

# CAREER EXPLORATORY BEHAVIORS OF POSTSECONDARY AGRICULTURE STUDENTS

*Levon T. Esters, Assistant Professor*  
*Rachel E. McCulloh, Undergraduate Research Assistant*  
Iowa State University

## Abstract

*The purpose of this study was to explore the extent of career exploratory behaviors of students enrolled in Iowa State University's College of Agriculture and Life Sciences. Career exploration was measured using the self and environmental exploration scales of the Career Exploration Survey (CES; Stumpf, Colarelli, Hartmann, 1983). A MANOVA indicated significant main effects for year in school for the environmental and self exploration scales. For both the environmental and self exploration scales, seniors scored significantly higher than freshmen, indicating greater use of these career exploration strategies in the career exploration process. Findings of this study were consistent with theory and research suggesting that college students are primarily in the exploration phase of career development. Recommendations and implications for students enrolled in postsecondary programs of agriculture are presented.*

## Introduction

Career development has always been an important component of the postsecondary educational experience (Hitch & Gore, 2005). Career development refers to the lifelong psychological and behavioral processes, as well as contextual influences, that shape one's career (Niles & Harris-Bowlsbey, 2002). Hence, career development involves an individual's work values, choice of occupation(s), creation of a career pattern, and decision-making style (Herr, Cramer, & Niles, 2004). Agricultural education has long emphasized the role of career development at the secondary level. For example, the popular teaching methods textbook, *Handbook on Agricultural Education in Public Schools* (Phipps & Osborne, 1988), considers helping students to make career decisions a vital component of managing an agricultural education program. However, the career development needs of students enrolled in post-secondary programs of agriculture have been receiving greater attention in the literature. This is primarily due to concerns about high school students' decisions to pursue the agricultural sciences as an academic major and career option.

Students in higher education frequently perceive career development issues as paramount over academic or personal needs (Herr et al., 2004). However, goals for career development in higher education should be such that all types of career concerns and needs are addressed. These career needs range from exploration of job opportunities related to majors, to development of job-seeking skills, to general issues of career preparation, decision-making, and choice. At the college level, it is likely that most students will have broad and basic understandings of the occupational structure. Many students, however, may need help in exploring specific segments of that structure in personally relevant terms (e.g., What work is related to a given major? What is the employment outlook in a specific occupational field? What are the diverse opportunities available within a single chosen field?) (Herr et al.). Moreover, it is important that students have knowledge about themselves, their skills, what interests them, and what may fit their individual characteristics and needs (Smith & Fouad, 1999). Specifically, issues related to career exploration are the driving force behind these types of career concerns posed by college students.

Career exploration has been widely recognized and endorsed as a necessary next step in an individual's career development (Phillips, 1982). Presumed to occur primarily during adolescence and young adulthood (Super, 1963), participation in exploratory activities promotes an understanding of self and environment that enables people to develop realistic vocational goals (Sugalski & Greenhaus, 1986). Not only can exploratory behavior have positive consequences in terms of career development (Sharf, 2006), but it builds on other exploratory behavior, which eventually leads to an increased likelihood of successful career planning. Hence, few would argue that career-related decisions should be made without the benefit of prior exploration (Phillips).

The exploration stage is a crucial period in career development (Super, 1957) and is known as one of the cornerstones of choosing an occupation (Raskin, 1985; Vondracek, 1992). During this phase individuals initiate thoughts and behaviors that will likely lead to a future career choice (Bartley & Robitschek, 2000). If individuals do not successfully complete the tasks of this stage, they may flounder when it is time to enter and stabilize in an occupation. While it is recognized that exploration occurs at all ages and stages of development, it is considered to be most prominent during the late adolescence/early adulthood period (Super, 1957, 1980).

Career exploration generally is defined as those self-appraisal and external activities that provide individuals with information to foster progress in the selection of, entry into, and adjustment to an occupation (Blustein, 1989b; Jordann, 1963; Stumpf et al., 1983). Behaviors define the process of exploration (Stumpf et al., 1983). Career exploration is thought to be particularly important because of its ostensible role in providing individuals with the requisite levels of self-awareness and occupational knowledge needed to foster progress in the commitment to a vocational choice (Blustein, 1989a).

Research suggests that career exploration can help students learn more about themselves and the world of work (Taylor, 1985), choose occupations to pursue (Greenhaus, Hawkins, & Brenner,

1983), develop effective job search skills (Stumpf, Austin, & Hartman, 1984; Stumpf & Colarelli, 1981), and develop more realistic job expectations (Stumpf & Hartman, 1984). Studies also have revealed a variety of life-development contexts related to career exploration such as age (Ketterson & Blustein, 1997), gender (Blustein, 1988; Blustein & Phillips, 1988; Ketterson & Blustein; Taveira, Silva, Rodriguez, & Maia, 1998), socioeconomic conditions (Brown, Darden, Shelton, & Dipoto, 1999), and education (Afonso & Taveira, 2001).

A considerable amount of research has examined issues related to career development in agricultural education; however, most studies have focused on identifying students' career perceptions, aspirations, and choice. Considerably less is known about the extent of career exploratory behaviors of students enrolled in secondary or postsecondary programs of agriculture. Understanding the importance of career exploration cannot be overemphasized. For example, encouraging career exploration can be an important activity prior to assisting a student with career selection (Sharf, 2006). Further, although most scholars and practitioners in career development would agree that career exploration is a useful activity, research suggests there is much individual variation in the degree to which one explores (Jepsen, 1984). Given the lack of research on career exploration in agricultural education, this study represents an exploratory approach to identify the extent of career exploratory behaviors of students enrolled in postsecondary programs of agriculture.

### Conceptual Framework

In the past 40 years, much has been written about career exploration, including both theory and research (Bartley & Robitschek, 2000). Jordann (1963) is a key figure in the theorization of career exploration. He and his team initiated a line of work which has had and continues to have a tremendous influence on career exploration thinking and research (Taveria & Moreno, 2003). Specifically, Jordann theorized that exploration in general, and

career exploration in particular, would be influenced by personal traits and environmental conditions.

Building on these ideas, Stumpf et al. (1983) proposed an interactive model of vocational exploration, emphasizing three discrete aspects of exploration: 1) exploration beliefs (e.g., instrumentality and preference), 2) exploration process (e.g., where and how), and 3) reactions to exploration (e.g., affect and stress). This model suggested that these three categories interact in a reciprocal manner, resulting in unique exploration experiences for each individual (Bartley & Robitschek, 2000).

Stumpf et al. (1983) state that, "one can gather career information from a variety of sources, but two sources are major: the environment and oneself" (p. 192). Self-exploration is an examination of one's personal goals, values, skills, needs, and interest (Werbel, 2000). It concerns gathering information about the personal aspects related to making assessments of the person-environment fit of different employment opportunities. The second dimension of career exploration, environment exploration, is concerned with gathering information about the personal aspects of person-environment fit that will help to determine the job seeker's degree of interest in a given employment opportunity (Stumpf et al., 1983, as cited in Werbel, 2000). It may include gathering information to determine where different relevant job opportunities exist, demands of different types of work environments, and the nature of different types of organizational cultures.

### **Purpose/Objectives**

The purpose of this descriptive exploratory study was to examine the career exploratory behaviors of students enrolled in Iowa State University's College of Agriculture and Life Sciences. The objectives that guided this study were to:

1. Describe the demographic characteristics of students enrolled in a college of agriculture.
2. Describe the level of career exploration of students enrolled in a college of agriculture.

3. Describe the differences in the level of career exploration of students enrolled in a college of agriculture.

### **Methods/Procedures**

The target population for this study consisted of all freshmen and seniors ( $N = 1,284$ ) enrolled in Iowa State University's College of Agriculture and Life Sciences. A purposive sample of freshmen students enrolled in freshmen orientation courses and seniors enrolled in senior capstone/seminar courses from eight of 15 academic departments of the college were used in the study. Because the college of agriculture in this study had recently expanded to include disciplines non-traditional to the field of agriculture (e.g., biochemistry, biophysics, and molecular biology, genetics, development and cell biology), the researcher chose to survey students in departments that are common to most colleges of agriculture (e.g., animal science, horticulture, etc.). The final sample ( $n = 310$ ) consisted of freshmen ( $n = 130$ ) and senior ( $n = 180$ ) students from the following departments: agricultural education, agricultural and biosystems engineering, agricultural economics, agronomy, animal science, entomology, horticulture, and natural resources, ecology, and management.

The instrument used to collect data for the study consisted of the Career Exploration Survey (CES; Stumpf et al., 1983) and items requesting demographic information such as grade point average, race, home residence, and academic department. The CES is among the most significant and widely used measures of career exploration (Taveira & Moreno, 2003). The researcher measured both self and environmental exploration activities, a strategy consistent with research and theory in career development that has indicated a comprehensive definition of career exploration would need to incorporate self exploration and exploration of the external educational and vocational environment (Jepsen, 1984; Jordaan, 1963; Stumpf et al., 1983, as cited in Blustein & Phillips, 1988). Specifically, career exploration was measured by the original five-item Self-

Exploration (SE) scale and the six-item Environmental Exploration-Revised (EE-R) scale (Blustein, 1989b) adapted from the original CES Environmental Exploration measure. The Environmental Exploration scale and the Self-Exploration scale is comprised of six and five items, respectively, that respondents rate using a 5-point Likert-type scale ranging from 1 (*little*) to 5 (*a great deal*). Possible scores for environmental and self-exploration range from 6 to 30 and 5 to 25, respectively. Higher scores indicate greater use of respective career exploration strategies.

Blustein (1989b) noted this instrument was originally developed with people who were looking toward relatively imminent career transitions (e.g., graduate students, upper level undergraduate). The sample in this study included students who were generally at an earlier stage in the career decision-making process. Therefore, researchers used the versions developed by Blustein (1989b) with this population with minor rewording of several original items. The Environmental Exploration scale was revised by making minor modifications in the wording of three of the original six items. For example, the phrase, "related to my anticipated career area" was added to the following item, "Obtained information on specific jobs or companies." Blustein (1989b) reported internal consistency of .89 for the EE-R scale and a test-retest reliability coefficient of .85. Stumpf et al. (1983) reported internal consistency for the SE as .88. For the present study, internal consistency reliabilities were .84 (freshmen) and .90 (seniors) for Environment Exploration-Revised and .81 (freshmen) and .83 (seniors) for Self-Exploration. According to Blustein (1988), evidence of the construct validity of the CES scales can be inferred from a factor structure consistent with theoretical expectations and relationships between CES scorers and predicted outcomes.

Data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS version 15.0). Descriptive statistics including frequencies, percentages, means, and standard deviations were used to address objectives one and two. To address objective three, a factorial multivariate analysis of

variance (MANOVA) was used to describe differences in the level of career exploration by gender and year in school. The use of inferential statistics was based on the assumption that students included in this study were a time and place sample representative of past, present, and future undergraduate students of similar characteristics entering a college of agriculture (Oliver & Hinkle, 1981). Effect sizes (partial eta squared) were interpreted using Cohen's (1988) criteria.

## Results/Findings

### *Objective 1: Describe the demographic characteristics of students enrolled in a college of agriculture.*

Fifty-seven percent of the students in the study were seniors while 43% were freshmen. The majority of students were Caucasian (97%) and male (64%). Most students (57%) grew up on a farm or in a rural community, 27% were from towns or cities with populations of 10,000 or more people, 9% were from small towns of less than 2,500 people, and 7% were from towns of 10,001-50,000 people. Over half (51%) the students indicated they had a grade point average of 3.00 or higher, 35% reported a grade point average between 2.00 – 2.99, and 14% reported grade point averages of 2.49 and below. Because data for this study were collected during the fall 2005 semester, freshmen students had not established grade point averages. There were students representing each of the eight academic departments. Eighteen percent of the students in the study were enrolled in the departments of agricultural economics and natural resource, ecology, and management followed by agricultural biosystems engineering and animal science with 15%, and 14% from the horticulture department. Ten percent of the students indicated their majors were in the departments of agricultural education and agronomy.

### *Objective 2: Describe the level of career exploration of students enrolled in a college of agriculture.*

The second objective was to describe the level of career exploration of students in a

college of agriculture. In this study, career exploration was measured using both environmental and self exploration scales of the Career Exploration Survey (Stumpf et al., 1983). Table 1 summarizes the results for males and females as well as for freshmen and senior students. Overall, females ( $M = 17.50, SD = 5.62$ ) scored higher than males ( $M = 17.26, SD = 5.18$ ) on environmental exploration indicating a slightly greater use of this career exploration strategy. Results also indicate that seniors

( $M = 18.26, SD = 5.77$ ) scored higher than freshmen ( $M = 16.06, SD = 4.38$ ) on environmental exploration.

Further, results show that females ( $M = 17.02, SD = 3.95$ ) scored slightly higher than males ( $M = 16.73, SD = 3.81$ ) on self exploration, which also indicates a slightly greater use of this career exploration strategy. Similarly, across year in school, seniors' scores ( $M = 17.53, SD = 3.84$ ) were higher than freshmen ( $M = 15.87, SD = 3.67$ ) on self exploration.

Table 1  
Means and Standard Deviations for Environmental and Self Exploration Factors (n = 310)

Environmental Exploration									
Year in School									
Gender	Freshmen			Senior			Total		
	n	M	SD	n	M	SD	n	M	SD
Male	94	16.22	4.46	108	18.17	5.60	202	17.26	5.18
Female	38	15.71	4.22	75	18.40	6.03	113	17.50	5.62
Total	132	16.06	4.38	183	18.26	5.77	315	17.35	5.34

  

Self Exploration									
Year in School									
Gender	Freshmen			Senior			Total		
	n	M	SD	n	M	SD	n	M	SD
Male	94	15.65	3.65	108	17.68	3.70	202	16.73	3.81
Female	38	16.42	3.70	75	17.32	4.05	113	17.02	3.95
Total	132	15.87	3.67	183	17.53	3.84	315	16.83	3.85

Note. Scores for environmental and self-exploration can range from 6 to 30 and 5 to 25, respectively. Higher scores indicate greater use of respective career exploration strategies. Scale: 1 = Little; 2 = Somewhat; 3 = A Moderate Amount; 4 = A Substantial Amount; 5 = A Great Deal.

Table 2 presents bivariate correlations among the career exploration scales, gender, and year in school for the sample. The following scale was used to describe the

strength of the relationships: .01-.09 = negligible; .10-.29 = low; .30-.49 = moderate; .50-.69 = substantial; and .70 or higher = very strong (Davis, 1971).

Relationships between environmental exploration, self exploration, gender, and

year in school ranged from negligible positive to moderate positive.

Table 2  
*Intercorrelations Among Career Exploration Scales, Gender, and Year in School (n = 310)*

Variable	1	2	3	4
1. Gender	--			
2. Year in School	.12	--		
3. EE	.02*	.20*	--	
4. SE	.04*	.21*	.42*	--

Note. EE = Environment Exploration and SE = Self-Exploration  
 \*p < .05.

*Objective 3: Describe the differences in the level of career exploration of students enrolled in a college of agriculture.*

To determine the effect of gender and year in school on the level of career exploration, a factorial multivariate analysis of variance (MANOVA) was performed. The dependent variables were environmental and self exploration, and the independent variables were gender (two levels: male and female) and year in school (two levels: freshmen and seniors). (All eta-squared ( $\eta^2$ ) results that are reported use the partial eta-squared formula (SSeffect/(SSeffect + SSerror)). Tabachnik and Fidell (1989) suggest that partial  $\eta^2$  is an appropriate alternate computation of  $\eta^2$ .

Significant multivariate results were obtained for the main effects of year in school  $F(2, 310) = 8.294, p < .001, \eta^2 = .05$  (Table 3). Nonsignificant main effects were observed for gender  $F(2, 310) = .197, p > .05$  and the year in school x gender interaction  $F(2, 310) = 1.434, p > .05$ . None of the partial  $\eta^2$  values for the MANOVA analyses approached Cohen's criteria for

small effect size ( $d = .20$ ). At the univariate level, significant main effects for year in school were observed for environmental exploration,  $F(1, 311) = 13.093, p < .001, \eta^2 = .04$  and self exploration,  $F(1, 311) = 10.096, p < .05, \eta^2 = .03$  (Table 4). Results further indicated that seniors ( $M = 18.22, SD = 5.79$ ) scored significantly higher than freshmen ( $M = 16.08, SD = 4.38; t = -3.743, p < .001$ ) on environmental exploration indicating greater use of this exploratory behavior. Additionally, seniors ( $M = 17.53, SD=3.84$ ) scored significantly higher than freshmen ( $M = 15.87, SD = 3.67; t = -3.852, p < .001$ ) on self exploration also indicating greater use of this exploratory behavior. Nonsignificant univariate main effects for gender were observed for environmental exploration,  $F(1, 311) = .048, p > .05$  and self exploration,  $F(1, 311) = .204, p > .05$ . Nonsignificant univariate main effects were also observed for the year in school x gender interaction for environmental exploration,  $F(1, 311) = .340, p > .05$  and self exploration,  $F(1, 311) = 1.501, p > .05$ .

Table 3  
 Summary Data of MANOVA Results for Year in School, Gender, and Gender x Year in School Interaction (n = 310)

Variable	df	Wilk's Lambda	F	p	Partial Eta <sup>2</sup>
Year in School	2	.949	8.294	.000*	.051
Gender	2	.999	.197	.822	.001
Year in School x Gender	2	.991	1.434	.240	.009

\*p < .001

Table 4  
 Summary Data of Univariate Results for Year in School, Gender, and Gender x Year in School Interaction (n = 310)

Independent Variable	Dependent Variable	df	MS	F	p	Partial Eta <sup>2</sup>
Year in School	Environmental Exploration	1	360.427	13.093	.000**	.040
	Self Exploration	1	143.771	10.096	.002*	.031
Gender	Environmental Exploration	1	1.312	.048	.827	.000
	Self Exploration	1	2.909	.204	.652	.001
Year in School x Gender	Environmental Exploration	1	9.351	.340	.560	.001
	Self Exploration	1	21.369	1.501	.221	.005

\*p < .05 \*\* p < .001

### Conclusions and Discussion

Due to sampling methods used in this study, results are not generalizable to any larger population. Students in this study represented a variety academic departments in Iowa State University's College of Agriculture and Life Sciences which include agricultural economics; natural resource, ecology, and management; agricultural and biosystems engineering; animal science;

agricultural education; agronomy; entomology; and horticulture.

Level of career exploration was measured using the environmental and self exploration scales of the CES (Stumpf et al., 1983). Environmental exploration concerns an individual's need to gather information to determine where different relevant job opportunities exist, demands of different types of work environments, and the nature of different types of organizational cultures.

Both males and females in this study indicated moderate levels of environmental exploration behaviors. Similar observations were also true for freshmen and senior students.

The extent of career exploratory behaviors of students in this study was also assessed by the self exploration scale of the CES. Self-exploration is an examination of one's personal goals, values, skills, needs, and interests. Specifically, it concerns gathering information about the personal aspects related to making assessments of the person-environment fit of different employment opportunities (Werbel, 2000). Both males and females in this study indicated moderate levels of environmental behaviors. Again, similar observations were also true for freshmen and senior students.

Finally, significant main effects for year in school were observed for environmental and self exploration. For both environmental and self exploration, seniors scored significantly higher than freshmen indicating greater use of these career exploration strategies in the career exploration process.

The findings of this study are consistent with career development theory and research related to career exploration suggesting that, in general, college students are primarily in the career exploration phase of career development. Super's (1957) life stage of exploration (ages 15 to 25), includes three substages: crystallizing, specifying, and implementing. Students in this study were classified as freshmen and seniors which correspond most closely to the crystallizing substage of career development. Crystallizing is the stage in which people clarify what they want to do. They learn about entry-level jobs that may be appropriate for them, and they learn what skills are required by the jobs that interest them (Sharf, 2006).

Overall, students in this study indicated moderate levels of environmental and self exploration behaviors. Specifically, the findings document that students are examining their personal goals, values, skills, needs, and interests in terms of various career opportunities related to the world of work. The findings of this study also support previous research that individuals may vary in their exploratory

activity as a function of person factors (Jordaan, 1963; Stumpf et al., 1983; Taveira, et al., 1998). For example, the noted gender and grade level differences supports Super's (1957; 1963; 1980) self-concept theory that career exploration is a developmental process. In terms of grade level, differences between freshmen and senior students can be attributed to the fact that many freshmen enter college with limited information about career alternatives, which influences their level of career exploratory behavior (Robinson, 1994).

### Recommendations and Implications

Given that students in this study indicated only moderate levels of career exploratory behaviors, a need might exist to emphasize the integration of various career development experiences across academic programs offered in this College of Agriculture and Life Sciences. For example, Jones and Larke (2003) noted that colleges of agriculture should seek to make a greater impact on students' career choice and that faculty should help ensure that students are aware of the numerous job opportunities available and enlighten students on the availability of competitive employment options. Jones and Larke also concluded that the impact on the career choice process could be made through teaching, mentoring, and providing enhanced interaction with leaders already in the career field.

Another recommended career intervention is the use of career courses. Career courses are one of the most common strategies used to provide undergraduate students with the necessary career development experiences needed to make solid career decisions. Career courses also have been identified as an effective means of helping students increase the frequency of career exploratory behaviors (Peterson & Burck, 1982). For example, King and Kotrlik (1995) recommended that a course on career development be added to the core curriculum in Louisiana State University's College of Agriculture to provide undergraduate students with a variety of comprehensive career development experiences. Because a willingness to explore or look for information is a



fundamental concept of career exploration, which subsequently impacts career choice; evidence suggests that career exploration should be a major component of curriculum in colleges of agriculture.

The findings of this study also have implications for the U.S. agricultural industry, which is faced with major challenges concerning the current and future shortage of individuals to work in agriculture-related careers, as well as for colleges of agriculture that prepare students for the agricultural workforce. For example, in a recent study, academic program administrators in colleges of agriculture and natural resources evaluated the factors affecting students' choice to seek admission and matriculate. Students most often cited "Lack of knowledge about employment opportunities," "Lack of knowledge about field of study," and "Perceived relevance/importance to future career" as the major problems and concerns influencing their decision to select the agricultural sciences as a career major (Gilmore et al., 2006). The findings clearly indicate that colleges of agriculture and natural resources continue to be challenged in helping students better understand the broad academic and career opportunities in these fields (Gilmore et al., 2006). Even more, the findings seem to indicate that perhaps students are not obtaining quality career development experiences in order to help them make more informed academic and career choices.

### Recommendations for Future Research

Future research should replicate this study with students across all academic programs within colleges of agriculture. This may help determine if the findings are common among traditional as well as non-traditional agriculture disciplines. Additionally, because research focused on career exploration is lacking, future studies should examine the level of career exploratory behaviors of students enrolled in postsecondary programs of agriculture. Most importantly, because of the limited ethnic diversity of the sample used in this study, future studies should examine the level of

career exploration with students from a more diverse population.

### References

- Afonso, J. M., & Taveira, M. C. (2001). *Career exploration in adolescence: The role of social status and gender*. Center of Studies of Education and Psychology, University of Minho.
- Bartley, D. F., & Robitschek, C. (2000). Career exploration: A multivariate analysis of predictors. *Journal of Vocational Behavior, 56*, 63-81.
- Blustein, D. L. (1988). The relationship between motivational processes and career exploration. *Journal of Vocational Behavior, 32*, 345-357.
- Blustein, D. L. (1989a). The role of career exploration in the career decision-making of college students. *Journal of College Student Development, 30*, 111-117.
- Blustein, D. L. (1989b). The role of goal instability and career self-efficacy in the career exploration process. *Journal of Vocational Behavior, 35*, 194-203.
- Blustein, D. L., & Phillips, S. D. (1988). Individual and contextual factors in career exploration. *Journal of Vocational Behavior, 33*, 203-216.
- Brown, C., Darden, E. E., Shelton, M. L., & Dipoto, M. C. (1999). Career exploration and self-efficacy of high school students: Are there urban/suburban differences? *Journal of Career Assessment, 7*(3), 227-237.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Davis, J. A. (1971). *Elementary survey analysis*. Englewood Cliffs, NJ: Prentice-Hall

Gilmore, J. L., Goecker, A. D., Smith, E., Boetler, F. E., Gonzalez, J. A., Mack, T. P., & Whitaker, A. D. (2006). *Shifts in the production and employment of baccalaureate degree graduates from U.S. colleges of agriculture and natural resources, 1990-2005*. United States Department of Agriculture.

Greenhaus, J. H., Hawkins, B. L., & Brenner, O. C. (1983). The impact of career exploration among undergraduate business students. *Journal of College Student Personnel, 24*, 394-502.

Herr, E. L., Cramer, S. H., & Niles, S. G. (2004). *Career guidance and counseling through the lifespan* (6th ed.). Boston, MA: Pearson Education.

Hitch, J., & Gore, P. A. (2005). Career development in the first-year seminar: Best practice versus actual practice. In P. A. Gore, Jr. (Ed), *Facilitating the career development of students in transition* (Monograph No. 43, pp. 45-60). Columbia: University of South Carolina, National Resource Center for the First-Year Experience and Students in Transition.

Jepsen, D. A. (1984). The developmental perspective on vocational behavior: A review of theory and research. In S. D. Brown & R. W. Lent (Eds.), *Handbook of counseling psychology* (pp. 178-215). New York: John Wiley.

Jones, W. A., & Larke, A. (2003). Factors influencing career choice of ethnic minorities in agriculture. *NACTA Journal, 47*(3), 11-17.

Jordaan, J. P. (1963). Exploratory behavior: The formation of self and occupational concepts. In D. E. Super, R. Starishevsky, N. Matlin, & J. P. Jordaan (Eds), *Career development: Self-concept theory*. New York: College Entrance Examination Board.

Ketterson, T. U., & Blustein, D. L. (1997). Attachment relationships and the career exploration process. *Career Development Quarterly, 46*, 167-178.

King, L. O., & Kotrlik, J. W. (1995). Relevance of the general education core curriculum to career goals of college of agriculture students. *Journal of Agricultural Education, 36*(3), 26-33.

Niles, S.G., & J. Harris-Bowlsbey. (2002). *Career development interventions in the 21<sup>st</sup> century*. Upper Saddle, NJ: Prentice Hall.

Oliver, J. D, & Hinkle, D. E. (1981). *Selecting procedures for agricultural education research*. Paper presented at the 8th Annual National Agricultural Education Research Meeting, Atlanta, GA.

Peterson, G. W, & Burck, H. D. (1982). A competency approach to accountability in human service programs. *Personnel & Guidance Journal, 60*, 492-495.

Phillips, S. D. (1982). Career exploration in adulthood. *Journal of Vocational Behavior, 20*, 129-140.

Phipps, L. J., & Osborne, E. W. (1988) *Handbook on agricultural education in public schools*. Danville, IL: Interstate.

Raskin, P. M. (1985). Identity in vocational development. In A. S. Waterman (Ed.), *Identity in adolescence: Process and concepts* (pp. 25-42). San Francisco, CA: Jossey-Bass.

Robinson, D. A. G. (1994). Career exploration with freshmen engineering students. *Journal of College Student Development, 35*, 68-69.

Sharf, R. S. (2006). *Applying career development theory to counseling*. Pacific Grove, CA: Cole.

Smith, P. L., & Fouad, N. A. (1999). Subject-matter specificity of the self-efficacy, outcome expectancies, interest, and goals: Implications for the social-cognitive model. *Journal of Counseling Psychology, 46*(4), 461-471.

Stumpf, S. A., Austin, E. J., & Hartman, K. (1984). The impact of career exploration and interview readiness on interview performance and outcomes. *Journal of Vocational Behavior, 24*, 222-235.

Stumpf, S. A., & Colarelli, S. M. (1981). *The effects of career education on exploratory behavior and job search outcomes*. Proceedings of the Annual Meeting of the Academy of Management (pp. 76-80).

Stumpf, S. A., Colarelli, S. M., & Hartmann, K. (1983). Development of the Career Exploration Survey (CES). *Journal of Vocational Behavior, 22*, 191-226.

Stumpf, S. A., & Hartman, K. (1984). Individual exploration to organizational commitment or withdrawal. *Academy of Management Journal, 27*, 308-329.

Sugalski, T. D., & Greenhaus, J. H. (1986). Career exploration and goal setting among managerial employees. *Journal of Vocational Behavior, 29*, 102-114.

Super, D. E. (1957). *The psychology of careers*. New York: Harper & Row.

Super, D. E. (1963). Vocational development in adolescence and early adulthood: Tasks and behaviors. In D. E. Super, R. Starishevsky, N. Matlin, & J. P. Jordaan, *Career development: Self-concept theory*. New York: College Entrance Examination Board.

Super, D. E. (1980). A life-span, life-space approach to career development. *Journal of Vocational Behavior, 16*, 282-298.

Tabachnik, B. G., & Fidell, L. S. (1989). *Using multivariate statistics* (2nd ed.). New York: Harper Collins.

Taveira, M. D., & Moreno, M. L. R. (2003). Guidance theory and practice: The status of career exploration. *British Journal of Guidance and Counseling, 31*(2), 189-207.

Taveira, M. D., Silva, M. C., Rodriguez, M. L., & Maia, J. (1998). Individual characteristics and career exploration. *British Journal of Guidance and Counseling, 26*(1), 89-104.

Taylor, M. S. (1985). The role of occupational knowledge and self-concept crystallization in students' school to-work transition. *Journal of Counseling Psychology, 32*, 530-550.

Vondracek, R. W. (1992). The construct of identity and its use in career theory and research. *The Career Development Quarterly, 41*, 130-144.

Werbelt, J. D. (2000). Relationships among career exploration, job search intensity, and job search effectiveness in graduating college students. *Journal of Vocational Behavior, 57*, 379-394.

LEVON T. ESTERS is an Assistant Professor in the Department of Agricultural Education and Studies at Iowa State University, 217A Curtiss Hall, Ames, IA 50010. E-mail: [lte@iastate.edu](mailto:lte@iastate.edu).

RACHEL E. McCULLOH is an Undergraduate Research Assistant in the Department of Agricultural Education and Studies at Iowa State University, 201 Curtiss Hall, Ames, IA 50010. E-mail: [rmac@iastate.edu](mailto:rmac@iastate.edu).