and promote advancement of tasks and stages.

In an attempt to offer clarity to the nature of exploration and its effect on aspects of the career development process, this study seriously considered the tenets of Astin's theory of involvement. The outcomes of Astin's work (1983) posed that a combination of quality and quantity involvement in college activities, residential living, and relationships with college staff lead to satisfaction and persistence in college. Perhaps it was far reaching to impose these principles on the career development process. In fact, weak associations were illustrated between involvement and career satisfaction and persistence (stability and mobility) in alumni working careers. Additionally, it became obvious that high levels of involvement (participation and importance) did not mean high degrees of exploration and, therefore, the advancement of the career development process. On the contrary, high involvement scores were not significantly correlated with any dimension of post-college employment or career development status.

The temptation exists to view the career development and decision making in less developmental terms and more within the categorical career maturity patterns purported by Gibbons and Lohnes (1968). Their scheme poses that four distinct operating styles account for individual differences that exist regarding levels of maturity and tendencies: (a) constant maturity--the consistent pursuit of initial occupational goals; (b) emerging maturity--the process by which an individual progresses through career development stages, such as Super's; (c) degeneration--termination of goal achievement; and (d) constant immaturity--concentration on unrealistic goals, resulting in numerous changes. This approach departs from the developmental theories in that age and experience are not necessarily a function of how one operates with regard to his or her choices and changes of occupations.

The findings of this study offer little assistance in defining exploratory behavior as it pertains to college student involvement in out-of-class activities. Perhaps the career development and decision making process is developmentally linked and, hence, little is gained by involvement in random education, work, and leisure activities. Is maturity a function of time and experience, or merely time? More so, it is reasonable to speculate that recent college graduates are generally immature in their

career development, and therefore unable to make clear distinctions among career tasks.

Although the results of this study were mixed--attributing weak relationships between summed educational, work, and leisure involvement and three dimensions of the initial work period and strong associations between participation in specific activities all four criterion variables--this should not diminish the importance of this research. Early stages of noteworthy higher education attrition studies also produced R-squares of similar value. For example, the power of predicting dropout tendencies was .05 in Mehra's study (1973), .09 Wegner and Sewell's study (1970), and .12 for Bayer's study (1968). Stronger predictions were developed over time as demonstrated in Pascarella, Smart, and Ethington's (1986) recent study where they implemented a 14-variable path analytic model. The results from this attrition study significantly predicted 25.5 percent dropout rates for women and 22.8 percent for men.

While persistence/withdrawal behavior among college students has been an issue of considerable interest over the years, the concern over college student outcomes has been on the uprise. Assessment trends focus on the benefits of various aspects of the college experience. Perhaps the attrition study examples suggest that modest results do make notable

contributions by providing useful information otherwise not known, as well as a stepping stone for further research within the field. Therefore, the results of this study, which focused on the career development outcomes of involvement in out-of-class experiences, have hopefully made clearer the relationships between college student involvement in educational, work, and leisure activities and the initial work period and will be a catalyst for further research.

#### **Recommendations for Further Study**

Based on the results and subsequent discussion of this career-development, alumni follow-up study, a number of recommendations are offered for further investigation. First, although this study demonstrated a significant relationship between involvement in out-of-class activities and career aspects of post-college experience, it provided little assistance toward the need for continued efforts to further define the form in which exploratory behaviors are realized during the college years. Two questions, therefore, need to be answered along this train of thought: (a) What exploratory behaviors and experiences stimulate and reinforce the career development and decision making process? and (b) If not student involvement in education, work, and leisure, what are the aspects of the college experience that enhance the career development process and have sustained effects on that process.

Second, there is a need to more closely examine the factors associated with and the nature of critical aspects of the career paths of those in the the exploration stage. It is suggested that subjects designate specific factors that were instrumental in decisions regarding (a) occupational choice, (b) job upon graduation, and (c) persistence or change of jobs or career fields and subsequent satisfaction. The interview approach might be the most effective means by which to obtain the details required for this type of inquiry.

An additional measure should be taken to assess the nature of the choices and changes as well as the factors of influence. For example, how many jobs did an individual hold, what were the internal and external factors of consideration, were the changes made merely to another job within the same field or was it a career move, and were the changes horizontal or vertical? Perhaps, Super's (1957) career patterns classification scheme could be implemented to assess the types of movement: trial, instrumental, establishing, floundering, or stagnation.

In regard to investigating the career development status of recent college graduates, a third set of recommendations are made. Since flat career concerns profiles were expressed by recent college graduates, it would be worthwhile to analyze the nature of the concerns expressed by young employees.

Why, for instance, would the majority of the alumni in this study consistently rank high levels of concern for crystallization, specification, updating, and innovating tasks while others reported little concern regarding career issues?

It would also be beneficial for a study of this nature to incorporate the ACCI response scheme used by Phillips (1982a). This effort would both give respondents more descriptive options and to assist the researcher to better identify the respondent's position in regard to specific issues: (a) Have not yet had to think seriously about this, (b) A growing concern, beginning to become important, (c) A strong concern at the present time, actively engaged in this, (d) Still some concern, but declining in importance, and (e) No longer a concern, past that stage. The information gained by the use of these choices would generate more meaningful data for the analyses of career development status.

Additionally, it is not clear that the ACCI is an appropriate instrument to discriminate among career tasks for a homogeneous population of recent college graduates. An alternate instrument could be used to more accurately measure the career development status of young adults.

Fourth, an interesting point was brought to the attention of the researcher upon reviewing returned questionnaires. A number of alumni were employed within the military and showed signs of being somewhat different than their non-military counterparts. An additional occupational aspect might be investigated--the relationship between military status (military and non-military) and various aspects of employment.

#### Summary

This study of recent liberal arts and sciences graduate contributed little assistance in the effort to further define aspects of career exploration and subsequent manifestations of the career development process. Weak, though significant, relationships were found between college student involvement in separate and combined educational, work and leisure activities and critical aspects of the initial work period, while participation in specific activities were more strongly associated with career development outcomes.

In addition to these findings, this study has also laid the ground work for further investigations of career development outcomes of this sort. There is clearly a need for continued efforts to further describe aspects of career development theory such as (a) exploratory behaviors that constitute career exploration, (b) factors, and perhaps personalities,

that differentiate individuals regarding the successful pursuit and subsequent satisfaction in occupational choices, and (c) additional aspects of the college experience that facilitates the career development and decision making process as reflected in employment outcomes.

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APPENDIX A  
Research Plan Schedule

## Research Plan Schedule

### Questionnaire Construction and Distribution

### Data Collection and Analysis

1. Survey Pretest (October 5)
2. Survey Revision (November 10)
3. Alumni mailing labels and listing printed (November 18)
4. Survey Instrument (N= 1,200) and Follow-up Post Cards (N= 300) Printed (November 20)
5. Code surveys with student identification numbers and packets prepared for mailing (November 20)
6. Survey Dissemination
  - Saturday, November 21, 1987 First Mailing (Day 1)
  - Monday, December 3, 1987 Follow-up post card will be mailed (Day 17)
  - Saturday, December 19, 1987 Second questionnaire will be mailed (Day 29)
7. Process returned questionnaires through the receipt control system
8. Last day of data collection (January 28, 1988)
9. Last day of data entry (February 19, 1988)
10. Data Generation (March 2, 1988)
11. Data Analysis

APPENDIX B

Letters of Permission  
for  
Instrument and Figures

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Blacksburg, VA. 24060

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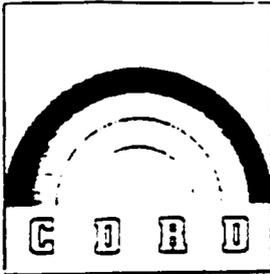
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## CAREER DEVELOPMENT - RESEARCH AND DEVELOPMENT

Donald E. Super, MA (Ed.), PhD, DS, 18P&S  
2110 Millery Blvd., Savannah, GA 31406 USA  
Tel. 912 352 2196

November 9, 1987

Ms. Donna E. Cassell  
Blacksburg, VA 24000

Dear Ms. Cassell:

As you know, I've been in Europe for six weeks, one third of them in Poland and, with Iron Curtain delays, out of touch. And, on my return, confronted by an inconceivable amount of mail.

But, herewith, a copy of the bibliography for the ACCI Manual (I've not yet seen galley, so this is the best copy I can send). The thesis looks interesting, and you have some good work on which to build. The Super and Knasel publication can be obtained only from NICEC, address now Balls Park, Hertford, Herts., England, or from Caterine Casserly, Employment Services Support Branch, Canada Employment and Immigration, Ottawa K1A 0J9, Canada. Try the latter, as it will be more personal and she is a helpful person (CEI contracted for the study, but you really don't need it, only the Super and Kidd reference that led to the contract).

And, of course, you can use Table 4, citing the source.

Good luck to you as you proceed: I shall look forward to seeing your results.

Sincerely yours,

Donald E. Super, Ph.D.

---

Dept. of Psychology  
Armstrong State College  
Savannah, GA 31418

Dept. of Psychology  
University of Florida  
Gainesville, FL 32611

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University of Georgia  
Athens, GA 30601

Dept. of Counseling Psychology, Teachers College, Columbia University, New York, NY 10027

---

Blacksburg, Va 24060

Monday, March 21, 1988

Ms. Cheryl Greenway  
Permissions Department  
350 Sansome Street  
San Francisco, CA 94104

Dear Ms. Greenway:

As I mentioned on the telephone today, I would like to have permission to duplicate and use Donald Super's Life Stage and Substage figure, found in Brown & Brooks (1985) Career Choice and Development, (p. 202) for my doctoral dissertation. I would very much appreciate a quick response to this request; my doctoral defense date is upcoming.

Thank you for your consideration.

Sincerely,

Donna E. Cassell

Enclosure

3/25/88

Permission granted as stipulated above.

Permissions Editor

D. Cassell  
Virginia Tech  
Blacksburg, VA

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APPENDIX C

Liberal Arts and Sciences Alumni Survey  
Class of 1986

Pilot Survey

## Liberal Arts and Sciences Alumni Survey Class of 1986

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Monday, October 5, 1987

Dear Tech Alumnus:

"What job am I qualified for with my major?" "I want to make an appropriate occupational choice. What can I do or what can I read to assist me with this critical decision?" These questions may sound familiar to you, for as you are aware, the career decision making process for many liberal arts and science students is a difficult one.

Your participation in this alumni study will assist in an effort to provide meaningful information to current and prospective students as they explore occupational options. This questionnaire asks you to recall specific aspects of your college experience as well as to consider current career concerns you might have. Completing the survey will only require 20 to 30 minutes of your time and may prove to be interesting.

A successful rate of return is critical to the results of this study. Please complete the survey as soon as possible, fold it as indicated, staple or tape it, then drop it in the mail. Your responses will be treated confidentially; only group results will be reported. The identification number on the survey will be used for the purpose of tracking respondents and removing your name from the mailing list when the survey is returned.

If while completing this survey you have any comments, suggestions, or concerns, PLEASE feel free to write on the questionnaire next to the area of concern. If you have any questions pertaining to this questionnaire, please call or write. I can be reached at either (703) 961-6241 or 961-2374.

Thank you. Your time and interest are greatly appreciated!

Sincerely,

Donna E. Cassell  
Placement Counselor  
University Placement Services

# Liberal Arts and Sciences Alumni Survey Class of 1986

## I. BACKGROUND INFORMATION

1. What was your undergraduate college major(s)? \_\_\_\_\_
2. What was your QCA at the time of graduation?     3.51 - 4.00  
    2.50 - 3.50  
    2.51 - 3.00  
    2.00 - 2.50
3. Are you currently employed?    Yes    No  
    If yes, please indicate your current position\* \_\_\_\_\_
4. List the full-time position(s)\* you have held since you received your bachelors degree.  
    1st Position \_\_\_\_\_  
    2nd Position \_\_\_\_\_  
    3rd Position \_\_\_\_\_  
    4th Position \_\_\_\_\_

\*= Include only those position which you worked 30 hours or more. If you are a full-time graduate student or homemaker, include these as "positions."

5. Father's educational background:     Less than high school degree  
    High school degree  
    Some college  
    Bachelor's degree  
    Graduate work or degree
6. Mother's educational background:     Less than high school degree  
    High school degree  
    Some college  
    Bachelor's degree  
    Graduate work or degree
7. Gender:    Female    Male

## II. STUDENT INVOLVEMENT IN OUT-OF-CLASS ACTIVITIES

- For this portion of the survey consider those out-of-class programs, activities, and experiences in which you were involved during your junior and seniors years of college.
- In **Section A** please indicate whether you **participated** in each of the experiences listed on- and off-campus during your undergraduate experience.
- Also, use the blank spaces (designated "other") to specify additional experiences in which you were involved. For example, if the list does not include a program or organization **OR** if you had more than one experience in a given category, please add it (e.g. you had three summer jobs, therefore add two extra jobs on the bottom of the paid work experience category).
- In **Section B** please indicate the level of importance you placed on those experiences which you designated in Section A of this survey. Activities may be personally important for several reasons: to make new friends; to develop leadership, work, or athletic skills; to have fun; to gain career related experience, etc. On the other hand, one might participate in activities with little or no importance.

**SECTION A: PARTICIPATION IN OUT-OF-CLASS ACTIVITIES**

Please indicate whether you participated in the following events by checking the appropriate circle.

- |  |                       |                       |
|--|-----------------------|-----------------------|
| <b>1. Educational Experiences</b> (out-of-the-classroom activities, programs, and experiences) | No                    | Yes                   |
| Practicum or internship for credit   | <input type="radio"/> | <input type="radio"/> |
| Student teaching   | <input type="radio"/> | <input type="radio"/> |
| ROTC program   | <input type="radio"/> | <input type="radio"/> |
| Met with career or placement counselor, academic or career adviser about career concerns       | <input type="radio"/> | <input type="radio"/> |
| Attended workshop or seminar on career related topics  | <input type="radio"/> | <input type="radio"/> |
| Completed career assessment, interest, or personality inventory                                | <input type="radio"/> | <input type="radio"/> |
| Used written materials on career topics  | <input type="radio"/> | <input type="radio"/> |
| Used computer programs for career planning purposes (e.g. SIGI, Virginia VIEW)                 | <input type="radio"/> | <input type="radio"/> |
| Other: _____   | <input type="radio"/> | <input type="radio"/> |
| Other: _____   | <input type="radio"/> | <input type="radio"/> |

- |  |                       |                       |
|--|-----------------------|-----------------------|
| <b>2. Paid Work Experience</b>                           | No                    | Yes                   |
| Paid internship during school year                       | <input type="radio"/> | <input type="radio"/> |
| Part-time paid internship during summer                  | <input type="radio"/> | <input type="radio"/> |
| Full-time paid internship during summer                  | <input type="radio"/> | <input type="radio"/> |
| Cooperative education                                    | <input type="radio"/> | <input type="radio"/> |
| Work-Study position                                      | <input type="radio"/> | <input type="radio"/> |
| Full-time job during summer                              | <input type="radio"/> | <input type="radio"/> |
| Part-time job during summer                              | <input type="radio"/> | <input type="radio"/> |
| Full-time job during school year (other than Coop)       | <input type="radio"/> | <input type="radio"/> |
| Part-time job during school year (other than Work-Study) | <input type="radio"/> | <input type="radio"/> |
| Other: _____   | <input type="radio"/> | <input type="radio"/> |
| Other: _____   | <input type="radio"/> | <input type="radio"/> |

- 3. Leisure and Volunteer Activities/Non-paid Experiences**  
 Use the following scale to indicate the average number of hours per week you participated in the organizations and activities listed during your junior and senior years.

- |                                 |                            |
|---------------------------------|----------------------------|
| a = None                        | d = 6-10 hours per week    |
| b = Less than one hour per week | e = Over 10 hours per week |
| c = 1-5 hours per week          |                            |

	(a)	(b)	(c)	(d)	(e)
<u>On-Campus Activities:</u>	None	< 1	1-5	6-10	10+
Service organization (e.g. Circle K, Alpha Phi Omega)	<input type="radio"/>				
Social organization (e.g. fraternity or sorority)	<input type="radio"/>				
Religious organization (e.g. BSU, Navigators)	<input type="radio"/>				
Academic club (e.g. Poli Sci club, Bio Chem club)	<input type="radio"/>				
Professional society (e.g. Pre-Law Society)	<input type="radio"/>				
Intramural or club sports (e.g. lacrosse, volleyball)	<input type="radio"/>				
Intercollegiate Athletics	<input type="radio"/>				
Residence hall council	<input type="radio"/>				
Other: _____	<input type="radio"/>				
Other: _____	<input type="radio"/>				
 <u>Off-Campus Activities:</u>					
Civic organization (e.g. rescue squad)	<input type="radio"/>				
Church organization	<input type="radio"/>				
Volunteer with service program (e.g. Big Brothers, tutoring)	<input type="radio"/>				
Active with hobby or interest area (e.g. flower arrangement, pro-life)	<input type="radio"/>				



### III. CAREER CONCERNS INVENTORY

This portion of the survey consists of 45 career concerns and requires you to consider your current working career. How strong are these concerns to you at this point in your career? Rate each statement according to the following scale.

1 = No Concern      2 = Little Concern      3 = Some Concern      4 = Considerable Concern      5 = Great Concern

	1	2	3	4	5
1. Clarifying my ideas about the type of work I would really enjoy.	<input type="radio"/>				
2. Deciding what I want to do for a living.	<input type="radio"/>				
3. Finding the line of work I am best suited for.	<input type="radio"/>				
4. Learning about beginning jobs that might be open to me.	<input type="radio"/>				
5. Identifying the skills required for jobs that interest me.	<input type="radio"/>				
6. Choosing the best among the occupations I am considering.	<input type="radio"/>				
7. Choosing the most challenging job among those that interest me.	<input type="radio"/>				
8. Finding a line of work that really interests me.	<input type="radio"/>				
9. Making sure of my occupational choice.	<input type="radio"/>				
10. Choosing a job that will really satisfy me.	<input type="radio"/>				
11. Getting started in my chosen occupational field.	<input type="radio"/>				
12. Deciding how to qualify for the work I want to do.	<input type="radio"/>				
13. Meeting people who can help me get started in my chosen field.	<input type="radio"/>				
14. Finding opportunities to do work that I really like.	<input type="radio"/>				
15. Making specific plans to achieve my current career goals.	<input type="radio"/>				
16. Settling down in a job I can stay with.	<input type="radio"/>				
17. Making a place for myself where I work.	<input type="radio"/>				
18. Doing things to help me stay in the field in which I have started.	<input type="radio"/>				
19. Achieving stability in my occupation.	<input type="radio"/>				
20. Getting established in my work.	<input type="radio"/>				
21. Consolidating my current position.	<input type="radio"/>				
22. Developing a reputation in my line of work.	<input type="radio"/>				
23. Becoming a dependable producer.	<input type="radio"/>				
24. Becoming especially knowledgeable or skillful in my work.	<input type="radio"/>				
25. Winning the support of my employer, colleagues, or clients.	<input type="radio"/>				
26. Planning how to get ahead in my established field of work.	<input type="radio"/>				
27. Improving my chances of advancement in my current occupation.	<input type="radio"/>				
28. Doing the things that make people want me in my work.	<input type="radio"/>				
29. Finding ways of making my competence known.	<input type="radio"/>				
30. Advancing to a more responsible position.	<input type="radio"/>				
31. Maintaining the occupational position I have achieved.	<input type="radio"/>				
32. Holding my own against the competition of new people entering the field.	<input type="radio"/>				
33. Adapting to changes introduced since I got established in my occupation.	<input type="radio"/>				
34. Keeping in tune with the people I work with.	<input type="radio"/>				
35. Keeping the respect of people in my field.	<input type="radio"/>				
36. Keeping up with new knowledge, equipment, and methods in my field.	<input type="radio"/>				
37. Attending meetings and seminars on new methods.	<input type="radio"/>				
38. Visiting places where I can see new developments.	<input type="radio"/>				
39. Getting to know important people in my field.	<input type="radio"/>				
40. Getting refresher training to keep up.	<input type="radio"/>				
41. Identifying new problems to work on.	<input type="radio"/>				
42. Finding out about new opportunities as my field changes.	<input type="radio"/>				
43. Deciding what new fields to open up or develop.	<input type="radio"/>				
44. Developing new skills to cope with changes in my field.	<input type="radio"/>				
45. Developing new knowledge or skills to help me improve my work.	<input type="radio"/>				

Number 46 and 47 require you to evaluate your current career status and situation.

46. After working in a field for a while, many persons shift to another job for any of a variety of reasons: pay, satisfaction, opportunity for growth, shut-down, etc. When the shift is a change in field, not just working for another employer in the same field, it is commonly called a "career change." Following are five statements which represent various stages in career change. Choose the one statement that best describes your current status.
- I am considering making a career change.
  - I am considering whether to make a career change.
  - I plan to make a career change and am choosing a field to change to.
  - I have selected a new field and am trying to get started in it.
  - I have recently made a change and am settling down in the new field.
47. Current Job and Career Satisfaction (Check the appropriate responses)  
How do you feel about
- a. Your Present employment?
    - Very Satisfied
    - Satisfied
    - Somewhat Dissatisfied
    - Dissatisfied
  - b. Your overall career progress to date?
    - Very Satisfied
    - Satisfied
    - Somewhat Dissatisfied
    - Dissatisfied
  - c. Your future career prospects?
    - Very Satisfied
    - Satisfied
    - Somewhat Dissatisfied
    - Dissatisfied

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**IV. COMMENTS:** Please offer any comments to clarify your responses on this survey or to provide feedback to the researcher.

Thank you for completing this survey. Your time is appreciated!  
Please fold and staple this questionnaire before placing it in the mail.

APPENDIX D

Liberal Arts and Sciences Alumni Survey  
Class of 1986

Final Version

**Virginia Tech**  
**Liberal Arts and Sciences Alumni Survey**  
**Class of 1986**

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November 21, 1987

Dear Tech Alumnus:

"What job am I qualified for with my major?" "I want to make an appropriate occupational choice. What can I do or what can I read to assist me with this critical decision?" These questions may sound familiar to you, for as you are aware, the career decision making process for many liberal arts and science students is a difficult one.

Your participation in this alumni study will assist in an effort to provide meaningful information to current and prospective students as they explore occupational options. This questionnaire asks you to recall specific aspects of your college experience as well as to consider current career concerns you might have. Completing the survey will only require 10 to 15 minutes of your time and may prove to be interesting.

A successful rate of return is critical to the results of this study. Please complete the survey as soon as possible and return it in the enclosed stamped envelope. Your responses will be treated confidentially; only group results will be reported. The identification number on the survey will be used for the purpose of removing your name from the mailing list when the survey is returned.

If you have any questions pertaining to this questionnaire, please call or write. I can be reached at either (703) 961-6241 or 961-2374.

Thank you. Your time and interest are greatly appreciated!

Sincerely,

Donna E. Cassell  
Placement Counselor  
University Placement Services



**Did you PARTICIPATE in the following activities?**  
(Check Responses)

<b>1. Educational Experiences</b> (out-of-the-classroom activities, programs, and experiences)	<b>No</b>	<b>Yes</b>
Practicum or internship for credit.....	0	0
Student teaching.....	0	0
ROTC program.....	0	0
Met with career or placement counselor, academic or career adviser..... about career concerns	0	0
Attended workshop or seminar on career related topics.....	0	0
Completed career assessment, interest, or personality inventory.....	0	0
Used written materials on career topics.....	0	0
Used computer programs for career planning purposes (e.g. SIGI, Virginia VIEW).....	0	0
Other: _____	0	0
Other: _____	0	0

<b>2. Paid Work Experience</b>	<b>No</b>	<b>Yes</b>
Paid internship during school year.....	0	0
Part-time paid internship during summer.....	0	0
Full-time paid internship during summer.....	0	0
Cooperative education.....	0	0
Work-Study position.....	0	0
Full-time job during summer.....	0	0
Part-time job during summer.....	0	0
Full-time job during school year (other than Coop).....	0	0
Part-time job during school year (other than Work-Study).....	0	0
Other: _____	0	0
Other: _____	0	0

**3. Leisure and Volunteer Activities/Non-paid Experiences**  
Use the following scale to indicate the average number of hours per week you participated in the organizations and activities listed during your junior and senior years.

- |                                     |                                     |
|-------------------------------------|-------------------------------------|
| a = None                            | d = 6-10 hours per week             |
| b = Less than (<) one hour per week | e = More than (>) 10 hours per week |
| c = 1-5 hours per week              |                                     |

	(a) None	(b) < 1	(c) 1-5	(d) 6-10	(e) > 10
<b>On-Campus Activities:</b>					
Service organization (e.g. Circle K, Alpha Phi Omega).....	0	0	0	0	0
Social organization (e.g. fraternity or sorority).....	0	0	0	0	0
Religious organization (e.g. BSU, Navigators).....	0	0	0	0	0
Academic club (e.g. Poli Sci club, Bio Chem club).....	0	0	0	0	0
Professional society (e.g. Pre-Law Society).....	0	0	0	0	0
Intramural or club sports (e.g. lacrosse, volleyball).....	0	0	0	0	0
Intercollegiate Athletics.....	0	0	0	0	0
Residence hall council.....	0	0	0	0	0
Other: _____	0	0	0	0	0
Other: _____	0	0	0	0	0
<b>Off-Campus Activities:</b>					
Civic organization (e.g. rescue squad).....	0	0	0	0	0
Church organization.....	0	0	0	0	0
Volunteer with service program (e.g. Big Brothers, tutoring).....	0	0	0	0	0
Active with hobby or interest area (e.g. flower arrangement, pro-life).....	0	0	0	0	0
Other: _____	0	0	0	0	0
Other: _____	0	0	0	0	0



### III. CAREER CONCERNS INVENTORY

This portion of the survey consists of 45 career concerns and requires you to consider your current working career. How strong are these concerns to you at this point in your career? Rate each statement according to the following scale and check your response.

1. No Concern      2. Little Concern      3. Some Concern      4. Considerable Concern      5. Great Concern

	1	2	3	4	5
1. Clarifying my ideas about the type of work I would really enjoy. ....	O	O	O	O	O
2. Deciding what I want to do for a living. ....	O	O	O	O	O
3. Finding the line of work I am best suited for. ....	O	O	O	O	O
4. Learning about beginning jobs that might be open to me. ....	O	O	O	O	O
5. Identifying the skills required for jobs that interest me. ....	O	O	O	O	O
6. Choosing the best among the occupations I am considering. ....	O	O	O	O	O
7. Choosing the most challenging job among those that interest me. ....	O	O	O	O	O
8. Finding a line of work that really interests me. ....	O	O	O	O	O
9. Making sure of my occupational choice. ....	O	O	O	O	O
10. Choosing a job that will really satisfy me. ....	O	O	O	O	O
11. Getting started in my chosen occupational field. ....	O	O	O	O	O
12. Deciding how to qualify for the work I want to do. ....	O	O	O	O	O
13. Meeting people who can help me get started in my chosen field. ....	O	O	O	O	O
14. Finding opportunities to do work that I really like. ....	O	O	O	O	O
15. Making specific plans to achieve my current career goals. ....	O	O	O	O	O
16. Settling down in a job I can stay with. ....	O	O	O	O	O
17. Making a place for myself where I work. ....	O	O	O	O	O
18. Doing things to help me stay in the field in which I have started. ....	O	O	O	O	O
19. Achieving stability in my occupation. ....	O	O	O	O	O
20. Getting established in my work. ....	O	O	O	O	O
21. Consolidating my current position. ....	O	O	O	O	O
22. Developing a reputation in my line of work. ....	O	O	O	O	O
23. Becoming a dependable producer. ....	O	O	O	O	O
24. Becoming especially knowledgeable or skillful in my work. ....	O	O	O	O	O
25. Winning the support of my employer, colleagues, or clients. ....	O	O	O	O	O
26. Planning how to get ahead in my established field of work. ....	O	O	O	O	O
27. Improving my chances of advancement in my current occupation. ....	O	O	O	O	O
28. Doing the things that make people want me in my work. ....	O	O	O	O	O
29. Finding ways of making my competence known. ....	O	O	O	O	O
30. Advancing to a more responsible position. ....	O	O	O	O	O
31. Maintaining the occupational position I have achieved. ....	O	O	O	O	O
32. Holding my own against the competition of new people entering the field. ....	O	O	O	O	O
33. Adapting to changes introduced since I got established in my occupation. ....	O	O	O	O	O

- 34. Keeping in tune with the people I work with.....O O O O O
- 35. Keeping the respect of people in my field.....O O O O O
- 36. Keeping up with new knowledge, equipment, and methods in my field... O O O O O
- 37. Attending meetings and seminars on new methods.....O O O O O
- 38. Visiting places where I can see new developments.....O O O O O
- 39. Getting to know important people in my field.....O O O O O
- 40. Getting refresher training to keep up.....O O O O O
- 41. Identifying new problems to work on.....O O O O O
- 42. Finding out about new opportunities as my field changes.....O O O O O
- 43. Deciding what new fields to open up or develop.....O O O O O
- 44. Developing new skills to cope with changes in my field.....O O O O O
- 45. Developing new knowledge or skills to help me improve my work.....O O O O O

Number 46 and 47 require you to evaluate your current career situation.

46. Following are five statements which represent various stages in career change. Choose the one statement that best describes your current status.

- I am not considering making a career change.
- I am considering whether to make a career change.
- I plan to make a career change and am choosing a field to change to.
- I have selected a new field and am trying to get started in it.
- I have recently made a change and am settling down in the new field.

47. Current Job and Career Satisfaction (Check the appropriate responses)

How do you feel about

(a) Your Present employment?

- Very Satisfied
- Satisfied
- Somewhat Dissatisfied
- Dissatisfied

(b) Your overall career progress to date?

- Very Satisfied
- Satisfied
- Somewhat Dissatisfied
- Dissatisfied

(c) Your future career prospects?

- Very Satisfied
- Satisfied
- Somewhat Dissatisfied
- Dissatisfied

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**Thank you for completing this survey. Your time is appreciated!**

APPENDIX E  
Survey Follow-up Post Card

University Placement Services  
Virginia Tech  
Blacksburg, VA 24061-0128  
December 7, 1987

Dear 1986 Virginia Tech Graduate:

Your completed Liberal Arts and Sciences Alumni Survey has not been received. This was sent to your home address during the Thanksgiving holiday. Your participation in this study is important; the results will assist Liberal Arts and Sciences students with career exploration and decisions. If you have not yet responded, please take 10 to 15 minutes, at your earliest convenience, to complete and return the survey.

If you have misplaced your survey or have any questions, feel free to call me at (703) 961-6241 or 961-1274. Thank you for your time and interest.

Sincerely,

Donna E. Cassell  
Placement Counselor

APPENDIX F  
Survey Code Book

## Survey Coding System

### Date Received

November 22 through November 28.....	1
November 29 through December 5.....	2
December 6 through December 12.....	3
December 13 through December 19.....	4
December 20 through December 26.....	5
December 27 through January 2.....	6
January 3 through January 9.....	7
January 10 through January 16.....	8
January 17 through January 23+.....	9

### I. Background Information

#### Major Categories (MAJ)

Humanities.....	1
Social Studies.....	2
Natural Sciences.....	3
Math Sciences.....	4

#### Quality Credit Average (QCA)

3.50 - 4.00.....	4
3.00 - 3.49.....	3
2.50 - 2.99.....	2
2.00 - 2.49.....	1

#### Current Employment Status

Yes.....	1
No.....	0

Number of Jobs Held Since Graduation=# given by subject

#### Father's Educational Background

Less than high school.....	1
High school degree.....	2
Some college.....	3
Bachelor's degree.....	4
Graduate work or degree.....	5

**Mother's Educational Background**

Less than high school.....	1
High school degree.....	2
Some college.....	3
Bachelor's degree.....	4
Graduate work or degree.....	5

**Gender (GEN)**

Female.....	1
Male.....	0

**II. Student Involvement in Out-of-Class Activities**

**Participation in Educational and Work Experiences**

No.....	0
Yes.....	1

**Participation in Leisure and Volunteer Activities**

	Weights
(a) None.....	0
(b) < 1.....	0.5
(c) 1 - 5.....	3
(d) 6 - 10.....	8
(e) > 10.....	15

**Importance of Educational, Work, and Leisure Activities**

1.....	1
2.....	2
3.....	3
4.....	4
5.....	5

**III. Career Concerns Inventory**

**Career Development Status (STAT): Items 1 - 45**

1.....	0
2.....	1
3.....	2
4.....	3
5.....	4

**Career Stability (STAB): Item 46**

- I am not considering making a career change.....1
- I am considering whether to make a career change..2
- I plan to make a career change and am choosing  
a field to change to.....3
- I have selected a new field and am trying to get  
started in it.....4
- I have recently made a change and am settling  
down in a new field.....5

**Job Satisfaction (SAT): Items 47a, 47b, 47c**

How do you feel about

(a) Your present employment?

- Very satisfied.....4
- Satisfied.....3
- Somewhat dissatisfied.....2
- Dissatisfied.....1

(b) Your overall career progress?

- Very satisfied.....4
- Satisfied.....3
- Somewhat dissatisfied.....2
- Dissatisfied.....1

(c) Your future career prospects?

- Very satisfied.....4
- Satisfied.....3
- Somewhat dissatisfied.....2
- Dissatisfied.....1

Military Status (Determined by current job title)

Military position.....M  
Non-military.....N

APPENDIX G

Positions Held One and a Half Years After Graduation

1986 Liberal Arts and Science  
Spring Graduates

Positions Held One and a Half Years After Graduation

Major(s)	Position
Art	Artist Illustrator
Art	Assistant Fashion Coordinator
Art	Graphic Designer
Biochemistry	Research Technician III
Biochemistry	Sales Representative
Biology/Communications	Sales Representative-Dictaphone
Biology	Lab Technician
Biology	Life Science Teacher
Biology	Assistant Lab Director
Biology	Technical Specialist
Biology	Research & Development Coordinator
Chemistry	Chef
Chemistry	Research Chemist
Chemistry	Chemistry Technician
Chemistry	Bio Lab Technician
Chemistry	Associate Scientist
Chemistry	Quality Control Supervisor
Chemistry	Chemist
Communications/Biology	Sales Representative - Dictaphone
Communications/English	TV Production Specialist
Communications	Lifestyles Reporter
Communications	Copy Editor
Communications	Business Reporter
Communications	Assistant Dept. Manager
Communications	Corporate Sales Representative
Communications	Newspaper Reporter
Communications	Circulation Assistant
Communications	Director of Sales
Communications	Sales Representative
Communications	Operations Coordinator
Communications	Meeting Planner
Communications	TV Reporter
Communications	Public Relations Assistant
Communications	Advertising Sales Representative
Communications	Video Production Assistant
Communications	Production Assistant
Communications	Retail Advertising Representative
Communications	Media Planner/Buyer

Communications  
Communications

Computer Science/Physics  
Computer Science  
Computer Science

Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science  
Computer Science

Coordinator  
Marketing Assistant  
Corporate Sales Representative  
Anchor/TV Reporter  
Systems Analyst  
Editorial Assistant  
Projectionist/Production Asst.  
Staff Writer  
AM Announcer  
Pilot  
Sales-Telemarketing  
Assistant Account Executive  
Advertising Manager  
Salesman  
Communications Operator  
Inventory Manager  
Marketing Assistant  
Business Manager  
Production Control Technician  
Television Producer  
Administrative Assistant  
Production Coordinator  
Marketing Assistant  
Reporter

Programmer/Analyst  
Professional Musician  
Programmer  
Associate Consultant  
Computer Analyst  
Software Engineer  
Programmer Analyst  
Systems Manager

Software Engineer  
Programmer/Analyst  
Computer Programmer  
Technical Support Engineer  
Programmer/Analyst  
Consultant  
Programmer Analyst  
Computer Programmer  
Computer Analyst  
Computer Analyst  
Computer Analyst/Consultant  
Analyst  
Programmer/Analyst  
Systems Manager  
Electronics Engineer  
Computer Scientist  
Computer Analyst

Computer Science	Programmer/Analyst
Computer Science	Programmer/Analyst
Computer Science	Programmer/Analyst
Computer Science	Technical Staff Member
Computer Science	Software Engineer
Computer Science	Associate Engineer
Computer Science	Programmer/Analyst
Computer Science	Programmer/Analyst
Computer Science	Senior Software Analyst
Computer Science	Programmer/Analyst
Computer Science	Computer Systems Intern
Computer Science	Associate Engineer
Computer Science	Software Analyst
Computer Science	Programmer/Analyst I
Computer Science	Programmer
Computer Science	Associate Programmer
Computer Science	Telemarketer
Computer Science	Programmer/Analyst
Computer Science	Engineer
Computer Science	Programmer/Analyst
Computer Science	Software Engineer
Economics/English	Sales Representative
Economics	Business Manager-Auto Dealership
Economics/Political Science	Ensign-US Navy
Economics	Supply Specialist
Economics	Actor
Economics	Legal Assistant
English	Assistant Manager
English/Communications	TV Production Specialist
English/Economics	Sales Representative
English/Spanish	Computer Systems Manager
English	Technical Writer
English	Leasing Consultant
English	2nd Lt-USAF
English	Reference/Circulation Assistant
English	Intern with 3rd World Aid Organization
English	English Teacher
English	Marketing Representative
English	Library Aid
English	Regional Account Coordinator
English	Teacher
French/International Studies	Substitute Teacher
Geography	Naval Officer
Geography	Technical Supervisor for Mapping Firm
Geography	Transportation Planner
Geography	Cartographer
Geography	Assistant Librarian/Newspaper

Geology	Earth Science Teacher
Geophysics	Underground Utility Locator
History/Mathematics	Ensign, US Navy
History	Lt-US Army
History	Buyer/Salesman/Manager
History	Platoon Leader, US Army
History	Naval Officer
History	Corporate Inventory Control Manager
History	Systems Engineer
History	Pharmacy Technician
History	Lt. US Army
History	Sales
History	English Assistant Historian
History	Instrument Man
History	Officer, US Marine Corps
International Studies	Administrative Assistant
International Studies/French	Substitute Teacher
International Studies/Poli. Sci.	Cryptologic/Linguist
Liberal Arts and Science	Assistant Women's Basketball Coach
Liberal Arts and Science	Dispatch Technician
Liberal Arts and Science	Retirement Disability Claims Specialist
Liberal Arts and Science	Marketing Coordinator
Mathematics/History	Ensign, US Navy
Mathematics/Physics	Mathematician
Mathematics	Marine Corps Officer
Mathematics	Computer Programmer
Mathematics	Programmer Analyst
Mathematics	Fire Direction Officer, US Army
Mathematics	Systems Analyst/Programmer
Mathematics	Actuarial Analyst
Mathematics	Teacher
Mathematics	Programmer/Analyst II
Mathematics	Programmer
Mathematics	Capacity Planning
Mathematics	Engineer
Nuclear Science	Naval Aviator
Nuclear Science	Graduate Research Assistant
Nuclear Science	Electronic Engineer
Philosophy	Self Employed/Small Business
Physics	Pilot-USAF
Physics/Computer Science	Programmer/Analyst
Physics	Associate Scientist/Programmer

Physics/Mathematics

Political Science/Economics  
Political Science  
Political Science  
Political Science  
Political Science  
Political Science  
Political Science/Internat. Stud.  
Political Science  
Political Science  
Political Science  
Political Science  
Political Science  
Political Science  
Political Sci  
Political Science  
Political Science

Psychology  
Psychology

Sociology  
Sociology  
Sociology  
Sociology  
Sociology

Spanish/English  
Spanish  
Spanish  
Spanish  
Spanish  
Spanish

Statistics

Urban Affairs  
Urban Affairs

Mathematician

Ensign-US Navy  
Imagery Analyst  
Human Resources Developer  
Bank Representative  
Employment Trainer/Counselor  
Air Force Pilot  
Cryptologic Linguist  
Inventory Management Specialist  
Tank Platoon Leader US Army  
Commander-USAF  
President-Construction Co.  
Paralegal Supervisor  
Projected Retail Operations Manager  
Compliance analyst  
Financial Analyst  
Bookkeeper

Computer Technician  
Vocational Assistant  
Production Manager  
Paralegal  
Child-Care Worker  
Personnel Consultant/Recruiter  
Administrative Assistant  
Junior Buyer  
Military Personnel Specialist  
Group Sales  
Counselor  
Habilitation Assistant

Temporary Work-Payroll  
Electrician  
Typist  
ATM Specialist  
Clerk Typist

Computer Systems Manager  
Spanish Teacher  
Data Entry Clerk  
Service Representative  
Army Officer  
Teacher

Analyst

Volunteer Coordinator Assistant  
Regional Planner

APPENDIX H

Mean Scores for Career Task Categories and Differential  
Career Status Scores

**Mean Scores for Respondent Career Task Categories  
and the Diffenential Career Status Score**

RESPONDENT	C1	C2	C3	DCSS
1	.	.	.	.
2	13.3333	17.50	18.5	0.36964
3	9.3333	12.50	13.0	0.37929
4	.	.	.	.
5	7.3333	9.75	9.5	0.30390
6	16.3333	16.50	14.0	-0.14131
7	13.3333	13.25	12.5	-0.06285
8	11.0000	11.25	11.0	0.00051
9	15.3333	16.50	20.0	0.28821
10	9.0000	8.50	11.5	0.29739
11	16.0000	14.00	16.0	0.01786
12	4.6667	7.00	4.0	0.07143
13	16.3333	10.50	11.0	-0.30952
14	15.6667	17.75	14.0	-0.07829
15	15.0000	14.00	12.5	-0.17381
16	3.0000	9.50	11.0	2.32456
17	10.0000	15.50	14.5	0.48548
18	12.0000	10.50	10.0	-0.17262
19	9.3333	8.25	8.0	-0.14637
20	18.3333	19.50	16.5	-0.09021
21	.	.	.	.
22	15.6667	14.25	16.5	0.06747
23	11.0000	5.25	6.0	-0.37987
24	10.3333	10.75	9.5	-0.07596
25	.	.	.	.
26	16.0000	18.50	19.0	0.18328
27	13.0000	12.75	9.0	-0.31335
28	19.6667	18.75	18.0	-0.08661
29	18.0000	12.00	11.0	-0.41667
30	15.3333	17.75	12.0	-0.16633
31	14.0000	8.25	16.0	0.52868
32	10.3333	8.50	7.5	-0.29507
33	20.0000	19.50	16.5	-0.17885
34	14.3333	19.25	17.0	0.22614
35	19.0000	17.25	14.0	-0.28051
36	12.3333	13.00	10.0	-0.17672
37	10.6667	17.75	17.5	0.64998
38	12.6667	14.00	8.5	-0.28759
39	17.0000	14.00	18.0	0.10924
40	8.0000	10.00	14.0	0.65000
41	12.0000	18.75	19.5	0.60250
42	18.3333	10.50	6.5	-0.80823
43	15.3333	10.50	8.0	-0.55331
44	14.6667	10.50	15.5	0.19210
45	2.6667	18.25	19.0	5.88485

46	1.6667	4.00	0.5	0.52500
47	13.0000	14.50	19.5	0.46021
48	6.3333	19.25	20.0	2.07843
49	11.3333	13.00	17.0	0.45475
50	7.0000	10.50	8.0	0.26190
51	13.6667	16.50	16.0	0.17701
52	14.3333	12.25	9.0	-0.41065
53	19.3333	17.25	15.0	-0.23819
54	13.0000	13.25	15.0	0.15131
55	17.0000	19.25	20.0	0.17131
56	12.0000	17.50	14.0	0.2583
57	17.0000	10.75	11.0	-0.3444
58	13.6667	14.75	14.0	0.0284
59	17.3333	13.75	17.0	0.0296
60	11.3333	16.00	10.0	0.0368
61	9.6667	10.25	14.5	0.4750
62	11.0000	14.50	14.0	0.2837
63	18.0000	15.75	18.0	0.0179
64	6.6667	13.75	7.5	0.6080
65	13.6667	11.00	15.0	0.1685
66	9.6667	9.50	2.5	-0.7541
67	.	.	.	.
68	12.3333	13.25	9.5	-0.2087
69	4.3333	8.75	6.0	0.7049
70	13.0000	12.50	17.0	0.3215
71	6.3333	0.25	3.5	12.0395
72	14.3333	8.75	10.0	-0.2467
73	.	.	.	.
74	17.3333	14.00	8.0	-0.6209
75	17.3333	13.00	20.0	0.2885
76	8.6667	1.50	3.0	0.1731
77	13.0000	13.25	14.0	0.0758
78	16.6667	9.25	11.0	-0.2558
79	15.0000	16.25	12.0	-0.1782
80	17.3333	14.75	14.0	-0.1999
81	9.6667	17.00	18.0	0.8174
82	14.0000	18.00	8.5	-0.2421
83	17.0000	15.75	15.5	-0.0894
84	19.6667	9.75	3.0	-1.1965
85	4.6667	11.75	13.0	1.6242
86	11.3333	16.00	14.5	0.3180
87	2.6667	16.25	16.5	5.1091
88	7.3333	17.50	19.0	1.4721
89	0.6667	10.75	8.0	14.8692
90	14.6667	7.50	8.5	-0.3553
91	13.6667	10.75	17.0	0.3680
92	15.0000	17.00	11.5	-0.1902
93	14.3333	7.50	12.0	0.1233
94	13.6667	15.75	14.0	0.0413
95	15.3333	12.25	10.5	-0.3439
96	14.3333	15.00	14.0	-0.0202

97	3.0000	10.00	9.5	2.2833
98	13.3333	12.50	11.5	-0.1425
99	6.6667	11.50	14.5	0.9859
100	16.0000	18.50	17.5	0.1022
101	11.0000	18.75	16.0	0.5579
102	18.0000	12.25	16.0	-0.0133
103	18.0000	11.75	14.5	-0.1132
104	10.6667	11.00	11.0	0.0313
105	16.3333	13.00	13.5	-0.1656
106	13.3333	9.75	10.0	-0.2431
107	.	.	.	.
108	2.0000	3.25	6.5	1.6250
109	3.6667	14.50	19.0	3.2649
110	16.3333	17.00	18.5	0.1291
111	16.6667	16.00	12.0	-0.2900
112	13.3333	11.00	9.5	-0.3114
113	10.3333	14.75	11.0	0.1732
114	11.6667	19.00	17.0	0.5233
115	14.6667	12.00	18.0	0.3182
116	13.3333	10.00	9.5	-0.3000
117	10.6667	15.00	16.0	0.4729
118	17.3333	12.50	7.5	-0.6788
119	17.3333	14.00	14.0	-0.1923
120	17.0000	14.25	13.5	-0.2144
121	20.0000	10.50	19.0	0.3345
122	9.3333	12.50	12.0	0.2993
123	18.0000	14.75	14.0	-0.2314
124	17.0000	18.25	20.0	0.1694
125	3.3333	12.50	12.0	2.7100
126	6.3333	11.00	10.0	0.6459
127	3.6667	5.75	6.0	0.6117
128	13.0000	14.00	15.0	0.1484
129	13.3333	13.75	12.5	-0.0597
130	15.3333	6.00	10.5	0.1413
131	18.0000	18.25	15.5	-0.1368
132	12.0000	9.50	11.5	0.0022
133	.	.	.	.
134	17.3333	18.50	18.0	0.0403
135	14.3333	17.00	12.5	-0.0787
136	10.6667	3.75	5.5	-0.1818
137	1.6667	11.25	13.0	5.9056
138	13.0000	12.75	13.0	0.0004
139	10.3333	13.00	14.0	0.3350
140	2.0000	14.25	12.0	5.9671
141	5.0000	6.00	9.5	0.7833
142	7.3333	15.25	8.0	0.6041
143	12.0000	10.25	12.5	0.0737
144	19.0000	11.75	9.5	-0.5731
145	10.3333	13.25	10.5	0.0747
146	5.6667	10.50	12.0	0.9958
147	4.3333	17.00	9.0	2.4525

148	12.0000	14.25	13.0	0.0998
149	10.6667	11.25	7.5	-0.2786
150	15.0000	12.00	12.5	-0.1583
151	18.3333	18.50	18.5	0.0091
152	20.0000	19.50	19.5	-0.0250
153	.	.	.	.
154	12.6667	16.25	12.5	0.0521
155	14.0000	1.00	13.0	11.0714
156	17.6667	17.75	11.0	-0.3756
157	18.0000	2.00	1.5	-1.1389
158	14.0000	16.25	14.0	0.0223
159	7.3333	13.50	15.5	0.9891
160	1.3333	1.50	2.5	0.7917
161	14.3333	14.00	9.5	-0.3447
162	15.3333	12.50	12.0	-0.2248
163	.	.	.	.
164	16.6667	19.00	15.5	-0.0442
165	6.6667	4.25	5.5	-0.0684
166	3.0000	14.00	13.0	3.5952
167	7.6667	13.25	15.5	0.8981
168	12.0000	18.50	16.5	0.4336
169	16.3333	17.00	19.5	0.1879
170	11.0000	14.00	13.5	0.2370
171	10.6667	10.75	12.0	0.1241
172	17.0000	5.75	6.0	-0.6183
173	19.0000	14.50	20.0	0.1425
174	4.3333	3.75	5.0	0.1987
175	12.0000	14.50	10.5	-0.0675
176	13.0000	8.75	9.5	-0.2412
177	17.6667	19.75	20.0	0.1306
178	18.0000	18.00	19.5	0.0833
179	8.6667	11.50	14.5	0.5878
180	0.0000	4.00	2.0	.
181	0.6667	16.75	17.0	24.1399
182	9.6667	11.25	10.0	0.0527
183	6.6667	11.50	8.5	0.4641
184	10.3333	8.75	10.0	-0.0104
185	11.0000	10.50	9.5	-0.1407
186	5.0000	13.50	14.5	1.7741
187	15.6667	10.00	10.5	-0.3117
188	.	.	.	.
189	3.0000	15.25	14.0	4.0014
190	18.3333	13.00	7.0	-0.7524
191	14.0000	17.50	15.0	0.1071
192	6.3333	7.75	6.5	0.0624
193	2.6667	12.00	10.0	3.3333
194	15.0000	15.25	18.0	0.1970
195	16.3333	16.75	19.5	0.1897
196	16.6667	5.75	7.0	-0.4376
197	5.6667	13.25	10.0	1.0930
198	12.3333	12.00	9.0	-0.2770

199	3.0000	1.75	3.5	0.5833
200	17.0000	8.50	17.0	0.5000
201	12.3333	1.00	0.0	-1.9189
202	6.3333	12.00	11.0	0.8114
203	8.3333	10.50	6.5	-0.1210
204	13.6667	11.25	11.0	-0.1991
205	13.3333	9.75	14.0	0.1671
206	4.3333	2.75	4.0	0.0892
207	20.0000	17.00	20.0	0.0265
208	15.3333	18.50	16.0	0.0714
209	16.6667	14.25	15.5	-0.0573
210	9.3333	10.75	12.0	0.2681
211	12.0000	14.25	6.5	-0.3564
212	9.6667	12.25	13.0	0.3285
213	17.3333	11.75	11.0	-0.3859
214	6.6667	13.00	11.0	0.7962
215	12.6667	13.75	11.0	-0.1145
216	12.0000	11.50	13.5	0.1322
217	10.6667	16.50	11.0	0.2135
218	16.0000	15.50	20.0	0.2591
219	14.0000	15.25	15.0	0.0729
220	15.0000	12.25	11.0	-0.2854
221	17.0000	16.75	13.5	-0.20874
222	17.0000	12.25	11.0	-0.38145
223	18.3333	15.00	13.5	-0.28182
224	.	.	.	.
225	16.3333	10.50	12.0	-0.21429
226	12.0000	5.50	15.0	1.18561
227	15.3333	15.50	13.0	-0.15042
228	18.6667	7.25	5.0	-0.92195
229	6.0000	15.75	11.5	1.35516
230	6.6667	17.25	13.5	1.37011
231	14.6667	9.75	9.5	-0.36087
232	13.6667	16.00	14.0	0.04573
233	.	.	.	.
234	6.3333	14.50	17.0	1.46189

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