CAREER COUNSELING AND CAREER COURSES:
PROCESS, IMPACT AND OUTCOMES

BY

VETISHA L. MCCLAIR

DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Educational Psychology
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2010

Urbana, Illinois

Doctoral Committee:

Professor James Rounds, Chair
Professor Lizanne DeStefano
Professor James Hannum
Gail Rooney, PhD

Abstract

The current study seeks to build on to the existing literature on career interventions by empirically examining possible outcomes of two of the most widely utilized career interventions, career counseling and career courses. This investigation used Critical Ingredients (Brown & Ryan Krane, 2000; Brown, et al., 2003; Ryan, 1999) to assess the components of career counseling and career courses and the relationship between number of critical ingredients and student outcomes. Critical Ingredients were also used in a separate pilot study where career counselors and students were asked to report the number of critical ingredients present in a career counseling session. Student course participants ($N = 139$) and counseling participants ($N = 130$), enrolled at a large Midwestern university were assessed at three timepoints during the Fall 2008 semester: the first 4 weeks, midterm and finals. Each participant was either enrolled in a career course or received career counseling during that semester. Hierarchical Linear Modeling (HLM) was used to analyze the relationships between outcome variables, demographics and critical ingredients. Analyses found no significant group differences between counseling and course participants on outcome variables, but there were group differences in number of critical ingredients experienced. An HLM model was established where Career Decision Making Self-Efficacy (CDMSE; Betz & Taylor, 1994) scores (intercept) were predicted by race, year in school, time and number of critical ingredients experienced. The degree of change (slope) was predicted by individual error variance and number of critical ingredients experienced. This study provides interesting information about the dynamics of the change process as students experience career interventions. Limitations and implications for research and practice were also discussed.

Acknowledgments

      I would like to send a big thanks to everyone who helped me along this long journey. It does take a village to raise a PhD student; these are just a few people who were in mine. Firstly, I need to thank my family members, who have always been supportive, even when they (and/or I) didn't know when I was going to finish. My cohort members (Alexis, Jennifer, Michelle, and Nallely) began this journey with me and were always shoulders to cry on and ears to listen. I need to give many thanks to my advisor, Jim Rounds, who took me in out of the cold and put up with all of my craziness. My committee members, who provided great suggestions and feedback, I really do appreciate your support. This research was supported by the Robert P. Larsen Grant for Research in Career Development from the University of Illinois Career Center. Therefore, I would also like to specially acknowledge Gail Rooney, Margaret Schrock and everyone at The Career Center, without their support this project would not have been possible.

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Chapter 1

Introduction

The process of choosing a major, career or pursuit of a graduate degree is a fundamentally stressful and important decision for many college students (Russell & Petrie, 1992). Some students who experience difficulty finding a suitable career direction ultimately drop out of college (Folsom, Peterson, Reardon, & Mann, 2005). Universities across the country have noticed this trend and developed career-oriented programming/services to address these needs. Universities and colleges have looked towards career services as a way of improving both satisfaction with and utility of a student's educational experience.

The career decision-making process highlights the ways in which individuals choose a career trajectory; moving from a state of confusion to decision (Mau, Calvert, & Gregory, 1997). Various theorists have hypothesized about the exact mechanism by which the process takes place (for a thorough account of recent career decision/development theory, see Betz, 2008). As students navigate the decision-making process, it is important that they have certain information, including knowledge about themselves, the world of work, barriers that may exist, career paths and requirements of occupations (Ryan, 1999). Career professionals and researchers have various techniques and interventions specifically targeted to assist students in obtaining this information.

The current study seeks to build on to the existing literature on career interventions by empirically examining possible outcomes of these interventions. This project is interested in comparing the outcomes associated with two of the most widely utilized interventions, career counseling and career courses. Previous outcome research that compared these interventions has produced inconsistent results. Thus, there is a need to further our understanding of the benefits

of these interventions by empirically evaluating their outcomes. This chapter provides an introduction to career interventions, and highlights evidence of previously explored outcomes of counseling and courses. Next, I discuss the importance of research to learn more about the elements of these interventions. Lastly, I provide justification for further exploration of career counseling and career course outcomes.

Career Interventions

A career intervention is defined as any treatment or endeavor that has the intent of enhancing an individual's career development or impact career decision making (Oliver & Spokane, 1988). This broad definition refers to a number of different actions, including career counseling, taking an interest inventory, self-directed career activities, and courses devoted to major exploration. Previous meta-analytic studies have found that career interventions (broadly defined) have an effect on student outcomes (Oliver & Spokane, 1988; Whiston, Sexton & Lasoff, 1998). However, given the variety of career interventions available, it is important to compare the efficacy of a variety or interventions.

The field of career development and vocational psychology has benefited from a great deal of scholarship and development in recent years. In addition, advances in technology, especially personal computers, have facilitated the development of more sophisticated career intervention technology. A new wave of technological, career intervention advances has occurred in the area of online career counseling and assessment. Vocational assessments which at one time were quite expensive and complex to score can now be completed in seconds. Many developers believed that this technology would ultimately make career counselors obsolete. However, in this case, more advanced techniques does not always mean better. Previous research has found that counselor-assisted interventions produced better outcomes than

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unassisted interventions (Whiston, Brecheisen, & Stephens, 2003). It seems that personal

attention and feedback is important to producing positive career intervention outcomes.

Advances in the field have allowed for counselors to become more multi-faceted and

provide a variety of services. Therefore, counselor assisted interventions is not a homogeneous

category. There are different types of counselor assisted interventions developed to address

different presenting concerns, ages, and ability levels. These interventions may also vary in

number of clients, duration and counselor training.

Two of the most widely utilized and most successful counselor-assisted interventions in

colleges and universities are career counseling and career courses (Whiston, 2002). Career

counseling has been present in the exigent literature since the early 1900s (Whiston & Oliver,

2005). Similarly, universities began offering career courses as early as the 1920s (Folsom &

Reardon, 2003). Over time, these interventions have become so popular that they are now found

(in some form) on the majority of college campuses across the country.

Career counseling is the pursuit of any therapeutic intervention whose scope is to affect

the career decision making process based on elements/theories of traditional counseling. These

types of interactions, between a counselor and an identified client, have been noted in the exigent

literature to have positive outcomes (Oliver & Spokane, 1988; Whiston, et. al., 1998). However,

there have been few studies that have sought to understand how this process works. Currently,

career counseling is more loosely tied to career development theory (Whiston, 2002). There are

many different models and theories of career development available. However, unlike

psychotherapists, many career counselors do not ascribe to just one theoretical orientation.

Instead they attempt to incorporate a number of different theories into their practice. While this

may be useful in the sense that they can tailor interventions to clients, it makes the tracking of outcomes more difficult.

Career courses are courses, usually taken in college (sometimes for credit), that are aimed at facilitating problem-solving, decision-making and career planning skills (Reardon, Leierer, & Lee, 2007).   These courses have been found to be effective in producing a number of positive outcomes (Oliver & Spokane, 1988; Spokane & Oliver, 1983). However, despite these findings, previous researchers have been inconsistent in their appraisal of the utility of these courses. Some argue that while participants receive some rewards as a result of participation in career courses, the rewards to do not justify the cost the universities and colleges incur running these courses (Oliver & Spokane, 1998; Whiston, et. al., 1998).

Career counseling and course interventions, although similar, have some distinctions from each other. The different modalities can have an effect on the expected results. Previous studies have found that larger effect sizes were produced with individuals who participated in individual counseling than individuals who completed a career course (Whiston, et. al., 1998). These results show that for certain outcome variables, career counseling produces greater results. However, the current investigation seeks to further this knowledge by empirically exploring the interaction of outcomes and intervention.

Outcome Research

Career interventions, by definition, have the intent of enhancing an individual's career development or impacting career decision-making (Oliver & Spokane, 1988). Heppner and Heppner (2003) defined career intervention outcomes as changes that occur directly or indirectly as a result of the career intervention. These changes are measured according to their immediate effects (i.e. the client response in the moment), intermediate effects (i.e. change that results from

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one career counseling session/activity), and distal effects (i.e. change that results from the entire intervention) (Heppner & Heppner, 2003). Conversely, process variables can be defined as anything that happens within the career counseling session or during a course.

The general consensus among career professionals and researchers is that career interventions work. However, the extent to which and mechanism by which these interventions work is an area of emerging research. While there are still many areas where further research is warranted, researchers have begun to take a closer look at the elements and effectiveness of some commonly found career interventions. This section provides a review of recent and emerging research in career intervention outcomes, devoting close attention to those outcomes utilized in this study (for a more comprehensive meta-analytic view of outcome research from 1975 to 2000 see Whiston, et. al., 2003).

Previous meta-analysis studies have identified four categories of career intervention outcomes: counseling/psychological, role functioning, career decision making and miscellaneous (Oliver & Spokane, 1988; Spokane & Oliver, 1983; Whiston, et. al., 1998). As this study is interested in assessing intervention outcomes across various domains, these categories provided a basis upon which to select outcome measures that assessed each area. For the purposes of this paper the miscellaneous category was dropped to due to lack of specificity.

Counseling/Psychological. In the original meta-analyses few studies assessed counseling variables. However, over time the number of studies interested in counseling variables has increased. This change is potentially due to the recent push towards incorporation of more psychological variables in the assessment of career intervention outcomes. Career counseling was found to produce positive gains in satisfaction and psychological distress. Clients who underwent career counseling reported that they were overall satisfied with the

process (Healy, 2001; Mau & Fernandes, 2001; Rochlen, et. al, 2004; Rochlen, et. al 1999). Individuals were also found to exhibit decreased psychological distress after career counseling (Multon, et. al., 2001; Rochlen, et. al, 2004). These findings reflect the long-standing debate that career interventions and psychotherapy interventions are more similar than they are different. However, just as these studies answer some crucial questions about the effectiveness of career counseling, they also leave some other questions unanswered.

Previous research has examined the connection between psychological distress and career indecision (Brown & Rector, 2008). However, psychological distress is too global to provide specific information about the cognitive aspects of distress about career choice. By examining psychological outcomes these studies do address some of the possible barriers to effective career decision making. However, few outcome measures have been developed to assess the unique intersection between career and psychological functioning. One of the most promising avenues into addressing the role psychological distress can play in career decision making is Cognitive Information Processing (CIP) Theory.

CIP postulates that effective career decision making can only occur when dysfunctional cognitions are also addressed (Sampson, Peterson, Lenz, Reardon & Saunders, 1999). This theory is based in a cognitive theory of psychotherapy and attempts to incorporate both career needs with possible psychological barriers. The CIP theory states that dysfunctional career thoughts can disturb career decision making (Sampson, et al., 1999). Recently, measures have been developed to assess these dysfunctional career thoughts and these measures have been shown to be associated with positive career intervention outcomes (Sampson, et al., 1999). Research has found that as clients undergo career interventions their negative cognitions in reference to career decisions lessen (Sampson, Peterson, Lenz, Reardon & Saunders, 1996).

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However, few studies have been conducted that examine this outcome in conjunction with other potentially related outcomes. This study seeks to close that gap by examining the connection between counseling/psychological outcomes (negative career thoughts and satisfaction) with other potentially relevant career intervention outcomes. One might assume that as a consequence of reducing negative thoughts other positive changes may occur in the cognitions of a client. If negative cognitions decrease, then clients may also begin to feel higher self-efficacy and perform better in school.

Role Functioning. Since the goal of career interventions is to help students persist in college, career counselors and researchers believe that there are school-related benefits students receive from career interventions. A number of studies have concentrated on constructs that are pertinent to the lives of college students, such as, persistence to graduation (Folsom, et. al., 2005; Smith-Keller, 2005), time to graduation (Folsom, et. al., 2005; Smith-Keller, 2005), grades (Folsom, et. al., 2005; Reardon, et. al., 2007) and course withdrawals (Folsom, et. al., 2005; Smith-Keller, 2005). With few exceptions, this research has focused on career courses.

While these studies are interesting and suggest some of the long-term effects of career interventions on student's lives, there is a need for research in this area to understand more about how intervention characteristics can affect role-functioning outcomes that students experience. Two similar studies (Folsom, et. al., 2005; Smith-Keller, 2005), each assessing role-functioning outcomes highlight this need. When examining a three–credit career course, Folsom and colleagues (2005) found no statistically significant differences between participation and persistence to graduate, time to graduation, and GPA. This study reported that it did find significant differences between participation and number of course withdrawals, where students who completed a career course were less likely to withdraw from subsequent courses in the

middle of the semester (Folsom, et.al., 2005). However, when examining a one-credit career course Smith-Keller (2005) found completely opposite results. This study found career course participants were more likely to persist until graduation, take more time to graduate and graduate with significantly less credits (Smith-Keller, 2005). However, Smith-Keller did not find any significant differences in number of course withdrawals between career course participants and non-participants. Neither study found any significant differences in GPA when comparing career course participants to non-participants. It is unclear what could have caused these differences in results. One potential explanation for these inconsistencies is that one study examined a three-credit course, while the other examined a one-credit course. The differences in the experience and material covered could play a role in the outcomes participants experienced. Role-functioning outcomes have definite value in the assessment of career intervention outcomes. Therefore this study is not only interested in student's experience of role functioning outcomes, it is also interested in the effect various intervention elements have on this outcome.

  Career decision making. In a recent review of the published literature on career courses from 1976-2005, Folsom, Reardon, and Lee (2005) found 52 published documents that outlined the design, history and outcomes of career courses. Over all the studies, Folsom and colleagues reported positive changes in career thoughts, career decision making skills, career decidedness, vocational identity, and job/major satisfaction. Their paper demonstrates both the effectiveness of career courses but also the plethora of research that has been conducted in the area of career decision making outcomes.

  While previous studies were able to look at singular interventions, it was not until the application of meta-analysis that these interventions could be examined in conjunction. Meta-analytic research brought the ability to examine multiple studies simultaneously with increased

sample size. The first meta-analysis of career intervention outcomes was published in 1983 by Spokane and Oliver. This analysis provided the basis for other researchers to examine this topic using this methodology (Brown & Ryan Krane, 2000; Oliver & Spokane, 1988; Whiston, Brecheisen, et. al., 2003; Whiston, Sexton, et. al., 1998).

These meta-analytic studies examined the effect size of career interventions in comparison with other interventions (Brown & Ryan Krane, 2000; Oliver & Spokane, 1988; Whiston, Brecheisen, et. al., 2003; Whiston, Sexton, et. al., 1998). These studies provided useful information for the current study because interventions were compared together and outcomes were assessed as a function of treatment condition. However, there has been a great deal of difference between different studies utilizing the same methods. It was initially determined by Spokane and Oliver (1983) that career courses was the most effective career intervention. In their follow up study, Oliver and Spokane (1988) replicated the findings of their previous meta-analysis and found career courses to produce the highest effect sizes, however, they factored in the cost (time and money) of career courses, and determined that career counseling was the most efficient. In a later replication, Whiston and colleagues (1998) found career counseling to be most effective, followed by computer assessments, then career courses. These meta-analytic studies provide a basis for the current study, because they serve as a basis for the assumptions and design of the current investigation. Particularly, the findings of these meta-analytic studies were used as a basis for hypotheses about the nature of the relationship between decision making outcomes and treatment condition.

Although meta-analysis is a useful tool to compare outcomes, it does come with some drawbacks that make comparison somewhat complicated. First, since the goal of meta-analysis is to combine different studies into larger data sets, this also means combining outcomes. The

career decision making outcomes are placed into larger categories, which could contain a number of different measures. In this case it is impossible to parcel differences between measures. It could be the case that career courses are producing different results on one measure within the same group, whereas career counseling is producing higher scores on another. In essence these would cancel each other out. Also, in-depth analysis is impossible with this technique. It does not provide the reader with an advanced knowledge of the elements of the intervention. This study seeks to further scholarship in the area of decision making outcomes by designing a study to empirically address some of the concerns presented above.

Another drawback to meta-analyses is that the potential findings of any meta-analysis are limited to only the information reported/collected by the previous researchers. In the case of career intervention outcome literature, there are number of other potentially relevant factors that have been continually left out. Particularly, the role of person-specific factors (e.g. race, gender, age, SES) has on intervention outcomes. Currently the assessment of race, particularly, in the career intervention outcome literature has been woefully lacking (Brown & McPartland, 2005). While this is not an explicit aim of this study, demographic information will be collected as a potential way of contextualizing the experience of participants while in the career intervention.

Previous research has provided some insights into the effectiveness of career interventions. However, these studies have also created more questions, than solutions. Due to the broad definitions of constructs, the conclusions about the effect of career interventions have been inconsistent (Whiston, Brecheisen, & Stephens, 2003). While some researchers have remarked that the most effective interventions are career counseling and career courses, there has been no empirical examination of these interventions in concert with each other. In addition, there has been no research that has empirically compared the outcomes of these interventions and

assessed how other demographic factors may contribute to outcome differences. This study

seeks to explore the similarities and the differences between these interventions, with the hope

that the information presented here will help definitively if the treatments works. In addition, it

will provide some information about the influence of other factors on treatment outcome. My

approach to assessing the ways in which these interventions are similar is to assess the different

elements that comprise these interventions.

Critical Ingredients

Traditionally, psychotherapy research has focused on both the process in which therapy

operates and outcome of interventions. However, as a whole, career intervention research has

mainly focused on outcomes. In previous literature, most career counseling interventions have

been lumped into one category, with little attention to differences in approach. The amount of

knowledge that we have about the process of an intervention differs by type. Within career

interventions, there seems to be much more information about the process of career courses, than

about career counseling. It is important to learn more about what happens within the

intervention, because it is possible that differences in process elements could contribute to

previously established differences in outcomes. An emerging vein of research has sought to

provide a better link between career intervention process and outcomes. This area of research

concentrates on examining the elements in career counseling interventions that have been found

to promote client change.

The first work in the critical ingredients area occurred with the work of Nancy Ryan

(1999) on her doctoral dissertation, a meta-analysis of studies examining career choice outcomes.

This study re-examined literature previously reviewed by Oliver and Spokane (1988) and

Whiston, Sexton & Lasoff (1998), using up-to-date meta-analytic techniques. Unlike previous

meta-analytic examinations of career intervention outcomes, Ryan also coded for the presence of 19 intervention components (e.g. written exercises, card sorts, and computer interventions). This study supported previous research about the outcomes and found comparable, although slightly lower, effect sizes across intervention. In addition, it provided information about the elements and process of career interventions that had previously been absent from this literature set.

Ryan (1999) discovered a non-linear relationship existed between intervention effect size and number of sessions. There were major leaps in effectiveness between sessions 1 and 5, but a decline in effectiveness for longer interventions. Ryan (1999) found that interventions with more than 12 sessions produced effect sizes that were similar to one or two session interventions. This study also identified the different elements of an intervention that produced the greatest outcomes. Five intervention components, (a) workbooks/written exercises, (b) counselor dialogue/ individualized feedback, (c) information concerning the world of work, (d) modeling, and (e) increased environmental support, were found to have the greatest influence on participant outcomes.

Ryan (1999) defined each of these five components as follows: Workbooks are a "vocational intervention which involves the use of workbooks (i.e., books that prescribe activities for the client or encourage the client to fill in by hand relevant reflections/thoughts/feelings concerning their vocational development). This intervention may also include vocational journals or vocational diaries" (p. 115). Counselor dialogue is a "vocational intervention that involves one-on-one counselor-client dialogue concerning vocational issues or vocational development. This is most likely to be individual counseling and can include individualized test interpretation" (p. 116). Provision of information concerning the world of work is a "vocational intervention which involves the counselor (or a computer)

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providing the client with practical information concerning the work environment" (p. 117).

Increased environmental supports is "a discussion of the role of the familial/sociocultural

environment in career development <u>and</u> which provides input concerning ways in which to

increase the support that important other give to the client" (p. 117).

This study showed the individual effects of these components, and also the combined

effects. When these five elements were combined in an intervention, the overall effectiveness of

the intervention also increased. Ryan (1999) proposed that a way to improve the effectiveness of

career interventions is to include more (if not all) of these five intervention components.

The work of Ryan (1999) has been used as basis to explore the components of career

interventions and which are most likely to produce the greatest outcomes (Brown & Ryan Krane,

2000; Brown, Ryan Krane, Brecheisen, et. al., 2003). The components identified in Ryan (1999)

have been extended to include more elements (Brown, et. al., 2003). This list of career

intervention elements now includes 19 common ingredients to an effective career intervention,

with the first five elements, identified in Ryan (1999), called critical ingredients (Brown, et. al.,

2003). Furthermore, it was found that interventions with more of the critical ingredients

produced larger effect sizes than those with less (Brown & Ryan Krane, 2000). Thus,

interventions that included none of the five critical ingredients (i.e. interventions that

incorporated combinations of the other 14 ingredients) produced an average effect size of .22

(Brown & Ryan Krane, 2000). Whereas those with one, two or three of the first five critical

ingredients yielded average effect sizes of .45, .61, and .99, respectively (Brown & Ryan Krane,

2000). It was found that these effects were unrelated to number of sessions (Brown, et. al.,

2003). In addition, the first five items (critical ingredients) were found to be unique, since no

combination of the remaining 14 items was able to produce a clear or linear relationship with effect size (Brown, et. al., 2003).

Since the incorporation of critical ingredients has had an effect on outcomes, it is important not only to assess the outcome of the intervention, but also the elements of these critical ingredients in each intervention. Until now, the effect that intervention elements, measured by number of critical ingredients present, on outcome variables has not been widely researched. The scholarship examining critical ingredients is relevant to the current study because it assists in learning more about the process of career interventions. It provides critical information about the process of career counseling, specifically, that seems to be absent in previous research. Both theoretical and process-oriented research has pointed out that career courses and counseling are likely to incorporate other interventions, including interest inventories and computer-based activities. The identification of critical ingredients assesses the elements of other interventions counselors present during career counseling or courses. In previous studies that incorporated critical ingredients, these elements were coded by researchers retroactively. In the present study, I examine the critical ingredients, utilizing self-report data, as students are engaged in career counseling or a career course.

Rationale and Purpose

Career professionals and researchers have for many years touted the effectiveness and merits of career interventions. However, for a long time, practitioners had nothing but anecdotal evidence to prove their claims. Over the last twenty years more advances in intervention techniques and statistical analyses has made the study of career intervention outcomes more important. As a whole, the body of research has found that the most researched and most effective career interventions are: career counseling and career courses.

The outcomes of career interventions have been found to be related to three distinct areas, counseling/psychological, role-functioning and career decision making. Research that includes counseling/psychological elements has not been very prevalent in the research literature. However, the research that has been conducted highlights the importance of understanding more about the psychological process that may present barriers for career intervention participants. These results also highlight that in order to get an accurate view of the outcomes of career interventions, the outcome variables must be based in a career context. Psychological outcomes on their own are not precise enough to predict the career-related psychological gains participants may experience, such as career thoughts and self-efficacy. Secondly, the information provided on role-functioning outcomes reiterates the importance of finding out more information about the elements of a career intervention. The research literature in this area is inconsistent. At this point it may be a better idea to study the elements of each intervention in the short-term, before long-term role-functioning outcomes can be explored. There have been a number of studies that have looked at the effectiveness of career counseling and career courses individually, but few have empirically examined these interventions together. Previous research has found that these two interventions are among the most effective interventions directed at careers for college students (Oliver & Spokane, 1988, Whiston, Sexton & Lasoff, 1998). However, the results have been inconsistent. The true impact of these interventions cannot be understood until both the process of the intervention and the outcomes that individuals receive are studied in conjunction.

The present study addresses some of the issues present in the current exigent literature on interventions. It provides a more comprehensive understanding of the provision of career counseling and career courses. While previous research has found that these interventions produce some effect on those who utilize these services, there is little information about the type

of effects.   The purpose of this study is to address some of the gaps in the empirical literature by (a) assessing the level of critical ingredients present in each approach and (b) comparing the level of career related outcomes experienced by students who participate in each of these interventions.

Information gained in this study can be used in many ways. One potential use of this research may be to help career counselors and career course instructors to identify areas of improvement in their service of students with career issues. In addition, the information provided by this study could make an impact on the campus environment by providing empirical evidence of the utility and quality of career services on the university campus.

Research questions and hypotheses. This dissertation research project addresses some of the issues present in the current exigent literature on career interventions. It will provide a more comprehensive understanding the provision of career counseling and career courses. This study seeks to advance previous research by increasing our understanding of the career intervention elements that are present in career counseling and career courses and identifying potential outcomes of these interventions.

The present study is guided by three research questions: (a) What are the outcomes of various career related interventions (i.e. career counseling and taking a career exploration course)? (b) How do these outcomes differ by type of career intervention? and (c) Which *critical ingredients* are present in these interventions? And how do critical ingredients affect outcomes?

Hypothesis 1 and 2. It is expected that outcomes will differ by intervention. Similar to Spokane and Oliver (1983), Oliver and Spokane (1988), Whiston, et al. (2003) and Whiston, et al. (1998) intervention outcomes will differ by intervention modality. In addition, it is expected that career courses will produce the highest number and magnitude of outcomes. This

hypothesis stems from previous research that found career courses to be the most effective (Oliver & Spokane, 1988; Spokane & Oliver, 1983).

Hypothesis 3. It is expected that Ryan's critical ingredients will have an effect on the findings of this study. Similar to previous studies on critical ingredients, the intervention with the most number of critical ingredients, on average, will also produce the greatest number of outcomes. Ryan (1999) and Brown and colleagues (2003) reported that differences in outcomes by number of critical ingredients occurred regardless of treatment duration and modality. It is expected that these findings will be replicated in the current study.

Chapter 2

Method

Participants

This study included a total of 269 students enrolled at a large Midwestern university. At the beginning of the Fall 2008 semester students enrolled in career courses and who had completed career counseling were recruited. Each participant was enrolled in the university and at least 18 years old by Time 3. Participant ages ranged from 18 years to 23 years or older. There were 78 males (29.0%), 190 females (70.6%) and 1 participant (0.4%) who did not report sex. The racial make-up of the sample included people who identified as: Asian/Pacific Islander (n = 36, 13.4%), Black/African American (n = 39, 14.5%), Latino/Hispanic (n = 13, 4.8%), White/Caucasian (n = 168, 62.5%), and Multiracial (n = 12, 4.5%). The number of students in each treatment condition were similar, Counseling (n = 130) and Courses (n = 139). Table 1 displays participant demographic variable by treatment condition.

Table 1

Demographic Data By Treatment Condition

	Courses	Counseling	Total
Gender			
Male	42	36	78
Female	96	94	190
Race			
Asian	8	28	36
Black	27	12	39
Latino	7	6	13
White	91	77	168
Multiracial	5	7	12

(continued)

Table 1 (continued)

	Courses	Counseling	Total
Year in school			
Freshman	24	23	47
Sophomore	61	30	91
Junior	18	23	41
Senior	35	51	86
Graduate/professional	0	3	3
Time 1			
Complete	134	130	264
Missing	5	0	5
Time 2			
Complete	107	21	128
Missing	32	109	141
Time 3			
Complete	76	19	95
Missing	63	111	174

The first time point yielded 264 participants. The second and third time points produced 128 and 95 participants, respectively. Thus, the overall rate of attrition for this study was 64.0%. Studies with similar research designs (longitudinal studies that included online surveys) demonstrated similar rates of attrition. All students who participated in the project were entered into drawings for $50 gift cards.

Career course participants. There were 139 students in the career course treatment condition. Each career course participant was enrolled in a university sponsored career exploration course. Students were recruited from 9 of the 10 available sections of the course. Each section of the course contained 20-30 students. One section of the course had an abbreviated schedule (8 weeks) and was ineligible for inclusion. Career course participants

received course research credit in addition to drawing entry for participation. Time 1 data collection included 134 career course students. Times 2 and Time 3 included 107 and 76 participants, respectively. In addition, it should be noted that 5 career course participants completed the time three data collection, but there is no evidence that they completed the prior two data collections.

Career counseling participants. This study included 130 students in the career counseling condition. These participants completed at least one general career counseling session at the university career center. Response rates for Time 2 and Time 3 data collections were considerably low (16.1% and 14.6%, respectively). Counseling participants received no additional incentive outside of a entry into the $50 gift-card drawing.

Pilot study. To assess the level of agreement between counselor and student ratings a pilot study was conducted at a career center at a large Midwestern university. This study consisted of collecting both counselor and student ratings of session content. Initially, 52 surveys were returned. Two counselor surveys were dropped due to being unpaired with a student survey. One pair of counselor and student pairings was also dropped due to missing items. The final sample included 24 pairs of surveys. No demographic data was collected on pilot study participants

Measures

Demographic questionnaire. The demographic questionnaire garnered demographic information including participants' age, sex, self-identified race, ethnicity, and year in school. In addition, item measured potential motivation for seeking services, satisfaction with services received, and if participant took the Strong Interest Inventory (Strong, Donnay, Morris, Schaubhut, & Thompson, 2004). Participants were also asked to provide up to eight careers that

they have considered or day-dreamed about. In Time 3 additional outcome questions were added. These questions assessed role functioning outcomes, both decision and action-based. Decision outcomes included deciding to change major, deciding to go to graduate/professional school and deciding on a career direction. Action-based outcomes were changing major, meeting with a career counselor, applying for a job or internship, and applying for graduate or professional school.

Career Thoughts Inventory (CTI; Sampson, Peterson, Lenz, Reardon, & Saunders, 1996). The Career Thoughts Inventory (CTI) was given at Time 3 to assess problem solving and decision making. The CTI is based on the cognitive information processing (CIP) theoretical approach to career development and career services (Peterson, Sampson, & Reardon, 1991). This 48 item self-report measure used a 4-point rating scale ranging from 0 *(strongly disagree)* to 3 *(strongly agree).* It consists of three subscales. The Decision Making Confusion subscale (14 items) measures the extent to which emotions or a lack of decision-making skill impedes one's ability to make a career decision. The Commitment Anxiety subscale (10 items) measures the impact anxiety has on a person's ability to commit to a career decision. The External Conflict subscale (5 items) examines how well a person uses input from outside sources in decision making.

Previous research has found alpha coefficients for the total score CTI ranging from .93 to .97 (Sampson, et al., 1999), with subscale ranges between .74 to .94 (Sampson et. al., 1999). In this investigation the total scale coefficient alpha was .96. The subscale alphas were, Decision Making Confusion subscale ($\alpha = .97$), Commitment Anxiety subscale ($\alpha = .90$), and External Conflict subscale ($\alpha = .89$).

Career Decision Making Self-Efficacy Scale (CDMSE-SF; Betz & Taylor, 1994). The Career Decision Making Self-Efficacy scale was used to measure the participants' beliefs in their ability to successfully make career decisions. The 25-item self-report measure uses a five-point item response format ranging from 1 (*no confidence at all*) through 5 (*strongly complete confidence*). Higher scores reflect experiencing higher levels of career decision making self efficacy. This measure was developed to assess a five factor model. Each factor consists of five survey items. These factors involve the participant's feelings of competency in their abilities to (a) Self-appraise (b) gather occupational information, (c) select career goals, (d) engage in career planning, and (e) problem solve when difficulties are encountered. The Career Decision Making Self-Efficacy—Short-form has been found to correlate with other similar measures. Betz and colleagues (1996) provided convergent validity evidence of the CDMSE--SF with a number of theoretically related measures including My Vocational Situation (MVS; Holland, Johnston, & Asama, 1993) and The Career Decision Scale (CDS; Osipow, 1987).

Previous research has found sufficient coefficient alpha estimates, including .73 (self-appraisal), .75 (problem solving), .78 (occupational information), .81 (planning) and .83 (goal selection), with a total scale estimate of .94 (Betz, Klein, & Taylor, 1996). The internal consistency estimates of the short form are comparable to the long- form and are within the acceptable range for research purposes. This scale was given at time points 1 and 3. Time 1 alpha coefficient estimates were: .82 (self-appraisal), .79 (problem solving), .77 (occupational information), .80 (planning) and .87 (goal selection), with a total scale estimate of .94. Time 3 alpha coefficient estimates were: .87 (self-appraisal), .86 (problem solving), .82 (occupational information), .84 (planning) and .89 (goal selection), with a total scale estimate of .96.

Career Decision Making Scale (CDS; Osipow, Carney, & Barak, 1976; Osipow, 1987). The Career Decision Making Scale was given to measure the level of decidedness or indecision participants had about their career choice. This 19-item self-report measure used a 4-point scale ranging from 3 (*exactly like me*) to 0 (*not at all like me*). The scale consists of the two subscales, the Certainty scale (2 items) and the Indecision scale (16 items). The Certainty scale assessed participant's decidedness about their career and academic major choices. The Indecision scale measured reasons for career indecision. These two subscales are negatively correlated. The final item of the scale is an open-ended item that provides space for individuals who feel that their situation is not being reflected in the survey items. This item was not utilized in this study.

In previous research, Coefficient alpha estimates have been in the acceptable range for research purposes (Osipow, 1987). In a study using a population of college-aged adults the alpha estimate was .79 (Schmidt & Nilsson, 2006). This scale was given at Time 3. Coefficient alpha estimate for the total scale was .89, with scale scores of .92 (Indecision) and .81 (Certainty).

Critical Ingredients Scale. The Critical Ingredients Scale is an 18 item scale developed for the current study. This scale assessed the career intervention ingredients proposed by Ryan (1999). These ingredients included both critical ingredients, such as written exercises, individualized feedback, information about the world of work, exposure to vocational models, and emphasis on building external support for career decisions and ingredients that were found to not have an effect on outcomes, such as computer-guided assistance, outside reading and anxiety reduction. Ryan's (1999) study had 19 items, including an "other" category. This 19th item was not included in the present scale. This self-report measure asked participants if they thought their treatment condition has addressed each component. This measure uses a dichotomous (*yes,*

no) response format. Higher scores indicated more critical ingredients were addressed in the participant's treatment condition. This scale was given at Time 1, Time 2 and Time 3. Table 2 shows the means and standard deviations for the critical items scores across all three timepoints.

Table 2

Percentages of Critical Ingredients Scale Items Endorsed By Condition

	Courses			Counseling		
Critical Item	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
Workbooks and written exercises	66%	63%	63%	30%	35%	37%
Individualized interpretations and feedback	86%	82%	84%	59%	50%	84%
World of work information	80%	94%	96%	68%	60%	89%
Modeling	90%	93%	95%	44%	25%	68%
Attention to building support	66%	79%	88%	59%	45%	63%
Computer-guided assistance	94%	95%	92%	42%	35%	53%
Self-report inventories	98%	99%	96%	38%	35%	47%
Counselor support	74%	74%	78%	86%	85%	83%
Cognitive restructuring	63%	75%	84%	44%	45%	84%
Vocational exploration	92%	93%	92%	81%	75%	89%
Values clarification	76%	85%	86%	74%	75%	74%
Card sort procedures	12%	21%	37%	12%	0%	11%
Decision-making models and strategies	92%	95%	93%	29%	10%	37%
Outside reading	82%	79%	80%	27%	10%	32%
Personal performance accomplishments	52%	72%	78%	12%	0%	21%
Anxiety reduction	43%	59%	78%	16%	5%	26%
Vicarious achievements	64%	76%	91%	22%	25%	32%
Attention to decreasing barriers	70%	83%	96%	43%	40%	63%

Procedure

      Primary investigation. Prior to beginning this study, campus officials (i.e. the director of

the career services office and faculty liaison for career course) were contacted for permission to

collect data. In addition, IRB approval was obtained. All scales for this survey were adapted for

a web-based administration and dispensed through a commercial survey facilitation web-site

(i.e., Survey Monkey). Data for this project was collected at three-time points within one

academic semester. After each data collection, each participant (who elected to enter the drawing

by providing their email address) was entered into a random drawing to receive two $50 gift

certificates to the campus bookstore. Table 3 indicates the name of each variable and the

timepoint in which it was given.

Table 3

Measures by Timepoint

Timepoint	Demographic	CTI	CDMSE	CDS	Critical Ingredients
1	Y	N	Y	N	Y
2	Y	N	N	N	Y
3	Y	Y	Y	Y	Y

Note. Y= yes*; N =* no.

      Participants in the career course treatment condition were enrolled in a section of a career

development course. This course featured consistent content taught by different graduate

instructors each section. Students who participated in the abbreviated version of this course were

not solicited for participation. The principal investigator visited each section to explain the study

and obtain the email addresses of the students who were interested in participating in the study.

In addition, course instructors were given advertisements should students desire to participate at

a later date. Participants solicited through the career exploration course also received course research participation credit. These students were contacted at three times over the course of the 16 week Fall semester, specifically at weeks 4, 10 and 16.

Participants in the career counseling treatment condition were undergraduates at the university and completed at least one 50 minute appointment with a career advisor. Individuals who participate in career counseling at the institution studied usually engage in 1.8 to 2.2 sessions on average with a career counselor (G. Rooney, personal communication, June 21, 2010). To obtain an appropriate number of participants in this condition, data was collected in two waves (each with 3 time points). The initial wave (Wave 1) included students who participated in a career counseling session within the first 30 days of the semester. The wave 1 participant data collection schedule was identical to the schedule of career course participants (weeks 4, 10 and 16). Wave 2 participants included students who completed at least one 50 minute counseling session at the career center within the next 30 days of the semester. The data collection for the Wave 2 participants was condensed. Participants were contacted in week 9, 14 and 16 of the academic semester. The week 16 data collection was identical for career course participants, Wave 1 and Wave 2 participants.

Pilot study. To assess the amount of congruence between student perceptions of what happens in the career counseling session and counselor perceptions, a pilot study was conducted. This study was completed over a 2 week period during the Spring of 2009. To control for overlap between the primary study and this study, all primary study career counseling data collection waves were completed prior to the start of the pilot study. As this study was exclusively interested in the level of correlation between assessments of session content, only the Critical Ingredients Scale was given. Each counselor was given a numbered stack of Critical

Ingredients scales to complete immediately after a career counseling session. Students were provided with consent forms and asked to also complete the assessment before they left the center. There was no subject remuneration for this study.

Analyses

Data collected in this investigation were analyzed using Hierarchical Linear Modeling (HLM). Traditionally, in repeated measures designs one may use multivariate analysis of variance (MANOVA) to analyze the data. However, researchers have called for more sophisticated statistical analyses to understand more about the complexities of client change (Ogrodniczuk, Piper, Joyce, & McCallum, 2001). HLM allows for the study of the structure of individual change over time. In addition, as attrition was an issue for this study, HLM is the method of choice since it allows for missing data in the repeated measures design. This allows the full maximization of the data and decreases the need to eliminate cases where the participant did not complete all three timepoints.

Elements of HLM. HLM is used to develop a prediction model, where the dependent variable is calculated as a function of both macro and micro factors (Snijders & Bosker, 1999). Hierarchical Linear Modeling or mixed level modeling has been utilized a great deal in educational research, where there are nested levels of influence (e.g. students, classes, schools, districts). This technique allows researchers to evaluate the individual and combined influences that these levels have on outcome. Nested data has shared variance between and within levels and violates the assumption of independence of variance structures. In repeated measures designs, the model also includes hierarchies of influence. However, repeated measures designs assess measurements within persons. In this case, Level 1 (micro level) is the various measurements of the outcome over time. The macro level (level 2), represents non-time varying

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aspects that may influence outcomes. HLM allows researchers to model the individual's unique

growth curve and hypothesize about the nature of the change.

HLM includes a number of unique terms and characteristics. These terms are used

frequently and are presented here as a way to ease in the interpretation of the scores and the

outcomes of this project. This section is intended to assist the reader in understanding the

models presented, however, it is not considered a comprehensive account of information on

HLM (for a comprehensive discussion of HLM, see Raudenbush, & Bryk, 2002 or Snijders &

Bosker, 1999).

At each level (macro and micro) that model estimates the coefficients for each predictor.

One coefficient is the intercept. The intercept is the initial value or base line of functioning of

the person. Models include testing whether the intercept is fixed or varies as a function of

another variable. The other coefficient of note is the slope. The slope is the rate of change

between the scores from Time 1 to Time 3. Random slopes indicate that the rates of increase

have two random components, one that is dependent on time and the other that is dependent on

the individual (Snijders & Bosker, 1999). This can also be described as a time by individual

interaction. HLM tests models that have both fixed and random effects. Fixed effects are simply

traditional regression analyses. Random effects are quantities that vary randomly from group to

group. Random effects are used when researchers want to test group level variables and explain

unexplained variability after fixed effects are analyzed (Snijders & Bosker, 1999).

Model testing. In order to develop the HLM model that best fits the data Snijders and

Bosker (1999) suggest going through various model building steps, where succeeding more

complicated models are analyzed. The model fit characteristics, including tests for fixed and

random effects, variance accounted for and deviance tests are examined to determine

significance. The exact tests used to evaluate the fixed and random portions of the model depend on the researcher's knowledge of the structure of his/her data, determining the best fit to obtain the most interpretable result. However, this is also a function of the statistical software used. Different software packages use different tests for fixed and random parameters. In this study, fixed parameters were evaluated by group using an *F* statistic and individually with a *t*-test with Satterthwaite-estimated degrees of freedom. This allows a way of proportionally adjusting the degrees of freedom to provide a p-value estimated to fit the population. Random effects were tested using the Wald z statistic. This statistic assumes that in larger samples ($N > 100$), the random factors approach a normal distribution (Raudenbush, & Bryk, 2002).

However, tests of fixed and random effects are simply preliminary tests of elements of the model. The full multilevel model is evaluated by examining the change in deviance tests (*-2 log likelihood* and Akaike's Information Criterion [AIC] are used in this study). These tests are used to compare the goodness of model fit. Each test is based in smallest is best terms, which means that the model that produces the smallest value, compared to simpler and (potentially) more complex models, is the one that provides the best assessment of the data (Snijders & Bosker, 1999).

Chapter 3

Results

This chapter is organized according to the data analytic steps that were used to evaluate the research questions. First, preliminary data screening procedures, including data cleaning, inclusion criterion, and missing data concerns are described. Next, I report the results of the pilot study assessing the level of consistency between counselor and student ratings of session content using Critical Ingredients Scale. Preliminary analyses are then described, including descriptive statistics and Pearson product moment correlations among primary variables of interest. Lastly, I report the results of the hierarchical linear modeling (HLM) analysis utilized to determine the effects of career interventions on outcome variables over time.

Data Screening

A five step approach to data screening was completed, which involved examination of the following: (a) accuracy of the data, (b) missing data, (c) outliers, (d) normality distributions, and (e) appropriateness of data transformations (Tabachnick & Fidell, 2006). A check for data accuracy was first conducted by examining the frequency tables and box plots on all of the variables presented in this study. Any outliers that could be easily interpreted by the researcher as incorrect were either removed or corrected. Given the nature of the data collection (online survey) there were no input errors to correct. However, there were a number of duplicate and missing data that were addressed. Given the longitudinal nature of the project, there was a great deal of missing data to account for. Data inclusion was evaluated on completeness of the entire survey (approximately 75% of questions of at least one survey) and at least 90% (16 out of 18 questions) on the Critical Ingredients Scale at one of the three time points. Univariate and multivariate outliers were removed from analyses.

As suggested by Tabachnick & Fidell (2006), I examined skewness and kurtosis for the subscale and total scale scores of each scale. When data sets from all time points across the two conditions (counseling and courses) were combined, most scales demonstrated skewness and kurtosis within the acceptable range of a z score less than 3.3 (Tabachnick & Fidell, 2006). All scales demonstrated kurtosis scores within acceptable limits. However, Critical Ingredients scores on Time 1, Time 2 and Time 3 were found to be highly skewed when analyzed within group. The critical ingredients scale was assessed in a class, where theoretically each person in the class would have the same amount and in short-term counseling, which was problem focused and only incorporated pertinent information. It was not expected that the critical ingredients variables as assessed in this study would be normally distributed. However, when treatment groups were combined, the scales did approach a normal distribution, with total scale scores of Time 1 being within acceptable limits. Kolmogorov-Smirnov tests indicated significant results (non-normal distributions) for Time 2 and Time 3 total scale (T2 KS (z) = 1.65, T3 KS (z) = 1.89) and Time 1, Time 2 and Time 3 critical items (T1 KS (z) = 2.85, T2 KS (z) = 2.71 and T3 KS (z) = 2.67).

Tests of homogeneity of variances (Levene's test and F-Max tests) indicated that Critical items did have comparable variance structures. Generally, analyses utilized in this investigation (Pearson Product Moment Correlation, ANOVA, and HLM) are robust to mild deviations from normality, but more sensitive to violations in homogeneity of variance. In addition, to ensure accuracy of results, data transformations were performed on critical items scale scores. Since scores were negatively skewed, the data were transformed by subtracting each score from a constant (K), which is the highest possible value for the score plus 1, then the square root of the resultant value was taken. After transformation, Kolmogorov-Smirnov tests resulted in non-

significant results, thus skewness was corrected. All statistics were calculated again, using transformed variables. These tests yielded results similar to previous analyses with non-transformed data. As data transformation distorts the interpretability of scale scores, non-transformed scores are presented here.

Pilot Study Data Analysis

To determine the amount of agreement between counselor and student ratings of session content using the Critical Ingredients Scale, a pilot study was conducted. The Critical Ingredients Scale consists of 18 items. The first 5 items (critical ingredients items 1-5) are considered to be the "critical items" and have the most effect on outcome (Brown, et. al., 2003). Analyses in this chapter are presented for both total scale and critical ingredients items 1-5. The mean for number of critical ingredients items 1-5 was 3.48 ($SD = 1.08$) for students and 2.00 ($SD = 1.15$) for counselors. The mean for the total scale was 9.84 ($SD = 3.47$) for students and 5.56 ($SD = 2.66$) for counselors. Overall, students reported more critical ingredients than counselors. Pearson product moment correlations were preformed to examine the associations among aggregated counselor and student scores. No significant relations were found between the overall number of counselor endorsed session elements and student ratings (See Table 4). The aggregation of participant data by counselor and student was useful in understanding the overall degree of association between ratings. However, it fails to account for individual level differences and degrees of association for counselor-student dyads. Thus, additional measures of association and reliability were conducted on the individual level to further understand the relations between counselor and student assessments of session content.

Table 4

Intercorrelations Between Counselor and Student Ratings

Measure	1	2	3	4	*M* (*SD*)
1. Crit 1-5 (student)	1	-.07	.80[**]	-.14	3.48 (1.08)
2. Crit 1-5 (counselor)	-.07	1	-.17	.81[**]	2.00 (1.15)
3. Crit all (student)	.80[**]	-.17	1	-.25	9.84 (3.47)
4. Crit all (counselor)	-.14	.81[**]	-.25	1	5.56 (2.66)

Note. $N = 48$. Crit 1-5 = Critical Ingredients Scale items 1-5; Crit All = Critical Ingredients Scale total score.
* $p < .05$, ** $p < .01$.

Inter-rater agreement was assessed using three measures of agreement, percent agreement, Cohen's kappa and Krippendorff's alpha (See Table 5 for pair wise values). These ratings were also aggregated across all participants to provide an estimation of the overall associations between counselor and student ratings. Percent agreement is calculated by dividing the number of identical paired responses by the number of possible pairs. For all returned paired surveys, the percent agreement between counselor and student ratings ranged from 0.00% to 88.89%. However, it was noted that one pair of surveys included no congruent responses and thus their agreement was 0.00%. Item level analysis revealed a large amount of missing data for the counselor ratings. This pair was dropped from analyses and agreement statistics were conducted based on 24 pairs of surveys. The average percent agreement across all included counselor-student dyads was 63.19%. However, as percent agreement provides a percentage statistic, there is no way to determine the relative significance of this estimate (Stemler, 2004). Thus, other statistical measures were calculated to further understand the potential significance of the relations between counselor and student ratings of session content. For a through overview of the consistency analytic techniques used in this study see Stemler (2004).

Table 5

Measures of Agreement for Pilot Study Data Pairs

Pair	Percent agreement	Cohen's kappa	Krippendorff's alpha	n = agree	n = disagree
1	72.22	0.46	0.46	13	5
2	72.22	0.44	0.44	13	5
3	77.78	0.50	0.51	14	4
4	22.22	0.03	-0.51	4	14
5	66.67	0.22	0.19	12	6
6	38.89	0.01	-0.13	7	11
7	11.11	0.01	-0.73	2	16
8	55.56	0.19	0.13	10	8
9	72.22	0.44	0.46	13	5
10	50.00	0.11	0.00	9	9
11	55.56	0.11	0.13	10	8
12	66.67	0.30	0.32	12	6
13	66.67	0.31	0.32	12	6
14	66.67	0.42	0.38	12	6
15	77.78	0.57	0.56	14	4
16	72.22	0.44	0.44	13	5
17	61.11	0.26	0.21	11	7
18	66.67	0.40	0.35	12	6
19	44.44	0.12	-0.14	8	10

(continued)

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Table 5 (continued)

Pair	Percent agreement	Cohen's kappa	Krippendorff's alpha	n = agree	n = disagree
20	88.89	0.68	0.69	16	2
21	88.89	0.77	0.77	16	2
22	88.89	0.73	0.73	16	2
23	72.22	0.48	0.46	13	5
24	61.11	0.32	0.26	11	7
Mean	63.19	0.35	0.26	11.38	6.63
Min	11.11	0.01	-0.73	2.00	2.00
Max	88.89	0.77	0.77	16.00	16.00

Cohen's kappa statistic (Cohen, 1960) was developed to account for the amount of agreement that would be expected due to chance alone. In addition, values close to zero indicate agreement that is not significantly different than what would be found based on chance. Kappa statistics in this sample ranged from 0.01 to 0.77. Previous studies have designated kappa statistics ranging from 0.41 to 0.60 to be moderate and values above 0.61 as substantial (Landis & Koch, 1977). More stringent interpretation guidelines suggest that scores less than 0.67 should not be interpreted, scores from 0.67 to 0.80 allow for tentative conclusions and scores greater than 0.80 provide definite conclusions (Krippendorff, 2004). The average Cohen's kappa score, calculated by obtaining the mean of the kappa score for each counselor-student dyad, was 0.35, which suggest overall non-significant findings.

As Cohen's kappa has been found to be an overly conservative measure of inter-rater agreement (Hayes & Krippendorff, 2007), Krippendorff's alpha was also calculated to examine the degree of agreement between counselor and student ratings. Krippendorff's alpha measures

the degree of agreement between coders by examining the number of disagreements and correcting for the level of agreement that would be expected when the units are statistically unrelated to their descriptions (Hayes & Krippendorff, 2007). In addition, it is sensitive to more complex designs (e.g. more than 2 coders, ordinal/ratio data, and small samples). Krippendorff's alpha estimates in this study ranged from -0.73 to 0.77, with an overall mean of 0.26. It has been stated that Krippendorff's alpha estimates of 0.800 or greater represent interpretable results and estimates of 0.667 to 0.799 can represent tentative results (Krippendorff, 2009). Therefore, as measured by multiple methods, the inter-rater reliability between counselor and student ratings of session content was not significant.

Descriptive Statistics

Group differences among variables of interest were assessed. The demographic groups of interest were: sex, race, year in school and treatment condition (i.e. counseling or courses). In addition, group differences were assessed between survey Time 2 and Time 3 completers and dropouts on Time 1 variables. Means, standard deviations, and analyses of variance are presented by subgroup.

Sex. Univariate analyses of variance (ANOVAs) were conducted to determine if there were any mean differences between males and females among the variables used in this study. Females ($M = 24.44$; $SD = 6.12$) did exhibit significantly higher levels of commitment anxiety than males ($M = 20.81$; $SD = 6.09$), $F(1, 87) = 6.51$, $p = 0.01$. There were no sex differences in other outcome variables or critical ingredients measures.

Race. Univariate analyses of variance (ANOVAs) were conducted to determine if there were any mean differences between participants, stratified by racial category, among the variables used in this study. Table 6 presents means and standard deviations for each group,

degrees of freedom, *F* statistics and proportion of variance (η^2). There were significant racial differences among Time 1 Career Decision Making Self-Efficacy total and scale scores. Eta squared (η^2) was used to estimate the proportion of variance accounted for by the variable and determine effect size. Cohen (1988) suggested that for a small effect $\eta^2 = .01$; for a moderate effect $\eta^2 = .09$; and a large effect $\eta^2 = .25$. Small to moderate effects were observed here. Post hoc comparisons with Tukey's statistic showed that significant differences existed between Asian and Black and Asian and Latino groups (all *p*s<.05). No significant differences were found between White or Multiracial participants with any other group.   For Time 3, there were no significant differences in study variables by race.

Table 6

Analysis of Variance by Race

Measure	*M*	*SD*	*df1/df2*	*F*	*Sig*	η^2
T1 CDMSE total						
Asian	119.62	30.20	4/256	5.43	.00**	.08
Black	145.03	32.74				
Latino	154.77	35.17				
White	133.55	29.49				
Multiracial	150.25	30.65				
T1 CDMSE SA						
Asian	25.50	6.50	4/256	3.21	.01**	.05
Black	30.24	7.51				
Latino	30.92	6.68				
White	27.63	6.58				
Multiracial	29.92	6.79				

(continued)

Table 6 (continued)

Measure	M	SD	df1/df2	F	Sig	η²
T1 CDMSE OI						
Asian	24.82	7.33	4/256	3.55	.01**	.05
Black	29.50	7.40				
Latino	31.08	7.62				
White	28.45	6.76				
Multiracial	31.50	6.69				
T1 CDMSE GS						
Asian	23.15	6.53	4/256	4.89	.00**	.07
Black	29.55	6.95				
Latino	31.15	7.63				
White	25.91	8.01				
Multiracial	28.75	6.82				
T1 CDMSE PLAN						
Asian	23.03	7.80	4/256	5.88	.00**	.08
Black	28.97	7.33				
Latino	30.62	7.23				
White	25.75	6.92				
Multiracial	31.17	8.19				
T1 CDMSE PS						
Asian	23.12	7.81	4/256	3.80	.01**	.06
Black	26.76	7.82				
Latino	31.00	7.46				
White	25.81	6.56				
Multiracial	28.92	6.49				

Note. T1 = Time 1; CDMSE total = Career Decision Making Self-Efficacy total; CDMSE SA = CDMSE Self-Appraisal; CDMSE OI = CDMSE Occupational Information; CDMSE GS = CDMSE Goal Selection; CDMSE PLAN = CDMSE Planning; CDMSE PS = CDMSE Problem Solving.
* $p < .05$, ** $p < .01$.

Year in School. To determine if there was statistically significant difference among participants stratified by year in school, one-way analysis of variance (ANOVA) were conducted. The result revealed that there were statistically significant differences between mean scores on various study variables between various year in school cohorts (freshman, sophomore, junior, senior, and graduate/professional student) (see Table 6). Post hoc comparisons with Tukey's statistic suggest that significant differences existed between senior and freshman and senior and sophomore groups (all ps<.05). Small to moderate effect sizes were observed. No significant differences were found between other groups.

Table 7

Analysis of Variance by Year in School

Measure	M	SD	df1/df2	F	Sig.	η^2
T1CDMSE total						
Freshman	123.87	25.92	4/256	5.86	.00**	.08
Sophomore	129.33	28.26				
Junior	135.68	35.29				
Senior	146.95	31.49				
Graduate/Professional	154.33	48.76				
T1CDMSE SA						
Freshman	26.07	6.34	4/256	3.59	.01**	.05
Sophomore	27.15	6.34				
Junior	27.70	7.55				
Senior	29.93	6.77				
Graduate/Professional	33.67	9.29				

Table 7 (continued)

Measure	M	SD	df1/df2	F	Sig.	η^2
T1CDMSE GS						
Freshman	23.41	6.84	4/256	7.56	.00**	.11
Sophomore	24.63	8.01				
Junior	27.40	7.79				
Senior	29.39	7.08				
Graduate/Professional	35.00	6.24				
T1CDMSE PL						
Freshman	23.54	5.92	4/256	7.53	.00**	.11
Sophomore	24.63	7.22				
Junior	26.55	7.94				
Senior	29.54	6.97				
Graduate/Professional	30.00	11.36				
T1CDMSE PS						
Freshman	23.93	6.24	4/256	4.04	.00**	.06
Sophomore	24.90	6.06				
Junior	25.80	8.78				
Senior	28.39	7.06				
Graduate/Professional	27.00	12.12				
T1CRIT 1-5						
Freshman	3.37	1.41	4/244	2.50	.04*	.04
Sophomore	3.61	1.31				
Junior	2.97	1.61				
Senior	3.03	1.54				
Graduate/Professional	2.33	1.15				

Table 7 (continued)

Measure	M	SD	df1/df2	F	Sig.	η^2
T1CRIT all						
Freshman	10.95	4.32	4/244	3.85	.00**	.06
Sophomore	11.84	4.36				
Junior	9.97	4.04				
Senior	9.27	4.68				
Graduate/Professional	9.33	3.79				
T3 CDMSE total						
Freshman	128.13	31.95	4/89	4.18	.00**	.16
Sophomore	142.50	33.87				
Junior	151.59	25.81				
Senior	162.78	24.25				
Graduate/Professional	188.00	.				
T3 CDMSE SA						
Freshman	25.67	7.28	4/89	3.61	.01**	.14
Sophomore	28.94	7.32				
Junior	31.29	4.95				
Senior	32.30	5.33				
Graduate/Professional	40.00	.				
T3 CDMSE OI						
Freshman	27.33	7.58	4/89	2.72	.03*	.11
Sophomore	30.65	6.91				
Junior	32.47	6.35				
Senior	33.63	5.46				
Graduate/Professional	38.00	.				

Table 7 (continued)

Measure	M	SD	df1/df2	F	Sig.	η^2
T3 CDMSE GS						
Freshman	24.13	8.74	4/89	3.80	.01**	.15
Sophomore	26.44	8.73				
Junior	29.18	4.97				
Senior	32.15	5.94				
Graduate/Professional	35.00	.				
T3 CDMSE PL						
Freshman	25.73	6.89	4/89	4.07	.00**	.15
Sophomore	29.15	7.82				
Junior	29.59	6.02				
Senior	33.63	5.42				
Graduate/Professional	39.00	.				
T3 CDS CERT						
Freshman	4.93	1.94	4/89	3.52	.01**	.14
Sophomore	5.21	2.07				
Junior	5.94	0.97				
Senior	6.56	1.09				
Graduate/Professional	6.00	.				

Note. T1 = Time 1; T2 = Time 2; T3 = Time 3; CDMSE SA = CDMSE Self-Appraisal; CDMSE GS = CDMSE Goal Selection; CDMSE PL = CDMSE Planning; CDMSE PS = CDMSE Problem Solving; CRIT 1-5= Critical Ingredients Scale items 1-5; CRIT ALL = Critical Ingredients Scale total score; CDS CERT = Career Decision Making Certainty Scale.
* $p < .05$, ** $p < .01$.

Group. ANOVA was utilized to assess differences on outcome variables by treatment

condition (courses vs counseling). These analyses are a first step in answering the research

question: how do outcomes differ by type of career intervention? Analyses found no mean

differences for decision making or role functioning variables between the different treatment

conditions. However, there were significant differences in number of critical ingredients and

initial satisfaction experienced by each treatment condition (see Table 8). For each time point

Courses participants reported experiencing higher numbers of critical ingredients. Students who

participated in counseling reported statistically significantly higher rates of satisfaction with the

intervention on Time 1. Effect size estimates (η^2) demonstrated large effects for treatment

differences for Time 1, Time 2, and Time 3 critical ingredients total scores and Time 1 critical

ingredients items 1-5. Moderate effect sizes were observed for Time 1 and Time 3 critical

ingredients items 1-5. A small effect was observed for satisfaction. There were no significant

differences in satisfaction on Time 2 or Time 3.

Table 8

Analysis of Variance by Treatment Group

Measure	M	SD	df1/df2	F	Sig.	η^2
T1Crit 1-5						
Courses	3.87	1.17	1/247	57.82	.00**	.19
Counseling	2.59	1.49				
T1 Crit all						
Courses	12.97	3.29	1/247	119.20	.00**	.33
Counseling	7.83	4.13				
T2 Crit 1-5						
Courses	4.12	1.05	1/125	52.49	.00**	.30
Counseling	2.15	1.42				
T2 Crit all						
Courses	14.16	3.13	1/125	102.37	.00**	.45
Counseling	6.55	2.84				
T3 Crit 1-5						
Courses	4.26	0.98	1/93	10.30	.00**	.10
Counseling	3.42	1.17				

Table 8 (continued)

Measure	M	SD	df1/df2	F	Sig.	η^2
T3 Crit all						
Courses	15.07	3.29	1/93	34.96	.00**	.27
Counseling	9.84	4.03				
Satisfaction						
Courses	3.55	1.08	1/261	14.66	.00**	.05
Counseling	4.05	1.04				

Note. T1 = Time 1; T2 = Time 2; T3 = Time 3; Crit 1-5= Critical Ingredients Scale items 1-5; Crit all = Critical Ingredients Scale total score.
* $p < .05$, ** $p < .01$.

Attrition. Univariate analyses of variance (ANOVAs) were conducted to determine if there were any mean differences between people who completed Time 2 and those that did not in each condition. When participants were separated by condition, no significant mean differences were found on Time 1 variables between people who completed Time 2 and/or Time 3. However, there were significant mean differences found on Critical Ingredient Scale Time 1 variables when these samples were aggregated. People who completed Time 2 did experience higher levels of Critical Ingredients items 1-5 ($M = 3.63$; $SD = 1.36$) compared to people who dropped out after Time 1 ($M = 2.89$; $SD = 1.49$), $F (1, 247) = 16.37$, $p < .01$. All Critical Ingredients experienced also produce significant differences between people who completed Time 2 ($M = 11.95$; $SD = 3.99$) compared to people who dropped out after Time 1 ($M = 9.08$; $SD = 4.57$), $F (1, 247) = 27.82$, $p < .01$. However, as counseling participants were over-represented in treatment drop-outs, these mean differences reflect the differences in number of critical ingredients experienced by treatment condition.

Correlations

      Pearson Product Moment Correlations were calculated to examine the associations among variables used in this study. As the decision-making and psychological variables (Career Decision Making Self-Efficacy, Career Decision Making and Career Thoughts Inventory) are related concepts, it was expected that correlations would exist between these scales. In addition, it was also expected that there would be relations between scores on repeated variables. Table 9 illustrates the intercorrelations between Time 1 and Time 3 Career Decision Making Self-Efficacy (CDMSE) total and subscale scores; Time 3 Career Decision Making Scale (CDS) Certainty and Indecision subscales, and Time 3 Career Thoughts Inventory (CTI) total and subscale scores. Significant relations were identified between all Time 1 and Time 3 Career Decision Making Self-Efficacy total and subscale scores (all $ps<.01$).

Table 9

Summary of Intercorrelations Among Outcome Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. T1CDMSE TOT																	
2. T1CDMSE SA	.88**																
3. T1CDMSE OI	.78**	.57**															
4. T1CDMSE GS	.89**	.80**	.54**														
5. T1CDMSE PL	.90**	.71**	.68**	.74**													
6. T1CDMSE PS	.88**	.73**	.60**	.72**	.76**												
7. T3 CDMSE TOT	.68**	.55**	.57**	.57**	.62**	.59**											
8. T3 CDMSE SA	.66**	.65**	.45**	.61**	.57**	.54**	.92**										
9. T3 CDMSE OI	.44**	.26*	.61**	.26*	.42**	.38**	.80**	.64**									
10. T3 CDMSE GS	.68**	.60**	.44**	.70**	.56**	.59**	.89**	.85**	.55**								
11. T3 CDMSE PL	.59**	.44**	.55**	.46**	.61**	.48**	.93**	.82**	.75**	.78**							
12. T3 CDMSE PS	.59**	.45**	.46**	.46**	.56**	.61**	.87**	.72**	.61**	.71**	.78**						
13. T3 CDS CERT	.59**	.51**	.33**	.66**	.48**	.50**	.66**	.66**	.31**	.78**	.60**	.53**					
14. T3 CDS IND	-.30**	-.32**	-.13	-.32**	-.19	-.30**	-.22*	-.24*	-.17	-.31**	-0.18	-0.07	-.25*				
15. T3 CTI TOT	-.43**	-.43**	-.25*	-.41**	-.32**	-.39**	-.32**	-.32**	-.01	-.40**	-.28**	-.28**	-.40**	.65**			
16. T3 CTI DMC	-.72**	-.64**	-.40**	-.74**	-.65**	-.66**	-.57**	-.58**	-.21	-.70**	-.47**	-.53**	-.67**	.38**	.59**		
17. T3 CTI CA	-.59**	-.47**	-.34**	-.64**	-.55**	-.53**	-.35**	-.31**	-.07	-.52**	-.27*	-.34**	-.59**	.25*	.42**	.73**	
18. T3 CTI EC	-.32**	-.27**	-.28**	-.23**	-.28**	-.34**	-.18	-.13	-.10	-.18	-.17	-.23	-.19	.17	.46**	.47**	.44**

Note. T1 = Time 1; T2 = Time 2; T3 = Time 3; CDMSE TOT = CDMSE total; CDMSE SA = CDMSE Self-Appraisal; CDMSE OI = CDMSE Occupational Information; CDMSE GS = CDMSE Goal Selection; CDMSE PL = CDMSE Planning; CDMSE PS = CDMSE Problem Solving; CDS CERT = CDS Certainty; CDS IND = CDS Indecision; CTI TOT = CTI total; T3 CTI DMC = CTI Decision Making Confusion; CTI CA = CTI Commitment Anxiety; CTI EC = External Conflict.
* p < .05, ** p < .01.

As the effect of Critical Ingredients is a foci of this study, the correlations between

Critical Ingredients scores and all outcome variables were explored. Significant relations were

also found between Critical Items scores and Career Decision Making Self- Effacacy. Subscale

analysis (See Table 10) revealed the strongest positive associations between the Time 2 Critical

Items and Time 3 CDMSE total scale ($r = .31$, $p < .01$), T3 CDMSE self appraisal ($r = .31$, $p <$

$.01$), T3 CDMSE occupational information ($r = .28$, $p = .02$), T3 CDMSE goal selection ($r = .26$,

$p = .02$), and T3 CDMSE planning ($r = .34$, $p < .01$).

Table 10

Intercorrelations Between Critical Ingredients and Outcome Measures

Measure	T1Crit 1-5	T1Crit all	T2 Crit 1-5	T2Crit all	T3 Crit 1-5	T3Crit all
T1CDMSE total	.01	.05	-.08	-.08	.01	.07
T1CDMSE SA	.03	.10	-.08	-.05	.09	.13
T1CDMSE OI	.05	.10	.09	.10	.11	.16
T1CDMSE GS	-.03	.02	-.10	-.07	.03	.09
T1CDMSE PL	-.07	-.03	-.15	-.16	-.07	-.06
T1CDMSE PS	.04	.03	-.06	-.13	-.09	-.03
T3 CDMSE total	.17	.23*	.30*	.31**	.22*	.22*
T3 CDMSE SA	.14	.19	.28*	.31**	.21*	.21*
T3 CDMSE OI	.17	.20	.26*	.28*	.24*	.23*
T3 CDMSE GS	.15	.23*	.26*	.26*	.19	.21*
T3 CDMSE PL	.11	.19	.33**	.34**	.23*	.18
T3 CDMSE PS	.17	.19	.18	.18	.11	.12
T3 CDS CERT	.06	.13	.07	.10	.04	.04
T3 CDS IND	-.10	.01	-.16	-.13	-.05	-.03

Note. T1 = Time 1; T2 = Time 2; T3 = Time 3; CDMSE SA = CDMSE Self-Appraisal; CDMSE OI = CDMSE Occupational Information; CDMSE GS = CDMSE Goal Selection; CDMSE PL = CDMSE Planning; CDMSE PS = CDMSE Problem Solving; CDS CERT = CDS Certainty; CDS IND = CDS Indecision.
* $p < .05$, ** $p < .01$.

Hierarchical Linear Modeling (HLM) Analysis

This study utilized a repeated measures design to assess change in participants as they experienced two different career interventions. Hierarchical Linear Modeling (HLM) with a longitudinal design, allows for missing data, and a better estimation of individual patterns of change (Snijders & Bosker, 1999). Specifically, growth curve model analysis was used to study the effects of time and intervention type (counseling vs. courses) on the development of change in attitudinal variables (Career Decision Making Self-Efficacy). This analysis also allows for the inclusion of other relevant, individual level variables, such as demographic characteristics and Critical Ingredients experienced. In longitudinal analyses, Level 1 variables represent the repeated measures over function of time. In this study, variables entered as level 1 predictors of Career Decision Making Self-Efficacy were Time (linear and quadratic) and repeated assessments (Critical Ingredients and CDMSE). Level 2 variables represent the between individuals model, and includes the change that occurs as a function of the person's group characteristics. Level 2 variables are fixed over time. The Level 2 predictors utilized in this study were treatment condition (i.e. counseling or course), gender, year in school and race.

Data for individuals and across groups were graphed to assess potential relations between variables. Based on the graphic representations of the data, various models, with increasing levels of complexity, were examined. Significance for both the fixed and random parameters was tested and non-significant predictors were dropped from the model. Model fit indicators, including *p*-values, coefficients and likelihood ratio tests (*-2 log likelihood*), were compared across models to determine the model that best fit the data. Table 10 displays the model fit characteristics for each model tested. All models were run using raw scores for variables of interest. This was done because many of the variables have true 0 points and centering would be

inappropriate. In addition, few studies have examined these variables in a way similar to this study and there is no reliable theoretical basis for centering the variables presented. Previous research has discussed at length the benefits and risks of centering variables. Kreft and colleagues (1995) cautioned that mean centering should be done with a theoretical (rather than statistical) basis.

The first model (model 1) presented is an unconditional random effects or null model to provide a baseline for measuring if more complex models, with fixed and random predictors, are better explanations of the data. This model is equivalent to a one-way ANOVA model with random effects. This model predicts the level 1 intercept as a random effect of the grouping variable (level 2). In this case, the model did not include any other predictors at level 1 or level 2. The amount of variance accounted for was calculated by dividing the between subjects variance (intercept) by the total variance (intercept and residuals). In this initial model 64.5% of the total variance can be explained by between subject variables. The remaining 35.5% of the total variance is attributable to within subject factors. Level-2 intercepts differed significantly among individuals, indicating that at baseline, decision making self-efficacy scores varied between participants, Wald $z = 7.11$, $p < .001$. Similarly, the mean intercept across all time points was statistically significant, $t(261) = 72.82$, $p < .001$. More complex models may be able to explain a larger proportion of the total variance.

Next, the first model was extended and fixed effects were added. These models (2 and 3) are conditional random effects models. Model 2 represents a random intercepts model because time (Timepoint) was added as a fixed effect predictor for level 1, $F(1,116.12) = 20.52$, $p < .001$. Since the data has repeated measures, this model tests the assumption that subjects scores on the dependent variable change over time. In this model, the intercept is again entered as a random

effect. The Wald z test was evaluated to determine if between-subjects effects impact the outcome variable. The significant results demonstrated that between-subjects effects account for approximately 68.5% of the variance in attitude scores is attributed to between subjects variability, Wald $z = 7.62$, $p < .001$.

In model 3 other level 1 and level 2 predictors were added as fixed effects. The level 1 predictors included in the model were timepoint ($F[1, 123.82] = 13.30$, $p < .001$), and number of critical ingredients ($F[1, 328.37] = 2.35$, $p = .13$). The level 2 predictors included in this model are race ($F[4, 242.05] = 2.93$, $p = .02$) and year in school ($F[4, 235.27] = 8.21$, $p < .001$). In addition, repeated effects were added for time point to specify the shared error variance between repeated measures. These analyses found that treatment group (counseling vs. courses), age and gender were not significant level 2 predictors of attitude scores and excluded from further analyses. This model was calculated again, with only the significant predictors and this equations and fit statistics were included in model comparison. Snijders and Bosker (1999) stated that if there was a theoretical reason for inclusion, some non-significant predictors can be allowed to remain a model. Critical ingredients, though not statistically significant in this model, was retained to further examine the potential influence in other models. The model fit statistics, including variance accounted for and deviance are presented in Table 10.

Third, additional random coefficients models were tested. The simplest case of a random coefficient model is a random intercept model (i.e. Models 2 and 3). Random coefficient models can also include additional estimates of random factors on level 1 and possibly, level 2. Potential models for random effects of Level 1 variables were explored. Level 1 variables were initially tested individually for the potential for random slopes and then other explanatory variables were added as fixed effects.

Time was calculated in four ways in this study to provide the most comprehensive assessment of the influence of time on subject's scores. Numeric representations of the number of time points was added as a variable, referred to as Timepoint. Secondly, the continuous assessment of time was found by calculating the number of days from the beginning first day of the Fall semester that the participant took each survey (referred as Time). This variable was calculated in the same manner for counseling and courses participants. The Time variable was included both uncentered and grand mean centered to assess the relative distance between the time each participant completed the survey and their peers. In addition, the centered time value was squared to obtain the quadratic assessment of time ($Time^2$). Quadratic time assessment allows researchers to explore more complex, non-linear effects of time on participant outcomes.

The fixed and random effects of linear assessments of time were not significant. However, there was a significant fixed effect for the centered quadratic assessment of time ($F[1, 25.96] = 11.25$, $p = .002$). In model 4, the quadratic assessment of time was then added to an unconditional means model as a random predictor to assess for the possibility of a random slopes model for time. This model revealed that quadratic time was a significant predictor of attitude scores, with a significant random intercept. This means that each participant is allowed to have a unique intercept or time value. However, the Wald z test also revealed that there was not significant evidence that quadratic time has a random slope (Wald $z = 0.13$, $p = .90$).

Additional time-related (level 1) variables were tested for random slopes. The only other variable that produced a random slope was the Critical Ingredients total score. In model 5, Critical Ingredients total score was added in a simple model with no additional explanatory variables. There was a significant fixed effect for total number of Critical Ingredients ($F[1, 182.64] = 8.10$, $p = .005$). Wald z tests demonstrated significance for random intercepts (Wald z

= 3.82, $p < .001$) and approaching significance for random slopes (Wald $z = 1.86$, $p = .06$). The covariance between the two random effects, each case and number of critical ingredients, was negative. This indicates the higher the random effect for the intercept (each subject), the smaller the random effect of the critical ingredients slope. This indicates the higher beginning attitude scores, the less influence critical ingredients had on outcomes.

Next a mixed model was examined, including all of the significant predictors indicated in previous analyses. Model 6 included fixed effects for level 2 predictors, race ($F[4, 230.02] = 2.56$, $p = .04$) and year in school ($F[4, 217.13] = 9.71$, $p < .001$), and level 1 variables, total Critical Ingredients ($F[1, 197.93] = 7.33$, $p = .007$) and quadratic time ($F[1, 153.99] = 10.55$, $p = .001$). When quadratic time was added to the initial multilevel model, the previous predictor, timepoint, became non-significant and thus dropped from further analyses. This indicates that the centered quadratic calculation for time was a better predictor of the change in attitude scores. This model also includes total number of critical ingredients as a significant random effect (Wald $z = 3.85$, $p < .001$). There were no significant cross level interactions. To indicate the presence of random slopes, the error associated with critical ingredients was also added to the model (Wald $z = 2.42$, $p = .02$). When comparing deviance scores, Wald statistics and variance accounted for (Table 10), this model was the best fit for the data. This model reduced the estimated residuals (unaccounted for variance in the model) by 36.5%. When examining the deviance scores of model 6 compared to the null model (model 1), model 6 provides a remarkable difference and better fit for the data.

The final model is:

Level 1-- $Y_{ij}(CDMSE) = \beta_{0j} + \beta_{1j}(Time^2)_{ij} + \beta_{2j}(Crit\ all)_{ij} + R_{ij}$

Level 2-- $\beta_{0j} = \gamma_{00} + \gamma_{01}(Crit\ all)_j + \gamma_{02}(Year\ in\ School)_j + \gamma_{03}(Race)_j + U_{oj}$

$$\beta_{1j} = \gamma_{10} + U_{1j}$$

$$\beta_{2j} = \gamma_{20}$$

The final HLM model demonstrates the potential predictive value of both demographic variables on level 2 and treatment variables on level 1. The parameter estimates can be used to assess the potential effect of various factors on participant's decision making self-efficacy scores. For example, on Time 1, the predicted coefficient for freshman student's decision making self-efficacy scores would be: 153.4 (intercept) – 38.89 (freshman estimate) = 114.51.

Table 11

Fixed Effects Estimates (Top) and Variance-Covariance Estimates (Bottom) for Models of the Predictors of Career Decision Making Self-Efficacy

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
			Fixed Effects			
Intercept	137.78 (1.89)	146.63 (2.71)	165.75 (19.69)	132.42 (2.49)	124.99 (5.05)	153.4 (18.95)
Level 1 (Time varying)						
Timepoint = 1		-11.2 (2.47)	-9.88 (2.71)			
Timepoint = 3		--	--			
Time^2				4.49 (1.34)		4.3 (1.32)
Crit all			0.59 (0.38)		1.13 (0.40)	1.11 (0.41)
Level 2 (Time invariant)						
Race = Asian			-21.56 (10.43)			-20.1 (10.45)
Race = Black			-1.73 (10.21)			-2.61 (10.1)
Race = Latino/a			4.51 (12.15)			4.71 (11.83)
Race = White			-10.31 (9.22)			-9.68 (9.18)
Race = Multiracial			--			--
School year = fresh			-31.39 (17.10)			-38.89 (16.61)

(continued)

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Table 11 (continued)

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
School year = soph			-23.98 (16.87)			-31.71 (16.39)
School year = junior			-17.04 (17.21)			-24.12 (16.72)
School year = senior			-3.5 (16.85)			-9.71 (16.39)
School year = grad			--			--
			Random parameters			
Level 2 (individual random effects)						
Intercept variance (τ^2)	659.15 (92.69) **	681.05 (89.36) **	549.76 (84.59) **	715.21 (150.00) **	1468.25 (385.16) **	1494.64 (388.10) **
Crit all slope					4.47 (2.40)	6.18 (2.56) *
Crit all int-slope cov					-62.61 (29.30) **	-79.98 (30.76) **
Time^2 slope			3.89 (30.82)			
Time^2 int-slope cov			-14.98 (58.32)			
Level 1 (occasion variance)						
Residual variance (σ^2)	362.6 (53.53) **	312.87 (46.67) **	326.27 (49.58) **	323.59 (64.4) **	306.04 (43.26) **	267.39 (44.05) **
-2log likelihood	3424.56	3401.47	3160.65	3411.47	3270.23	3153.24
AIC	3428.56	3405.47	3164.65	3419.47	3278.23	3161.24

Note. Standard errors are in parentheses. Crit all slope = Slope variance of Critical Ingredients total scale score; Crit all int-slope cov = the covariance between the random intercept and random slope for Critical Ingredients total scale score; Time^2 slope = Slope variance of quadratic estimate of time; Time^2 int-slope cov = the covariance between the random intercept and random slope for the quadratic estimate of time.
* $p < .05$, ** $p < .01$.

Chapter 4

Discussion

The purpose of this investigation was to explore the dynamics and impact of career interventions. Specifically, it addressed three interconnected research questions: (1) What are the outcomes of various career related interventions (i.e. career counseling and taking a career exploration course)? (2) How do these outcomes differ by type of career intervention? and (3) Which *critical ingredients* are present in these interventions; and how do critical ingredients affect outcomes? In this chapter, I discuss the findings of the analyses and how they relate to the research questions of this investigation and then situate these findings within the relevant extant literature. I also describe limitations of the present investigation and provide suggestions for future research and career interventions.

Pilot Study Findings

While not specifically related to one of the research questions, the findings from the pilot study provided interesting information to base our understanding of the dynamics of the career counseling process. It was previously assumed that counselor and student ratings of session content would have a high level of agreement. However, analysis showed that there was no significant level of agreement between counselor and student assessment of session content. The average number of critical ingredients reported by students was approximately 77% larger than that reported by counselors. In addition, the number of consistent responses varied greatly between groups. Some pairs had only 2 out of 18 agreements, while others had 16 out of 18 agreements.

As the degree of agreement between counselor and student ratings of session content varied so greatly, it is possible that these scores are influenced by another confounding variable.

One potential confound to these data is that the conceptual meaning of the elements of the critical ingredients scale is not the same for the student and the counselor. The items of the critical ingredients scale are well known concepts in career theory/vocational psychology (e.g. modeling, decision-making, or world of work). Therefore, the counselors had a higher level of understanding of the item, whereas most students are unaware of career theory and could only interpret based on the description provided. Thus, differences in level of agreement are likely to be influenced by the difference between the counselor's and student's interpretation of the concept of each ingredient.

Since this study relies heavily on student self-report of session or course content, these findings have implications for the present study. Previous research examining psychotherapy session content and outcomes also found variable rates of agreement between counselor and client assessments of session content (Manthei, 2007). However, it was also noted that the level of therapist and client disagreement on session content assessments had no impact on the client's level of satisfaction with and outcomes from therapy (Manthei, 2007). It may be the case that client perception of session content and therapeutic relationship, in absence of therapist intention, is most crucial in client outcome. In general, process variables and client-therapist relationship has been under examined in career counseling scholarship (Brown & McPartland, 2005). We know that counselor-assisted interventions produce larger outcomes than entirely self-directed or computer-based interventions (Whiston, et. al., 2003), but the influence of the therapist and client alliance or process has not be fully explored. In this study, client self-report of session elements reflects the subjective interpretation of the client and is most important in understanding how they view counseling. Clients are free to interpret career counseling they see fit and this interpretation may be influenced by a number of factors, including relationship with the

therapist, psychological distress and/or demographic factors (Brown & McPartland, 2005). Future research is warranted to truly understand the dynamics of this phenomenon.

Research Question 1

The first goal of this study was to assess the outcomes of career counseling and career courses. It was hypothesized that participants would experience positive outcomes. This hypothesis was supported. Students in both conditions experienced positive results across all three domains of career intervention outcomes (psychological, role functioning and decision making). Among psychological outcomes, including career thoughts and satisfaction with intervention, participants reported moderate outcomes. At Time 3 students reported levels of negative career thoughts ($M = 51.03$, $SD = 27.77$) that were not significantly different from non-treatment normative samples ($M = 47.01$, $SD = 20.89$) (Sampson et al., 1996). However, since Time 1 data is unavailable, there is no way of determining any significant treatment effects on negative career thoughts. In relation to overall satisfaction, most participants reported that they found the experience helpful, with 99.2% of the respondents reporting that their intervention was at least "a little helpful." Among effective role functioning outcomes, 83.2% of the Time 3 participants identified at least one change that they had made over the semester in reference to their career, including declaring a major, applying to a job or internship or deciding on a career. Among decision making outcomes, students produced positive growth in all domains, including overall decision making (t[89] = -3.94, $p = .00$), planning (t[89] = -4.49, $p = .00$), self-appraisal (t[89] = -2.55, $p = .01$), goal selection (t[89] = -2.57, $p = .01$), occupational information (t[89] = -3.03, $p = .00$), and problem solving (t[89] = -3.00, $p = .01$)..

While participants demonstrated overall positive gains in all outcome domains, more modest gains were demonstrated in psychological variables. These data have demonstrated that

students do find the interventions helpful and they are experiencing a number of role functioning and decision making outcomes, but negative cognitions remained somewhat higher than expected. Further research is warranted to understand more about the progression of students negative thoughts about their career while in a career intervention. Other research studies have demonstrated overall decreases in negative career thoughts, while students participated in ac career intervention (Henderson, 2009). There may be a unique factor about participants in this study that contribute to these differences.

Research Question 2

It was originally hypothesized that career courses would produce the largest number and magnitude of outcomes. There is evidence that this hypothesis was refuted. Analyses found no significant treatment group differences among any of the outcome variables. However, due to the disproportionate numbers of participants in each condition, these results should be interpreted with extreme caution. The treatment findings do support earlier work by Ryan (1999), which found that while participants produced the largest gains in the initial few sessions, these gains lessened over time. Ryan (1999) concluded that interventions with 12 or more sessions, similar to the career course, produced effect sizes similar to one or two session interventions (e.g. short-term career counseling).

However, it should be noted that number of course participants compared to counseling was 5.09 times greater at time 2 and 4 times greater at time 3. Due to the inequities in sample size, the group comparison results found in this study are tenuous. A number of creative solutions were attempted to increase counseling student participation, however, none were successful. The response rate of counseling students was disappointing, but not completely surprising. Previous studies of online survey response have garnered Time 2 response rates of

19.8% (Sax, Gilmartin, & Bryant, 2003), which was similar to the counseling response rate of this study. Online surveys have become more popular means of data collection because of ease of use and cost-efficiency. However, this study demonstrates that novel ways of subject subject recruitment and/or incentive need to be developed to account for the difference in response rates when deciding to conduct a longitudinal online study. New methods of online survey participation incentives are being researched to help address this issue, including prepayment regardless of participation (Szelényi, Katalin, & Lindholm, 2005). As continued research is needed to address the differences in outcomes of career courses and career counseling, novel methods of incentive should also be explored, because in this investigation drawing alone was not successful.

There were some interesting findings in relation to group participation established by this investigation. Most importantly, it established initial the similarities between students who completed career counseling and those who took a career course. There has been speculation that career counseling and course populations may suffer from selection bias and the motivations and underlying characteristics of counseling students are different than course students (Brown & McPartland, 2005). This study established that at Time 1, there were no significant differences in decision making or psychological variables. In fact there seemed to be a great level of overlap between these interventions, where 9.3% of counseling participants had either taken the course or planned to take it in the future. In addition, 21.2% of course participants had or planned to engage in career counseling. It appears that initiation of career services participation provides the opportunity for students to take advantage of multiple services. These results reflect the institution's continued efforts to integrate these services and may not be

generalizable to other universities. However, it does reflect the general success of these efforts and potentially serves as a service model for other schools.

Research Question 3

The final HLM model of participant's career decision making self efficacy scores demonstrate that race, year in school, total critical ingredients experienced and time effect participant's scores. Time 1 career decision making self-efficacy scores (intercept) by race in order from highest to lowest are as follows: Latino, Multiracial, Black, White, and Asian. In addition, decision making self-efficacy increased with each school level, with graduate/professional students being highest, then seniors, juniors, sophomores and freshman. All participants' decision making self-efficacy scores increased over time and with more total critical ingredients experienced. Overall, for every critical ingredient that the participant experienced, their career decision making self-efficacy scores increased by 1.11 points.

Slope analyses revealed that there were statistically significant positive effects for both a random intercept and slope for total critical ingredients experienced. The significant random intercept indicates that the career decision making self-efficacy scores differ from participant to participant as a function of number of critical ingredients experienced. The significant positive random slope coefficient indicates that the as number of critical ingredients experienced increases, so does the person's career decision making self-efficacy scores, but the magnitude of this relationship differs from person to person. Interestingly, the estimated covariance between the random intercept and random slope was statistically significant, but negative. This indicates that the larger a person's intercept, the smaller the magnitude of the slope. The slope, while remaining positive, comes closer to zero the more critical ingredients a person experienced. This finding is common in many longitudinal studies, because the higher the value that the person

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begins with, the less growth they have to make (West, 2009). Since research on critical

ingredients is fairly new and the in vivo assessment of these elements are unique to this study,

there is little precedent upon which to compare these findings. It does support the findings of

Brown and Krane (2000), which indicated that more critical ingredients are associated with

higher outcomes. Thus, the third hypothesis was supported.

Limitations

In previous sections I discussed the most limiting factor in this study, which were the

sample size inequalities between counseling and course participants on Time 2 and Time 3.

Another methodological limitation of this study was the lack of a control group. This study

compared participants in two active treatment groups with no control group comparison. The

intent was to design a treatment study that assessed the differences between these two

interventions. Control group information may have been useful to assess the differences between

participants in career interventions and other college students, providing a basis upon which to

compare results. In addition, a control group may have provided further support to the

creditability of this project's results by supporting the efficacy of career services in general.

However, in the initial design phase of this study it was determined that controlled comparison

was not feasible. This study utilized a quasi-experimental design, as opposed to a randomized

one because I was interested in assessing the elements and outcomes of actual interventions, as

opposed to standardized simulated treatments. In addition, random assignment would have

eliminated the potential to study the effect of selection bias that was previous discussed. Control

groups usually imply random assignment to ensure quality of comparison, which was impossible.

However, even a non-random, non-treatment comparison group would have been difficult

because participation in the study could have been a non-face-to-face intervention. Simply

asking someone about their career decisions and difficulties is an intervention and could prompt comparison participants to seek career services. As it was not the goal of this study, to discourage students from seeking services, a comparison group, despite the potential benefits, was not pursued.

Implications for Career Services

The results of this paper have highlighted a number of potential areas of focus for career services. The most interesting findings were related to career decision making self-efficacy scores by race. This result contradicts previous deficit hypotheses that assume that people of ethnic and racial minorities have lower scores or more impairment across categories. It should be noted that there is little to no empirical basis for these assumptions. The relations between race and career intervention outcomes have been unsatisfactorily explored in empirical treatment literature (Brown & McPartland, 2005). In fact, many studies that have been used in foundational meta-analytical studies have failed to report the race of their participants, which means that these findings could not be aggregated across studies (Ryan, 1999).

In this study, people who were from Latino, Black and Multiracial backgrounds had somewhat higher (but not at a statistically significant level) confidence in their ability to successfully make career decisions. It is of note that students from Asian backgrounds had significantly lower confidence beliefs in their abilities to make career decisions. It is my hope that this study encourages treatment providers to pay attention to the cultural background and developmental stage of the client. This project demonstrated that these variables had influence on the outcomes students experienced. There have been previously published literature that focused on the various barriers and obstacles that people of color face when initiating career services (Carter, Scales, Juby, Collins, & Wan, 2003) and career service models for delivering

targeted services to people of minority groups, particularly African Americans and women. However, these findings suggest the possibility of developing further understanding of the strengths of individuals of these groups. In addition, this strengths-based approach could also be used to understand and assist Asian students in the career decision making process. This study also found that by Time 3 there were no significant racial differences in decision making self-efficacy scores, demonstrating that through intervention racial differences lessen.

Another important implication for this project is the development and use of the critical ingredients scale. This project supported previous research that found treatment effects increased with the number of critical ingredients (Brown & Ryan Krane, 2000; Brown, et al., 2003; Ryan, 1999). The concept of critical ingredients is important because it helps bridge the gap between research and career intervention practice. The critical ingredients scale is useful because it allows for the in vivo assessment of treatment elements. We know that critical ingredients, at least the first five, are related to higher treatment outcomes. The critical ingredients scale can be used both as an evaluation and treatment indicator. Career counselors and program administrators could use this scale to evaluate the elements and outcomes of the treatments they offer. Throughout psychological practice the impetus is on providing more evidence-based practice. The incorporation of critical ingredients can ensure that career counseling is also following this trend. In addition, the measure could also be used to assist in treatment planning and developing interventions. The logical progression would be to use critical ingredients to develop or improve services, which seems to be on the horizon (see Henderson, 2009 for an example).

Summary and Conclusions

This project has provided information about the elements and outcomes of career interventions. The present findings have reinforced previous research that examines the effect of person-level variables have on treatment response. While career intervention providers can be assured that students do benefit from both career counseling and career courses, more attention should be paid to developmental or background influences on career intervention outcomes. In addition, the present study outlined potential treatment and research implications for the findings presented.

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Appendix A

Demographic Questionnaire

Directions. Please tell us about yourself by completing the following information.

1. Age: _____

2. Gender:
    a. Male
    b. Female

3. In terms of racial or pan-ethnic group, I consider myself to be (click all that apply):
    a. Asian/Asian American
    b. Black/African American
    c. Latino/Hispanic
    d. Native American/American Indian
    e. White
    f. Bi-racial or Multiracial (please specify: _____)
    g. Other racial or pan-ethnic group(s) (please specify: _____)

4. What is your primary ethnic background? (e.g., African American, Filipino, Chinese, French, Mexican American, Italian, Haitian, English, Cuban, Turkish, Jewish, etc)

    _____

5. What year are you in school?
    a. First year (freshman)
    b. Sophomore
    c. Junior
    d. Senior
    e. Graduate/professional student

6. What was your reason for enrolling in Career Exploration (making an appointment with a career counselor)?
    a. Finding a major
    b. Figuring out a career direction
    c. Finding a summer job or internship
    d. Finding a job after graduation
    e. This class has a reputation of being easy
    f. It was specifically required
    g. Other (please specify)_____

7. So far, how would you describe your experience with the Career Exploration course (the Career Center) ?
    a. Not at all helpful

b. A little helpful
c. Somewhat helpful
d. Very helpful
e. Extremely helpful

8. Have you taken a Strong Interest Inventory?
    a. Yes
    b. No
    c. I am not sure

9. How many sessions have you had with a career counselor at the Career Center?
    a. None
    b. 1
    c. 2
    d. 3
    e. 4
    f. 5 or more

10. What occupation do you intend to enter when you leave school? List below the occupations you have considered in thinking about your future. List the careers you have daydreamed about as well as those you have discussed with others. Try to give a history of your tentative choices and daydreams. Put your most recent job choice on Line 1 and work backwards to the earlier jobs you have considered. (please describe job activity if you are unsure of the job title)
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____
    f. _____
    g. _____
    h. _____

11. What is your major (or intended major), if undecided please write "undecided"
    _____

12. Please identify a code number (or password) known only to you, that could be used to classify your responses. Please make this code number something that is easy to remember. Please do not use your email address or name.
    _____

Critical Ingredients Scale

Read each definition carefully and determine if your career counseling session and assignments

used these activities and materials. Check yes if your appointment(s) did include that material,

check no if it did not.

Name	Definition	YES	NO
Workbooks and written exercises	I used workbooks, logs, or other written material that required me to write my goals, future plans, occupational analyses, etc.		
Individualized interpretations and feedback	I received individualized feedback on test results, goals, future plans, or assignments.		
World of work information	I received information about the world of work and specific career options.		
Modeling	I was exposed to models of career exploration, decision-making, vocational interests, career implementations, or other related models.		
Attention to building support	I received information on how to build support for my career choices and plans.		
Computer-guided assistance	I was asked to complete an assessment, activity, research or assignment using the computer.		
Self-report inventories	I completed an inventory to learn more about myself (i.e., interests, needs, skills, abilities, personality).		
Counselor support	I felt supported by my counselor.		
Cognitive restructuring	I was challenged to confront some of my assumptions and beliefs.		
Vocational exploration	I was encouraged to explore and research different occupations or opportunities on my own.		
Values clarification	We discussed my personal values/needs and how they relate to career choice.		
Card sort procedures	I used a card-sort to help arrive at a career choice or gain clarity about		

	things that are important to me.		
Decision-making models and strategies	We discussed the decision-making process (how people make decisions), the steps to making a good decision, and factors involved in decision-making.		
Outside reading	Outside reading assignments were given to help me learn more about career development models and strategies.		
Personal performance accomplishments	I practiced making career decisions or choices (e.g. simulations and role play activities).		
Anxiety reduction	I discussed ways to reduce or manage my anxiety over my current and future career-related activities.		
Vicarious achievements	I discussed times when I was successful in making decisions or achieving goals.		
Attention to decreasing barriers	I discussed and identified career related barriers.		