THE RELATIONSHIP OF COUNSELOR EDUCATION PROGRAM APPLICANTS’ COGNITIVE COMPLEXITY TO OTHER ADMISSION CRITERIA

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Counselor cognitive complexity is a counselor’s ability to recognize and organize multiple characteristics that might affect client needs. I examined whether various admissions criteria—Graduate Record Examination (GRE) Verbal, Quantitative, and Analytical Writing scores; previous coursework grade point averages; and faculty co-leaders’ admissions group interview ratings—for 182 applicants to a southwestern U.S. CACREP-accredited master’s counseling program predicted cognitive complexity scores on a modified Counselor Cognitions Questionnaire (CCQ). Participants were predominantly ages 20 to 30 years (91.8%), female (91.8%), and White (81.3%).

Multiple regression analyses showed statistical significance with small effect sizes: the admissions criteria together significantly predicted cognitive complexity differentiation ($p = .033$), accounting for 6.6% of variance, and cognitive complexity integration ($p = .003$), accounting for 9.8% of variance. The small effect sizes and low variance percentages support the idea that cognitive complexity measured by the modified CCQ is a substantially different phenomenon from commonly-assessed academic aptitude and personality characteristics. If future researchers confirm these findings with additional samples, subsequent researchers could determine whether one or both domains of cognitive complexity, either alone or in combination with one or more of the commonly used admissions criteria, could help counselor educators better predict which applicants will be successful in master’s programs and the counseling field.
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THE RELATIONSHIP OF COUNSELOR EDUCATION PROGRAM APPLICANTS’ COGNITIVE COMPLEXITY TO OTHER ADMISSION CRITERIA

Introduction

The selection of students to enter a counseling program is a complicated process (Wheeler, 2000). Counselor educators have been investigating and writing about the admissions process for decades (Markert & Monke, 1990). Some of these scholars have called for standards in screening applicants (Pope, 1996; Smith, 2004), and others have endorsed multiple screening criteria (Markert & Monke, 1990; Holden, Roberts, & Brookshire, 1999). Still others have recommended alternative measures that assess different forms of intelligence and noncognitive variables when selecting students for higher education (Sedlacek, 2003). Most counselor educators have indicated that selecting students to become helpers in the mental health field involves more than assessment of academic ability (Leverett-Main, 2004; Smady, Maddux, Richmond, Lepkowski, & Packman, 2005; Smith, 2004). Counselor educators are also looking for personal qualities in applicants that seem necessary for success in the counseling field (Halinski, 2009; Pope, 1996; Smith, 2004). Some authors have even proposed that these personal qualities are inherent and cannot be taught, so admissions committees may need to assess for these characteristics or qualities before counselor education begins (Osipow & Walsh, 1973; Pope, 1996; Wheeler, 2002).

The stakes are high for counseling program faculties to select applicants with potential to succeed in the program and profession (Kuncel, Hezlett, & Ones, 2001); in particular, dismissing poor-performing students late in a master’s program involves not only substantial financial loss to students but emotional and time costs to both students
and faculty (McAdams, Foster, & Ward, 2007). Although investigators have searched for the best predictors of academic and clinical success in counseling programs, the admissions screening process for counseling students is imperfect (Alston, Holbert, & Goodwin, 1999). Indeed, it may be the complex nature of the prerequisites necessary to be an effective counselor will always be somewhat of a mystery beyond quantitative measure (Halinski, 2009). Still, counselor educators have a responsibility to attempt to choose the best candidates possible to enter into the profession (Bradley & Post, 1991) by searching for valid measures by which to choose candidates for entrance into counseling programs. The responsibility of choosing students who will be successful in programs and as counseling professionals affects counseling programs, students, faculty, and most importantly, the public that counseling professionals serve (McAdams et al., 2007).

Academic Admissions Criteria

Tradition seems to be the guiding force in the screening of applicants for graduate level study in counseling programs (Pope, 1996). Though many counselors have written about limitations of traditional methods of choosing students (Alston et al., 1999; Cantwell, 1990; Holden et al., 1999; Hosford, Johnson, & Atkinson, 1984; Leverett-Main, 2004; Markert & Monke, 1990; Smaby et al., 2005; Wheeler, 2000), admissions committees continue to rely on academic criteria as the primary selection factors (Fauber, 2006; Schweiger, Henderson, McCaskill, Clawson, & Collins, 2012). Researchers have come to conflicting conclusions concerning the use of academic criteria as prediction factors for graduate school success. Camp and Clawson
(1979) concluded Graduate Record Examination (GRE) scores were not useful predictors of counseling program achievement even though they found significant positive correlations between GRE scores and graduate grade point average (GGPA). They argued the correlations, though significant, were too small and accounted for limited variance in outcome measures. Goldberg and Alliger (1992) found that specific academic criteria were predictive of various outcome measures of counseling education but were wary about their utility in predicting overall graduate school success. Morrison and Morrison (1995) found nonsignificant correlations between GRE scores and GGPA. Halinski (2009), unlike the authors above, concluded the analytical writing portion of the GRE (GRE-AW) to be useful and predictive of counseling basic skills mastery as assessed by instructors.

A review of studies in which researchers investigated both undergraduate grade point average (UGPA) and GRE scores as predictors of success in counseling programs revealed that, again, conclusions differed. Hosford et al. (1984) found these academic criteria to be predictive of academic success but not clinical success. Morrow (1993) found GRE scores and UGPA to be significantly correlated to GGPA with the GRE analytical (GRE-A) score having the strongest correlation. Alston et al. (1995) did not find correlations between standardized test scores and UGPA with GGPA. However, examining those criteria with other non-academic measures produced correlations with overall rehabilitation counseling program success. Kuncel et al. (2001) concluded that utilizing UGPA and GRE scores together would give the best prediction of graduate program performance assessed by GGPA, faculty ratings, and research production. Smaby et al. (2005) found academic criteria to be predictive of academic success and,
to an extent, clinical success in a counseling program. They did not find that academic
criteria could predict personal development. Schmidt, Homeyer, and Walker (2009)
found GRE-V and GRE-Q scores and, to a lesser extent, UGPA to be predictors of
comprehensive knowledge at the end of a counseling education program.

The results of the studies seem to point toward academic admissions criteria
being better predictors of academic success rather than clinical success in counseling
programs, although there is some evidence for the latter relationship (Smaby et al.,
2005). Because of small, though significant, relationships found between academic
admissions variables and graduate program success, authors have concluded
academic criteria should be utilized with other admissions variables to select students
for entrance into graduate programs (Kuncel & Hezlett, 2007).

Non-Academic Admissions Criteria

Because the selection of individuals seeking to enter counseling preparation
programs is complex (Alston et al., 1999; Pope, 1996; Wheeler, 2000), additional
measures for assessing non-cognitive traits seem necessary (Hosford et al., 1984;
Smith, 2004). Investigators have pointed to the interview as a complement to cognitive
assessments of interviewees (Campion, Palmer, & Campion, 1997). Nagpal and Ritchie
(2002) found that counselor educators looked for characteristics under three themes
when interviewing students for entrance into counseling programs: professional
attributes, personal attributes, and interpersonal skills. Helmes and Pachana (2008)
found that Australian psychological training program clinical directors used interviews to
assess applicants for empathy, interpersonal skills, flexibility, and sensitivity to diversity.
Though investigators of the interview process have found validity for its use in assessing personality (Barrick, Patton, & Haugland, 2000) and that increasing interview structure tends to improve psychometric properties of the interview (Campion et al., 1997), scholars who have studied the selection interview in counseling and psychology programs have come to different conclusions about its necessity and utility. Hosford et al. (1984) found no relationship between the interview and counseling program success. Rickard and Clements (1986) said there were no significant differences in faculty ratings of interviewed and non-interviewed students, but they failed to explain in what manner the interview was used to select students. Alston et al. (1999), Holden et al. (1999), and Halinski (2009) did find scores garnered from the interview process were correlated with counseling program success, specifically in clinical courses. Thus, the research points to the premise that the interview may be useful as one criterion in the selection of counseling program students. Investigators need to continue research in this area for more conclusive evidence and improvement of the interview process.

Cognitive Complexity

One construct that holds potential as a possible criterion for counseling student selection is cognitive complexity. Researchers have looked at the idea of cognitive complexity as a measureable quality that has potential in predicting effective counseling skills (Goldberg, 1974). The idea of cognitive complexity has to do with how one differentiates, evaluates, and integrates information (Crockett, 1965). Welfare and Borders (2007) defined cognitive complexity differentiation as the number of constructs counselors have in their cognitive systems to describe and understand people with
whom they work. Crockett (1965) defined integration in a cognitive system as how a person relates distinct constructs and hierarchically organizes them. Blocher (1983) stated that a counselor needed to be able to distinguish between many pieces of information and integrate relevant data into working hypotheses about clients and their lives. As a person’s ability to perceive others increases in complexity, stereotyping decreases and the ability to integrate foreign, novel information about others becomes easier. To an extent, cognitive complexity may help to distinguish potential candidates who are better suited to enter into programs to become counselors because it has been linked to positive counseling attributes (Blocher, 1983; Holloway & Wampold, 1986; Smaby et al., 2005).

Crockett (1965) explained that cognitive complexity was dependent on one’s experiences. He theorized if one had more experience in an area of life, one was likely to have formulated constructs and relationships among constructs in that area of life. In contrast, he postulated an individual with few experiences in an area of life would have constructs that are less differentiated and less organized (integrated) in that particular area. Crockett said that cognitive complexity was domain-specific depending on what type of experiences one had encountered.

Researchers interested in cognitive complexity and counseling have focused on two broad areas of study. First, counselor educators have investigated development of student cognitive complexity throughout counseling programs (Brendel, Kolbert, & Foster, 2002; Duys & Hedstrom, 2000; Fong, Borders, Ethington, & Pitts, 1997; Little, Packman, Smaby, & Maddux, 2005). Educators have asked if, and to what extent, cognitive complexity can develop while a student is in a counseling program. Second,
investigators have studied whether increased counselor cognitive complexity is related to better counseling skills (Benack, 1988; Borders, 1989; Borders, Fong, & Neimeyer, 1986; Goldberg, 1974; Holloway & Wampold, 1986; Holloway & Wolleat, 1980; Ladany, Marotta, & Muse-Burke, 2001; Lovell, 1999; McAuliffe & Lovell, 2006; Spengler & Strohmer, 1994).

The research points to cognitive complexity as a trait that can develop when students are progressing through counseling programs, although investigators have observed most growth after experiential class work (Brendel et al., 2002, Duys & Hedstrom, 2000; Granello, 2002; Little et al., 2005). Investigators have also found correlations between cognitive complexity and skills and attributes beneficial to counseling. Specifically, individuals at higher levels of cognitive complexity were able to ask more questions (Holloway & Wolleat, 1980) and formulate different, complex hypotheses (Holloway & Wolleat, 1980; Ladany et al., 2001; Spengler & Strohmer, 1994) about client presentations. They appeared more able to remain objective during sessions without being overly critical of clients (Borders, 1989). Additionally, they seemed to understand inner experiences and communicate this understanding better to clients (Benack, 1988; Goldberg, 1974; McAuliffe & Lovell, 2006). Their responses to client cues displayed more thought and reasoning and went to a deeper level (Benack, 1988; McAuliffe & Lovell, 2006), and they seemed to be more aware of the relational aspect of counseling and their part in it (Borders et al., 1986). Their high cognitive complexity allowed for increased empathy (Benack, 1988; Lovell, 1999). Finally, they seemed to be more at ease with ambiguity and led their clients to look at different alternatives for themselves (McAuliffe & Lovell, 2006).
Purpose of the Study

Counselor educators are searching for applicants who will succeed academically and have relationship-building and other clinical skills to be effective in the counseling field (Council for Accreditation of Counseling and Related Educational Programs [CACREP], 2009). Although counselor educators have studied the admissions process and have tried to use criteria predictive of success in counseling programs (Alston et al., 1999; Hosford et al., 1984; Smaby et al., 2005), they have found conflicting data as to which criteria are useful. Some have called for multiple screening measures to assess academic and personal characteristics of applicants (Holden et al., 1999). Counselor educators still have not reached consensus regarding what works in predicting counseling program and field success. In 1984, Hosford et al. noted that additional research is necessary to discern the most effective criteria for selecting applicants for counselor education programs….it may not be possible to use the same set of criteria to select students who are both strong academicians and competent counselors. (p. 274)

As recently as 2007, Kuncel and Hezlett continued to state that research is still needed to determine more reliable measures of non-academic qualities that can be used in admitting students into graduate programs. Because research into admissions criteria for counseling study continues to be warranted, the purpose of this study was to investigate counselor cognitive complexity and its relationship to other common admissions variables. Establishment of cognitive complexity as a phenomenon related to or different from other admissions criteria is the first step in investigating whether it might enhance prediction of applicants’ success in counselor education programs, either instead of or in combination with those other criteria.
For this study, I posed one question: To what degree do common admissions criteria (previous academic coursework GPA, GRE scores, and admissions group interview ratings) predict counseling program applicants’ cognitive complexity scores of differentiation and integration as measured by the Counselor Cognitions Questionnaire (CCQ; Welfare, 2007)? My assumption for this study was that cognitive complexity was related to academic aptitude as measured by previous academic coursework GPA and GRE scores and traits assessed during group interviews; therefore, admissions criteria commonly used to assess applicants would predict differentiation and integration scores of the CCQ.

Methods

Participants

I recruited participants for this study from applicants to a CACREP-accredited master’s in counseling program in the southwestern United States. The counseling program informed the applicants that research was being conducted on the admissions process and that all applicants with a completed application packet were being invited to an Orientation and Interviews. The counseling program also provided applicants with their quartile ranking (top quartile, 2nd quartile, 3rd quartile, or bottom quartile) based upon academic criteria so that applicants could make an informed decision about attending the Orientation and Interviews. The program informed applicants that because a larger number of applicants were being invited to the Orientation and Interviews, a smaller percentage of those attending would be accepted. I collected data for this study in two consecutive Orientation and Interview rounds: Fall 2012 and Spring 2013.
In Fall 2012, the counseling program had 68 applicants; three indicated they would submit a DVD in lieu of attending the in-person group interviews, and of the remaining 65 invited to the interviews, 64 attended. In Spring 2013, the counseling program had 173 applicants; 10 indicated they would submit a DVD, and of the remaining 163 applicants invited to the interviews, 131 attended. I asked all applicants who were present at the Orientation and Interviews to participate in this study. The final number of attendees at both orientations was 195. Some attendees chose not to participate in the study, some participated but did not write their packet number next to their name on the orientation sign-in sheet, and a few attendees at the second Orientation and Interviews were reapplying after having been denied admission in the Fall and, as such, had already participated in the study.

The final number of completed assessments matched with applicant admission criteria and demographic information used for this study was 182, of which 167 participants (91.8%) were female, and 15 (8.2%) were male. The participants included 148 (81.3%) individuals identifying themselves as White, 11 (6%) as Asian, 11 (6%) as Hispanic, 10 (5.5%) as African-American, one (0.5%) as Indian, and one (0.5%) as biracial. Participants ranged in age from 20 to 52 with a mean of 25 years and a mode \( (n = 60) \) of 22 years. One hundred thirty four (73.6%) applicants were between the ages of 20 and 25. Thirty-three (18.1%) of the applicants were between the ages of 26 and 30. Ten (5.5%) of the applicants were between the ages of 31 and 40. Five (2.7%) of the applicants were older than 40.
Instruments

Graduate Record Examination (GRE). The GRE revised General Test was introduced in August 2011 and has three sections: verbal (GRE-V), quantitative (GRE-Q), and analytical writing (GRE-AW). Educational Testing Service (ETS) stated the test measures verbal and quantitative reasoning, analytical writing, and critical thinking skills that are closely aligned with skills necessary to be successful in a variety of graduate programs. Three scores are reported when a person takes the GRE revised General Test. GRE-V and GRE-Q scores are reported on a 130-170 score scale in one point increments (Educational Testing Service, 2012b). Because ETS introduced the revised version of the general test in 2011, some applicants had taken an earlier version of the GRE. I used the concordance tables provided by ETS (Educational Testing Service, 2012a) to compare the different scale scores of the GRE-V test and GRE-Q test in the two versions of the assessment. The GRE-AW score is reported on a 0-6 point scale in half point increments (Educational Testing Service, 2012b).

Investigators have studied the GRE standardized test extensively and have found it to be a valid measure of graduate school academic performance (Kuncel & Hezlett, 2007). Researchers have found corrected meta-analytic estimates ranging from .41 to .59 for the GRE predicting first year graduate student grades in a variety of disciplines (Kuncel, Wee, Serafin & Hezlett, 2010). ETS estimated the reliability of the GRE-V test at .93, of the GRE-Q test at .94, and the GRE-AW test at .79. ETS stated the reliability estimates for the GRE-V and GRE-Q test are based on item response theory. ETS has recommended that GRE scores be used with other criteria in the
selection of students for graduate level education; the scores should not be used as the sole criterion for admissions (Educational Testing Service, 2012a).

**Converted Previous Coursework GPA**

The counseling program converts previous coursework GPAs into rating scores from 1 to 10. Because some applicants have last-60-hours of undergraduate coursework GPAs, others have total undergraduate GPAs, and still others have completed some master’s level work, the counseling program has devised a way to convert scores to a common rating system based upon what the graduate school sends for each applicant. The conversion table is below. In this study, I used the converted GPA rating as the independent variable in the statistical analyses.

Table 1

*Previous Academic Coursework Conversion Table*

<table>
<thead>
<tr>
<th>Rating</th>
<th>Total UGPA</th>
<th>Last 60 UGPA</th>
<th>Master’s GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>≤ 2.79</td>
<td>≤ 2.99</td>
<td>≤ 3.49</td>
</tr>
<tr>
<td>1</td>
<td>2.80 – 2.91</td>
<td>3.00 – 3.09</td>
<td>3.50 – 3.54</td>
</tr>
<tr>
<td>2</td>
<td>2.92 – 3.03</td>
<td>3.10 – 3.19</td>
<td>3.55 – 3.59</td>
</tr>
<tr>
<td>3</td>
<td>3.04 – 3.15</td>
<td>3.20 – 3.29</td>
<td>3.60 – 3.64</td>
</tr>
<tr>
<td>4</td>
<td>3.16 – 3.27</td>
<td>3.30 – 3.39</td>
<td>3.65 – 3.69</td>
</tr>
<tr>
<td>5</td>
<td>3.28 – 3.39</td>
<td>3.40 – 3.49</td>
<td>3.70 – 3.74</td>
</tr>
<tr>
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<td>3.40 – 3.51</td>
<td>3.50 – 3.59</td>
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<td>3.60 – 3.69</td>
<td>3.80 – 3.84</td>
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<td>8</td>
<td>3.64 – 3.75</td>
<td>3.70 – 3.79</td>
<td>3.85 – 3.89</td>
</tr>
<tr>
<td>9</td>
<td>3.76 – 3.89</td>
<td>3.80 – 3.89</td>
<td>3.90 – 3.94</td>
</tr>
<tr>
<td>10</td>
<td>3.90 – 4.0</td>
<td>3.90 – 4.0</td>
<td>3.95 – 4.0</td>
</tr>
</tbody>
</table>

*Group Interview Faculty Leader Rating*

Each interview group consisted of 8-10 applicants, and the co-leaders for each interview group consisted of one faculty member and one doctoral student. During the group interview, co-leaders guided applicants through a series of semi-structured
activities including group member introductions, a values identification and consensus activity, a discussion concerning desirable and undesirable counselor characteristics, and a strength bombardment activity. At the end of the approximately 2.5 hour group interview, co-leaders asked applicants to confidentially rate themselves and each member of their group from extremely poor (1) to extremely good (5) in six areas: effectiveness of expression, understanding of others, genuineness, caring, respect for diversity, and overall potential as an effective counselor. Co-leaders also rated applicants in the same manner (University of North Texas Counseling Program, n.d.). Each participant’s group interview faculty leader rating was the average score of the six ratings the faculty co-leader gave the participant.

To establish group leader inter-rater reliability, I developed a mock applicant training video that all faculty group co-leaders watched. In the video, I had three mock applicants introduce themselves and describe their reasons for wanting to enter the counseling program. In the final portion of the video, I recorded the three mock applicants participating in the group consensus task of the group interview process.

I designed the scripts for the three mock applicants to be distinctive: one applicant was meant to be high-scoring, one applicant was meant to be mid-scoring, and one applicant was meant to be low-scoring. I asked all faculty group co-leaders to watch the training video and rate each applicant’s potential to become an effective counselor on a 5 point Likert scale: 1 = extremely poor, 2 = poor, 3 = fair, 4 = good, and 5 = extremely good.

I calculated an average measures intraclass correlation coefficient of 0.99 for all group leaders who watched the video. In order to prevent drifting in applicant ratings
from Fall group interviews to Spring group interviews, I asked faculty group co-leaders who had led interview groups in the Fall to re-watch the mock applicants video in the Spring, and I provided them with the average rating for each applicant and asked that they keep the ratings in mind as they re-watched the video.

*Counselor Cognitions Questionnaire*

To assess cognitive complexity, I used an modified version of the Counselor Cognitions Questionnaire (CCQ; Welfare, 2007). The CCQ measures how one conceptualizes clients and is an assessment of cognitive complexity in the counseling domain. Welfare and Borders (2010a) based the CCQ in personal construct theory. They improved on previous cognitive complexity measures by making this instrument specific for counselors and also adding assessment of cognitive complexity integration.

For the CCQ, respondents describe two clients: one whom they believe they were effective in helping with a problem and a second whom they believe they were less effective in helping with a problem. Respondents are asked to describe these clients as completely as possible by writing down all characteristics of each client in two separate grids. Respondents are then asked to label each characteristic written down as positive, negative, or neutral. For each client described, respondents are next asked to group the descriptive characteristics into categories (Welfare, 2007).

Because participants in my study were not yet counselors or even counseling students, I obtained permission from Welfare to modify the CCQ minimally to make it appropriate for applicants to a counseling program. Instead of asking participants to describe two clients, I asked participants to describe two people (L. E. Welfare, personal
communication, June 18, 2012). The CCQ can be administered in a group or individually and requires 15 minutes for completion (Welfare & Borders, 2007).

I and a doctoral level co-rater used a detailed scoring protocol to quantify cognitive complexity differentiation and cognitive complexity integration. Differentiation refers to the extent of available pieces of information one has in a cognitive system. Integration refers to one’s ability to integrate and organize those pieces of information in order to use them. To formulate a differentiation score, raters count the number of descriptors respondents write down for each person on the CCQ. Raters sum the number of distinct characteristics written down for both persons described and subtract the number of shared characteristics listed between the two people (Welfare & Borders, 2007).

To formulate an integration score, scorers give sub-scores for a balance or imbalance of positive and negative descriptors as well as the number of types of descriptors respondents use to describe each person. Welfare and Borders (2007) specified five types of client descriptions: cognitive, spiritual, emotional, contextual, and behavioral. Additionally, scorers assess the respondents’ recognition of the helping relationship in the descriptions (“relates well to me”) and give points for including that in the descriptions. Scorers then count the number of categories that respondents develop for the descriptors and look for categories that reflect awareness of the helping relationship (“biases I may have about this person”). To finalize the integration score, scorers sum these subscores and subtract, if necessary, the number of shared categories between the two persons described.
Welfare and Borders (2010b) reported a positive correlation between CCQ integration and differentiation scores ($r = .64, p < .01$) in the final phase of instrument development using a convenience sample of 120 master’s and post-master’s participants. They claimed this relationship as evidence for the validity of having two scores to represent cognitive complexity: one for differentiation and a second for integration. Additionally the authors found statistically significant differences in differentiation ($F = 23.7, p < .01$) and integration ($F = 14.49, p < .01$) scores of master’s and post-master’s level participants. Welfare and Borders claimed this result served as evidence that the CCQ discriminates between beginning level counselors and practitioners who have more experience.

The authors did not find a statistically significant difference in differentiation scores ($F = 1.075, p > .10$) among the counseling specialties of college, school, family, and mental health counseling. However, they did find a statistically significant difference in integration scores among specialties ($F = 2.78, p < .05$). Upon further analysis, the authors found participants who identified themselves as mental health practitioners scored significantly higher on CCQ integration than participants who identified themselves as school counselors. The authors looked more closely at the data and found a higher number of post-master’s participants who were mental health counseling practitioners. They stated this difference in sizes of comparison groups might have confounded the results (Welfare & Borders, 2010b).

Welfare and Borders (2010b) reported the Pearson product-moment correlation between the CCQ differentiation total and Sentence Completion Test total as .14 ($p > .10$) and between the CCQ integration total and Sentence Completion Test total as .16
(p > .05). The authors said these nonsignificant correlations indicated the CCQ measured something different than general cognitive complexity: domain-specific counselor cognitions about clients. Welfare and Borders (2010b) reported inter-rater reliabilities of .99 and .96 for differentiation and integration totals, respectively, of the 120 scored assessments. They stated that inter-rater reliabilities of .90 or above are acceptable for the CCQ (Welfare & Borders, 2007).

Procedures

I asked the applicants attending the counseling program Orientation and Interviews to participate in this study. As the applicants arrived to the room where the orientation was being conducted, I gave them each a research packet containing two informed consent forms and the cognitive complexity assessment (modified CCQ). I reviewed the informed consent forms with the applicants and emphasized to them that neither their participation nor their scores on the cognitive complexity assessment would have any bearing on the decision by the Master's Admissions Committee concerning which applicants would be admitted to the program. I used a coding procedure to isolate applicants’ scores from their identities.

Applicants who agreed to participate in the study completed the modified CCQ and returned the research packet to me containing a signed informed consent form and the completed cognitive complexity assessment instrument. The orientation facilitator took the sheet with the names of the applicants and the number of the research packet each one had used.
I asked a doctoral level counseling practitioner familiar with counseling program admissions and research to help me score the cognitive complexity assessments. After scoring the CCQs individually, I calculated a Pearson correlation coefficient for our differentiation and integration scores to assess inter-rater reliability. For the data collected in the Fall 2012, \( r = .97 \) for differentiation scores and \( r = .86 \) for integration scores \((n = 62)\). For the data collected in the Spring 2013, \( r = .96 \) for differentiation scores and \( r = .87 \) for integration scores \((n = 124)\). The doctoral level rater and I reviewed each assessment on which our scores differed and came to a consensus score for final data analysis.

Once I and my co-rater had individually scored the modified CCQs and had come to consensus on discrepant scores through conference, I gave the scores to a counseling program administrative assistant. The counseling program administrative assistant matched the differentiation and integration scores to the names of the applicants based on the list containing each applicant’s name and research packet number. The counseling program administrative assistant then added the other information (GRE scores, converted GPAs, and group interview faculty leader ratings) to a spreadsheet with the assessment numbers and cognitive complexity scores. The applicant names were excluded to protect participants’ confidentiality. I then ran analyses on the compiled data.

Data Analysis

I used SPSS software to perform two multiple regression analyses using converted GPAs, GRE scores, and group interview faculty leader ratings as predictor
variables on the dependent variables of cognitive complexity differentiation and cognitive complexity integration. Multiple regression analyses enabled me to see how well the independent variables related to and predicted cognitive complexity scores of differentiation and integration (Pallant, 2010).

Results

I examined the admissions variables and cognitive complexity scores of 182 participants for this study. One participant’s previous academic coursework GPA was unavailable at the time of data analysis. Table 2 shows the ranges, means, and standard deviations for all predictor variables and dependent variables in the multiple regressions.

Table 2

Descriptive Statistics (Ranges, Means, Standard Deviations) for all Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRE-V</td>
<td>182</td>
<td>134.00</td>
<td>164.00</td>
<td>151.03</td>
<td>5.76</td>
</tr>
<tr>
<td>GRE-Q</td>
<td>182</td>
<td>132.00</td>
<td>168.00</td>
<td>147.70</td>
<td>6.12</td>
</tr>
<tr>
<td>GRE-AW</td>
<td>182</td>
<td>2.00</td>
<td>5.50</td>
<td>3.84</td>
<td>0.68</td>
</tr>
<tr>
<td>GPA</td>
<td>181</td>
<td>0.00</td>
<td>10.00</td>
<td>5.69</td>
<td>3.10</td>
</tr>
<tr>
<td>Interview</td>
<td>182</td>
<td>2.50</td>
<td>5.00</td>
<td>4.45</td>
<td>0.50</td>
</tr>
<tr>
<td>Differentiation</td>
<td>182</td>
<td>9.00</td>
<td>41.00</td>
<td>19.85</td>
<td>5.74</td>
</tr>
<tr>
<td>Integration</td>
<td>182</td>
<td>5.00</td>
<td>19.00</td>
<td>10.47</td>
<td>2.71</td>
</tr>
</tbody>
</table>

Regression analysis revealed the model did significantly predict differentiation scores, $F(5,175) = 2.483$, $p = .033$. $R^2$ for the model was .066, and adjusted $R^2$ was .040. For a multiple correlation analysis, Cohen (1988) defined a small effect size as $R^2 = .019$ and a medium effect size as $R^2 = .13$. Therefore, the effect size for this model is small. Table 3 shows a summary of regression coefficients. In terms of individual
relationships between the predictor variables and differentiation scores, GRE-V ($t = -0.112, p = .911$), GRE-Q ($t = -0.021, p = .983$), GRE-AW ($t = 2.589, p = .010$), converted GPA ($t = 0.271, p = .787$), and group interview faculty leader rating ($t = 1.563, p = .120$), only the independent variable of GRE-AW made a significant unique contribution to predicted modified CCQ differentiation.

A second regression analysis revealed the model did significantly predict integration scores, $F(5,175) = 3.789, p = .003$. $R^2$ for the model was .098, and adjusted $R^2$ was .072. Applying Cohen's (1988) effect size criteria, .098 represents a small effect. Table 3 shows a summary of regression coefficients. In terms of individual relationships between the predictor variables and integration scores, GRE-V ($t = 0.386, p = .700$), GRE-Q ($t = 1.368, p = .173$), GRE-AW ($t = 1.642, p = .102$), converted GPA ($t = 1.194, p = .234$), and group interview faculty leader rating ($t = 1.173, p = .242$), no independent variable made a significantly unique contribution in predicting modified CCQ integration scores.

Table 3

<table>
<thead>
<tr>
<th>Variable</th>
<th>Constant</th>
<th>Coefficient</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>SEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differentiation</td>
<td>8.586</td>
<td>-0.011</td>
<td>-0.011</td>
<td>0.066*</td>
<td>0.040*</td>
<td>5.62</td>
</tr>
<tr>
<td>GRE-V</td>
<td>-0.002</td>
<td>-0.002</td>
<td>-0.002*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRE-Q</td>
<td>1.821</td>
<td>0.216*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRE-AW</td>
<td>0.039</td>
<td>0.021</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td>1.351</td>
<td>0.118</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interview</td>
<td>-5.285</td>
<td></td>
<td></td>
<td>0.098**</td>
<td>0.072**</td>
<td>2.61</td>
</tr>
<tr>
<td>Integration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRE-V</td>
<td>0.018</td>
<td>0.038</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRE-Q</td>
<td>0.057</td>
<td>0.129</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRE-AW</td>
<td>0.536</td>
<td>0.135</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td>0.080</td>
<td>0.092</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interview</td>
<td>0.470</td>
<td>0.087</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05. ** p < .01.
Discussion

My assumption for this study was that cognitive complexity was related to other variables being used to select students for entrance into counseling programs; therefore, regression analyses using common admissions criteria (GRE scores, converted GPAs, and interview ratings) as independent variables would predict modified CCQ dependent variables of cognitive complexity differentiation and cognitive complexity integration. I found admissions criteria commonly used to assess applicants, as a whole, were statistically significant in predicting cognitive complexity scores.

However, regression results also revealed that admission criteria accounted for only 6.6% of variance in cognitive complexity differentiation scores and 9.8% of variance in cognitive complexity integration scores – findings that corresponded to the small effect size results. Therefore, although the results were statistically significant, their practical significance indicated that GRE scores, converted GPAs, and group interview faculty leader ratings were only minimally predictive of cognitive complexity. This finding supports the idea that the cognitive complexity instrument used in this study measures a phenomenon substantially different from academic aptitude, as measured by GRE scores and GPAs, and personality characteristics, as assessed by group interview ratings.

Limitations

The participants in this study were applicants to one counseling program in the southwestern United States. Additionally, participants were predominantly female, under the age of 25, and White. Although this demographic may fairly well represent
counseling applicants nationally, these factors, nevertheless, limit the generalizability of conclusions that can be drawn from this study (J. Holden, personal communication, June 19, 2013).

The group interview faculty leader rating needs further research and validation. The group co-leaders do receive the same instructions for leading the group interviews; however, there are differences among co-leaders in how the groups are facilitated. Additionally, how interviewees are rated differs among co-leaders and participants. One rater may rank generously and another may rank more reservedly. Although faculty co-leader inter-rater reliability was measured and found to be high using the intraclass correlation coefficient, additional reliability and validity needs to be attained for the interview rating instrument.

The reliability and validity statistics for the CCQ were based on a final convenience sample of 120 master’s level and post-master’s practitioners. The instrument needs further validation as an assessment of domain-specific cognitive complexity. However, in this study, initial inter-rater reliability for CCQ scores was quite high, a result that contributed to confidence in the reliability of the instrument. Other research is currently being conducted with the instrument to add to the literature (L. E. Welfare, personal communication, August 25, 2012).

Implications and Future Research

The results of this study indicate that cognitive complexity is being assessed only minimally by commonly used admissions criteria for entrance into counseling programs. Kuncel, Hezlett, and Ones (2001), in discussing additional admissions criteria, stated
“for other predictors to provide…validity [to the selection process], they must be correlated with the criterion [outcome measure/s] and typically weakly related, or ideally uncorrelated with other predictors used in the selection system” (p. 176). This study showed that cognitive complexity is only minimally related to other predictors.

Because investigation into the selection of graduate students entering counseling programs is still warranted (Markert & Monke, 1990; Holden et al., 1999; Pope, 1996; Smith, 2004), investigators may want to research cognitive complexity as an admissions criterion. Researchers have linked cognitive complexity to traits and skills that are beneficial in the counseling field (Benack, 1988; Borders, 1989; Borders et al., 1986; Goldberg, 1974; Holloway & Wampold, 1986; Holloway & Wolleat, 1980; Ladany et al., 2001; Lovell, 1999; McAuliffe & Lovell, 2006; Spengler & Strohmer, 1994). If future researchers confirm the findings of this study such that cognitive complexity, as assessed by the modified CCQ, is firmly established as minimally or not related to other counseling program admissions criteria, a next research question is whether cognitive complexity differentiation and integration scores, either individually or in combination with each other and with one or more of the variables of GRE scores, GPAs, and group leader interview ratings, are better predictors of student success in counseling programs and graduates’ success in the counseling field as compared to current admissions variables.

The data from participants in this study constitute a promising resource for such research. In particular, the counseling program to which participants in this study applied assesses students’ relative effectiveness in clinical courses such as Basic Counseling Skills, Advanced Counseling Skills, on-campus Practicum, and field-based
Internship. For participants who actually entered the program, these effectiveness data could be related to participants’ admissions data, including cognitive complexity, to investigate the degree to which the admissions data predicted effectiveness. If cognitive complexity predicts or helps predict effectiveness, its addition to counseling program admissions criteria would be supported.

Another area of research would be to investigate, as others have (Brendel et al., 2002; Duys & Hedstrom, 2000; Fong et al., 1997; Granello, 2002; Little et al., 2005), cognitive complexity throughout a counseling program. Investigators can ask if growth in cognitively complexity is seen even when selecting students of higher cognitive complexity at the beginning of a program. Investigators can also look at whether there is a ceiling effect that occurs with cognitive complexity scores.

Though this is a viable area of future research that has potential for improving selection procedures in counseling programs, counselor educators should be aware that modified CCQ scoring does take time: in this study, an estimated four minutes per instrument. Additionally, if a counseling faculty seeks to enhance reliability by having two raters score the assessments and come to consensus on each differentiation score and integration score, this process takes time as well: in this study, an estimated additional four minutes per instrument. This expenditure of time may represent a practical impediment for counselor educators who find their existing admissions process is already time-intensive.

However, even the additional expenditure of time assessing cognitive complexity might be justified when weighed against the cost of admitting students who, because of ineffectiveness, must discontinue or be dismissed prior to degree completion. If
cognitive complexity enables counselor educators to more accurately predict which applicants will succeed in the counseling program and field, its assessment would seem well worth even a rather substantial investment.

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Welfare, L. E. (2007). *Counselor cognitions questionnaire*. (Available from Laura E. Welfare, PhD, Virginia Tech, 309 Eggleston Hall (0302), Blacksburg, VA 24061. E-mail: welfare@vt.edu).


Current Admissions Procedures

A number of scholars have investigated the criteria that psychology and counseling program faculties use to admit students to their programs (Briihl & Wasieleski, 2004; Holden et al., 1999; Hosford et al., 1984; Leverett-Main, 2004; Markert & Monke, 1990; Morrow, 1993; Smith, 2004). These investigators found that academic criteria, including undergraduate grade point average (UGPA) and Graduate Record Examination (GRE) scores, are the most widely requested pieces of information admissions committees use to evaluate an applicant when entering into counseling training (Fauber, 2006; Schweiger et al., 2012). Admissions committees also routinely ask for letters of recommendation, personal statements, and applicants to participate in admissions interviews (Briihl & Wasieleski, 2004; Leverett-Main, 2004; Markert & Monke, 1990; Norcross, Kohout, & Wicherski, 2006; Pérusse, Goodnough, & Noël, 2001; Schweiger et al., 2012). Though it may seem that admissions standards are set, mental health professional educators continue to debate which criteria are most useful in the admissions process (Helmes & Pachana, 2008).

Leverett-Main (2004) surveyed CACREP-accredited counseling program directors about admissions procedures at their educational institutions. She wanted to know what criteria program directors believed were most effective in screening applicants. Among respondents, 62% ranked the personal interview as the most valuable screening measure in the admissions process. Respondents rated GRE scores and letters of recommendation as the least useful measures requested from students.

Wheeler (2000) asked counselor educators to distinguish between “good and bad students” (p. 69) with whom they had worked. She found respondents rated
students more often on personality characteristics when asked to distinguish them as effective or ineffective students/practitioners. This finding led her to wonder if these personal characteristics should be emphasized and assessed during the application process. Smith (2004) noted an inconsistency in what is used and what is wanted when screening for counseling students.

Academic Criteria

Various authors who have studied the admissions process in counseling and psychology have found that UGPA and GRE scores are the most frequently requested items from students applying for entrance into graduate school (Briihl & Wasieleski, 2004; Leverett-Main, 2004; Markert & Monke, 1990; Norcross et al., 2006; Pérusse et al., 2001; Schweiger et al., 2012). Yet investigators have reached opposing conclusions as to the utility of academic measures to predict success in counseling programs (Hosford et al., 1984; Schmidt, Homeyer, & Walker, 2009).

GRE as a Predictor Variable

A number of researchers have specifically focused on the GRE as a predictor of graduate school success and have written extensively on the validity of this standardized test (Kuncel et al., 2001). Several authors have focused on studying utilization of the GRE in selection of students to counseling or psychology programs (Camp & Clawson, 1979; Halinski, 2009). Other authors have focused on summarizing research of the GRE in meta-analytic studies (Goldberg & Alliger, 1992; Morrison & Morrison, 1995).
Camp and Clawson (1979) investigated predictive validity of the GRE in regards to academic achievement in a Master of Arts counseling program. The authors looked at GRE-verbal (GRE-V), GRE-quantitative (GRE-Q), and GRE-total scores as independent variables affecting counseling program GPA. For this study, the authors reviewed GRE scores of 135 students that were enrolled at that time in a counseling program and calculated correlation coefficients between test scores and graduate school GPA (GGPA). Camp and Clawson found significant correlations between GRE-V scores and GGPA as well as GRE-total scores and GGPA. They did not find a significant relationship between GRE-Q scores and GGPA. Although the relationship between GRE-total score and GGPA was significantly positively correlated, the authors concluded that this relationship was not "powerful enough to imply that the total score of the GRE Aptitude test would be strongly predictive of GGPA in the Master of Arts in Counseling Program at the university studied" (p. 431).

Goldberg and Alliger (1992) conducted a meta-analysis of studies that used the GRE to predict success in counseling and psychology programs. They noted that success in graduate school was measured in several different ways including GGPA, grades in specific courses, scores on comprehensive examinations, and attainment of degree. They calculated correlation coefficients for all outcome criteria as a whole as well as for different categories of outcome criteria.

Goldberg and Alliger (1992) found the psychology subject test of the GRE to be the only predictor of graduate school success when all of the outcome criteria were combined. In looking at different categories of outcome criteria, they noted that GRE-Q scores were correlated with specific course grades that were mostly quantitative
courses. They found that GRE-V and GRE-Q scores had the strongest relationships with comprehensive exam scores, accounting for 13% of the variance. They also found that GRE-Q and GRE-V scores accounted for only 2% of the variance seen in GGPA. The authors concluded

The results from this meta-analysis do not paint a particularly favorable picture for the validity of the Graduate Records Examination. Most of the squared population validity coefficients which were obtained accounted for less than 9% of the variance in the criterion….The results of this meta-analysis demonstrate that, for psychology and/or counseling students, the GRE is not a valid predictor of GGPA. (pp. 1024-1025)

They noted the limited range of grades in graduate school made GGPA a poor outcome measure for GRE validity. They suggested development of better criteria for measuring success in graduate counseling and psychology programs.

Morrison and Morrison (1995) analyzed data from 22 studies using GGPA as the success criterion when predicted from GRE-V and GRE-Q scores. The authors concluded that GRE-V and GRE-Q scores “possess minimal predictive validity” (p. 311) based upon low correlation coefficients between GRE-Q and GGPA ($r = .22$) and GRE-V and GGPA ($r = .28$). They went so far as to call them “useless” (p. 314). With other criticisms of the GRE taken into account such as gender, age, and racial bias, the authors stated its use becomes even more questionable.

Halinski (2009) investigated the analytical writing portion of the GRE (GRE-AW) as a predictor of success in a beginning counseling skills course. She had basic skills instructors rate their students on mastery of basic counseling skills at the end of the semester. She gathered data on 95 beginning counseling students. She found a medium statistically significant correlation between GRE-AW scores and mastery of
basic counseling skills. Through regression analysis, she also found that GRE-AW was predictive of instructor assessed basic skills mastery.

**UGPA and GRE as Predictor Variables**

Hosford et al. (1984) conducted a study that included academic criteria as predictors of success in a graduate counseling program. In their study of 77 students who had matriculated into a counseling psychology program over four years, they found that scores on the GRE-V and Miller Analogies Test (MAT) were significantly correlated to faculty rated academic success at the end of the first year in the program. However, they found no significant correlations between academic criteria (UGPA, standardized test scores) and counseling competence or anticipated professional success as rated by instructors at the end of the first year of graduate study.

Hosford et al. (1984) found negative relationships, though statistically nonsignificant, between scores on the GRE-Q and faculty rated counseling competence as well as anticipated professional success. They also found a similar relationship between UGPA and those outcome measures. Hosford and colleagues concluded standardized test scores may be useful for predicting academic achievement in counselor preparation programs. However, they stated that the findings of negative correlations between some outcome measures (counseling competence and anticipated professional success) and UGPA and GRE-Q scores raise “serious questions about the validity of using these [particular] scores as selection criteria for counselor education programs” (p. 273). It should be noted that the authors did not report probability values for the negative correlations. Without this information, one cannot determine whether
the negative correlations were approaching significance. Because the negative correlations were nonsignificant, these results may have been due to chance.

Morrow (1993) conducted a study to determine the relationship of UGPA and GRE scores with faculty ratings of students. The researcher surveyed faculty members to determine the best and worst students that had graduated from their counselor preparation program between 1980 and 1985. After identifying nine “exemplary” and nine “marginal” graduates (p. 2), the author investigated academic admission criteria in relationship to their rankings by faculty members. He found that UGPA and scores on the analytical portion of the GRE (GRE-A) were significantly related to faculty ratings whereas GRE-V and GRE-Q scores were not significantly related to faculty ratings.

Morrow (1993) further investigated the admissions criteria in relationship to GGPA. He found GRE-V, GRE-Q, GRE-A scores and UGPA were significantly related to GGPA. He found the strongest correlation between the GRE-A score and GGPA. The GRE-V score, GRE-Q score, and UGPA were less strongly correlated with GGPA in that order. Because of these findings, faculty members revised their program’s admissions criteria to place greater emphasis on GRE-A scores.

A follow-up study of students admitted under the revised admissions standards showed that the relationship was still strongest between GRE-A score and GGPA. In this additional study, Morrow (1993) also found GRE-Q score to be significantly correlated with GGPA. He did not find a significant relationship when comparing GRE-V score and UGPA to GGPA. However, when he conducted a stepwise multiple regression analysis, GRE scores accounted for 50% of the variance observed in GGPs.
In a study of 87 students admitted into a rehabilitation counseling program between 1994 and 1997, Alston et al. (1999) investigated if academic criteria used during the admissions process had been predictive of student academic or clinical course success during graduate training. Their results showed that neither overall UGPA, senior year UGPA, nor standardized test scores were significantly related to overall grade point average (GGPA), clinical GPA, or academic GPA. They found different variables including grades in challenging undergraduate courses, ratings on personal essays for admission, and ratings in communication skills as assessed by interview were significantly related to these outcome measures. Specifically, communication scores given from admissions interviews were correlated with GGPA and clinical GPA, and grades in difficult undergraduate courses and student essay ratings were related to GGPA and academic GPA.

Alston and colleagues (1999) additionally conducted regression analyses to determine how well the individual admissions criteria and the total score given to applicants based upon all the criteria predicted academic GPA, clinical GPA, and GGPA. They found that a combination of the communication score, essay rating, challenging coursework score, and total score accounted for 16% of the variance of GGPA. They noted the difficult coursework score and communication score were the strongest contributors to the regression. The same four admissions variables accounted for 11% of the variance observed in academic GPA with the total score being the greatest contributor to the regression. They found the communication score to be the only significant predictor of clinical GPA.
The authors discussed how the high undergraduate academic success and high entrance exam scores could confound the results. They mentioned that placing so much emphasis on academic criteria during admission procedures limits the amount of variance seen in outcome measures due to these specific criteria (Alston et al., 1999). Other authors have also been critical of this restriction of range when studying small variance in graduate program outcome measures (Fauber, 2006; Goldberg & Alliger, 1992; Kuncel et al., 2001).

Kuncel et al. (2001) also conducted a meta-analysis of studies from a wide array of academic disciplines that examined the predictive validity of the academic admissions criteria for graduate school performance. They stated their study improved upon past meta-analyses by including a larger number of studies (1,521 studies) from a variety of disciplines; correcting for statistical errors such as range restriction, unreliability of dependent criteria (subjectivity), and small sample size; and including predictors in combination as independent variables to predict graduate school success.

The authors found that GRE scores were valid predictors of academic performance on most of the dependent variables. They consistently found that subject tests were better predictors than GRE verbal, quantitative, or analytical tests. When the studies were separated by discipline into math-physical sciences, social sciences (including psychology), life sciences and humanities, they found the subject tests to be the best predictors of graduate student performance except when examining degree attainment. The authors found no independent variable was able to predict degree attainment as a measure of graduate school performance. The authors excluded non-
academic outcome measures including class performance and empathy ratings (Kuncel et al., 2001).

In a follow-up article that referenced the Kuncel et al. (2001) study, Kuncel and Hezlett (2007) claimed four conclusions from the meta-analysis:

- Standardized test scores are good predictors of graduate program performance.
- Undergraduate grades and standardized test scores are also predictive of academic outcomes such as research production, faculty ratings, and performance on licensing examinations.
- Standardized admissions tests, when compared to prior college academic records, are better predictors of performance in graduate programs.
- Previous college academic ratings and standardized test scores, used together, provide the best prediction of performance in graduate school.

Smaby et al. (2005) investigated counseling program academic admissions requirements and how they related to counseling skills, personal development, and comprehensive counseling knowledge. The investigators reviewed GRE-V and GRE-Q scores and UGPA as the academic admissions criteria for this study. Their outcome measures included personal development and counseling skills as assessed by the Counselor Skills and Personal Development Rating Form, counseling skills additionally assessed using the Skilled Counseling Scale, and counseling knowledge as assessed by the Counselor Preparation Comprehensive Examination. The authors defined personal development as increased understanding of self and use of that knowledge in effective counseling and personal interactions. They defined counseling skills as tools used to effectively interact with clients during counseling sessions. Eighty master’s level counseling students in a CACREP-accredited counseling program participated in this study.
The authors found that GRE scores and UGPA predicted scores on the Counselor Preparation Comprehensive Examination. The GRE-V test score and UGPA were significant predictors of comprehensive counseling knowledge, whereas the GRE-Q test score was not. The GRE-Q test score was predictive of the score on the research section of the comprehensive examination. The authors also found that UGPA and GRE-V scores were predictive of scores on the Skilled Counseling Scale (Smaby et al., 2005).

Using regression analysis, the authors found that GRE-V and UGPA predicted scores on the Understanding subscale of the Skilled Counseling Scale. The authors did not find a relationship between personal development and UGPA or GRE scores. In summary, they found that GRE-V scores and UGPA predicted academic and limited clinical success. They did not find a relationship between any of the admissions variables and personal development (Smaby et al., 2005).

Schmidt et al. (2009) studied the relationship of standardized test scores and UGPA with comprehensive examination scores at the end of a counselor preparation program. The authors used the information from records of 403 master’s level counseling students enrolled in a counseling program between 1998 and 2005. For this study, Schmidt et al. used UGPA from the final 60 hours of undergraduate study and GRE-V and GRE-Q scores as independent variables. The authors reviewed total and subscale scores from the Counselor Preparation Comprehensive Examination as their outcome measures.

The authors found that GRE-V scores were the most useful predictors for all of the outcome variables. GRE-V scores were the best predictors in all subscales of the
Counselor Preparation Comprehensive Examination except Career and Lifestyle Development (UGPA was a better predictor) and Research and Program Evaluation (GRE-Q score was a better predictor). They found scores on the GRE-V test to be the strongest predictors of passing the comprehensive examination on the first try. The authors concluded that GRE-V and GRE-Q scores were both useful as admissions criteria for determining if a student was going to be successful in acquiring counseling specific knowledge. Additionally, they said UGPA is also a significant, though weaker, predictor of attaining counseling specific knowledge as measured by the Counselor Preparation Comprehensive Examination. The investigators did point out, however, that the percent of variance (21%) accounted for on comprehensive examination scores due to these admissions criteria was small (Schmidt et al., 2009).

Summary Concerning Academic Criteria

The literature reviewed points to conflicting conclusions concerning the use of academic criteria as prediction factors for graduate school success. Some authors concluded GRE scores were not useful predictors of counseling program achievement even though they found significant positive correlations between GRE scores and GGPA. They argued the correlations, though significant, were too small and accounted for limited variance in outcome measures (Camp & Clawson, 1979). Other investigators found that specific academic criteria were predictive of various outcome measures of counseling education, but were wary about their utility in predicting overall graduate school success (Goldberg & Alliger, 1992). Still others found nonsignificant correlations between GRE scores and GGPA (Morrison & Morrison, 1995). Halinski (2009), unlike
the authors above, concluded a portion of the GRE (GRE-AW) to be useful and predictive of counseling basic skills mastery as assessed by instructors.

When reviewing studies examining both UGPA and GRE scores as predictors of success, the conclusions, again, differ. Hosford et al. (1984) found these academic criteria to be predictive of academic success but not clinical success. Morrow (1993) found GRE scores and UGPA to be significantly correlated to GGPA with the GRE-A score having the strongest correlation. Alston et al. (1999) did not find correlations between standardized test scores and UGPA with GGPA. However, examining those criteria with other non-academic measures produced correlations with overall rehabilitation counseling program success. Kuncel et al. (2001) concluded that utilizing UGPA and GRE scores together would give the best prediction of graduate program performance assessed by GGPA, faculty ratings, and research production. Smaby et al. (2005) found academic criteria to be predictive of academic success and, to an extent, clinical success in a counseling program. They did not find that academic criteria could predict personal development. Schmidt et al. (2009) found GRE-V and GRE-Q scores and, to a lesser extent, UGPA to be predictors of comprehensive knowledge at the end of a counseling program.

The results of the studies seem to point toward academic admissions criteria being better predictors of academic success rather than clinical success in counseling programs, although there is some evidence for the latter relationship (Smaby et al., 2005). Because of small, though significant, relationships found between academic admissions variables and graduate program success, authors have concluded the criteria should be utilized with caution. These conclusions justify a continuing search for
additional factors that, separately or in addition to the traditional academic factors, increase predictability of counseling program performance.

Admissions Interview

When choosing which students will enter into counseling programs, many admissions committees use additional tools to gain a more complete profile of candidates and increase their predictive power to select the most potentially successful applicants. Of these additional measures, counselor educators seem to place the greatest weight on admissions interviews (Helmes & Pachana, 2008; Leverett-Main, 2004).

Investigators have pointed to the interview as a complement to cognitive assessments of interviewees (Campion, Palmer, & Campion, 1997). Because the selection of individuals seeking to enter counseling preparation programs is complex (Alston et al., 1999; Pope, 1996; Wheeler, 2000), additional measures of non-cognitive traits seem necessary (Hosford et al., 1984; Smith, 2004). Investigators have written about success in the counseling field having to do more with interpersonal traits than with academic aptitude (Smith, 2004). Leverett-Main (2004) wrote

Respondents [counseling program directors] seemed to agree with prior research that has found that success as a counselor depends less on analytical aptitude and more on a student’s practical abilities….The effective counselor needs personal qualities and interpersonal skills, which are difficult to measure in a format other than a personal interview. (p. 216)

Counselors have been interested in personal attributes (Herman, 1993) or interpersonal traits (Holden et al., 1999) or personal characteristics (Pope & Kline, 1999) and how they are related to counseling skills. Counselor educators have looked
to the admissions interview to assess for these non-cognitive variables (Helmes & Pachana, 2008). Researchers have discovered that personality can be assessed somewhat during the interview process (Barrick et al., 2000), but there is not consensus as to whether these characteristics are related to counseling program success (Halinski, 2009; Holden et al., 1999; Hosford et al., 1984; Rickard & Clements, 1986).

The Interview as an Assessment of Personality

Barrick et al. (2000) investigated how well personality traits including extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience were assessed by interviewers in comparison to self-assessment, close acquaintance assessment, and stranger assessment. Seventy-three undergraduate business students were interviewed and asked to complete a personality assessment. The investigators asked interviewers to complete a personality assessment of the interviewees following the interviews. Investigators had interviewees ask close friends to complete a personality assessment of the interviewees and mail the completed forms back to the researchers. Researchers also asked strangers (interviewers who had not interviewed the participants) to view a videotape of the interviewees stating their names and study case numbers. Those strangers then completed a personality assessment on those participants.

Barrick et al. (2000) found that interviewers could effectively assess personality traits including extraversion, agreeableness, and openness to experience; however the characteristics of emotional stability and conscientiousness posed more of a difficulty for interviewers to identify and measure. The authors stated the results provided evidence
that the interview provides a way for the interviewer to “get to know” (p. 944) the interviewee, but more in-depth personality assessment might take longer or require different measures. Interviewers’ assessments of interviewees’ personalities were more closely related to friends’ assessments than to strangers’ assessments.

Barrick et al. (2000) also examined whether interview structure affected personality assessment. They found the design of the interview did not affect an interviewer’s ability to assess personality. Many researchers have claimed that increasing structure in an interview increases its reliability and validity (Campion et al., 1997; Jelf, 1999), but the results of this study did not support that claim (Barrick et al., 2000).

Research on the Interview Process

Nagpal and Ritchie (2002) studied the admissions interview process in four counseling programs in the state of Ohio. The investigators wanted to know what traits were assessed in applicants during interviews, how the traits were assessed, and how decisions of admission were made after the interview process. Nine counselor educators participated in this research. The authors pointed out that the admissions interviewing process was different in the different programs represented; however, several overarching themes emerged from this qualitative study.

The investigators learned that when interviewing potential students, counselor educators looked for characteristics under three themes: professional attributes, personal attributes, and interpersonal skills. In the category of professional attributes, the counselor educators wanted to know candidates’ goals and motivations for applying
to a counseling program. They also assessed whether candidates were professionally prepared by being somewhat familiar with the counseling profession including knowledge of the counseling education process. Alongside professional preparedness, the counselor educators sought academic preparedness in applicants based upon past educational achievement (Nagpal & Ritchie, 2002).

In the category of personal attributes, counselor educators screened for personal maturity as evidenced by awareness of strengths and weaknesses and applicants’ abilities to monitor their behavior. The respondents also included in this category openness to differences and flexibility. The counselor educators wanted to see evidence that students could handle others being different from them or holding different opinions/beliefs than theirs. Emotional stability, or the absence of significant psychopathology that could interfere with social interactions, was another theme in the category of personal attributes (Nagpal & Ritchie, 2002).

In the category of interpersonal skills, the counselor educators looked for presence or the ability of potential students to genuinely be attentive and psychologically present and communicate this presence to clients. Educators also looked for social appropriateness as evidenced by appropriate dress, sharing time for discussion, comfort with silence, and appropriate use of humor. In this category, counselor educators additionally assessed verbal skill or the applicants’ abilities to communicate and express understanding well (Nagpal & Ritchie, 2002).

In making their decisions about whom to admit, Nagpal and Ritchie (2002) found counselor educators used two processes: information gathering and final decision making. In gathering information, the respondents spoke about using subjective means
for evaluation including gut feelings when listening to responses and observing behaviors. Based upon the content of applicants’ responses, the counselor educators also objectively assessed for traits in which they were interested. In final decision making, the counselor educators used both individual analysis and group influences after discussion. If group discussion did occur, counselor educators stated their opinions could be validated or they could gain new information that helped to make a decision.

Nagpal and Ritchie concluded

Counselor educators seem to be using interviews for determining qualities that are difficult to assess by any other admissions procedure….If…interview procedures and evaluation criteria are improved, the selection interview can be an excellent tool for admitting individuals who will be competent counselors. (p. 217)

Helmes and Pachana (2008) conducted a study surveying clinical directors of Australian psychology preparation programs in order to better understand how the directors utilized the interview and how much importance the directors placed upon information gained in the interview. Twenty-one directors of clinical psychology programs in Australia participated in this study. Three program directors indicated they did not interview applicants at all. The 18 other directors reported using the interviews to assess characteristics such as empathy, interpersonal skills, flexibility, and sensitivity to diversity. They wanted to know whether or not the applicants displayed narcissism and what their motivations were in pursuing clinical work. The directors also mentioned the interview as an anxiety-provoking situation that allowed them to observe the candidates while under stress. Additionally, the directors mentioned looking for inappropriate character traits such as insensitivity, lack of ethical knowledge, and rudeness that could lead to rejection of applicants for admission.
The authors stated that for these program directors, the interview seemed to play "a moderate role" (p. 254) in the selection process. The directors reported undergraduate academic measures as the most important criterion used for admission. Those directors whose programs used the interview generally found it valuable; however, directors whose programs did not use the interview regarded it as minimally valuable citing lack of evidence for its validity and use (Helmes & Pachana, 2008).

Though both of the research articles just reviewed highlight how interviews are useful in the admissions process, the authors of both articles commented on room for improvement in the interview process (Helmes & Pachana, 2008; Nagpal & Ritchie, 2002). One of the primary concerns that scholars have about the interview is whether or not interviewers can garner valid information about a candidate through the interview process that is not gained through other measures (Fauber, 2006). Most research concerning the validity and reliability of selection interviews has come from the discipline of personnel psychology (Campion et al. 1997; Conway, Jako, & Goodman, 1995; Jelf, 1999). A brief review of what scholars have found to improve the psychometric properties of interviews is warranted here.

**Interview Validity and Reliability**

Scholars have stated one of the most important aspects of the interview is its validity in assessing the particular goal for which it is intended (Schmidt & Hunter, 1998). Another factor that has received considerable attention is the reliability of the interview. Campion et al. (1997) listed six different categories of interview reliability to consider when using the interview as an assessment measure.
One of the most commonly stated findings of interview research is that increased structure is related to increased validity and reliability. The structure in an interview has to do with “any enhancement of the interview that is intended to increase psychometric properties by increasing standardization or otherwise assisting the interviewer in determining what questions to ask or how to evaluate responses” (Campion et al., 1997, p. 656). Campion and his colleagues reviewed analyzing the intent of the interview, improving questions, limiting tangential communication, increasing interview length or question number, and limiting exposure of interviewers to additional applicant information to increase structure. Additionally, the authors discussed evaluating interviewee responses in different ways, taking notes, using multiple interviewers or the same interviewer for all candidates, and training interviewers as ways to enhance interview structure (Campion et al., 1997).

Posthuma, Morgeson, and Campion (2002) reviewed other factors that influence interview outcomes. The authors noted the influence of subjectivity on the interview. Factors such as interviewee appearance, demographic and attitudinal similarities between applicant and interviewer, and nonverbal behaviors from both the applicant and interviewer seem to affect interview ratings. All of these factors can affect validity and reliability, and these subjective evaluations are common in interviews. Alston et al. (1999) noted “subjective judgments are a part of almost all decision making; and subjectivity may be even more typical of judgments and decisions within counseling professions” (p. 302).

Counselor educators are aware of interview research (Leverett-Main, 2004) and have written about increasing interview validity. Nagpal and Ritchie (2002) questioned
whether lack of identification of particular characteristics to be assessed during counseling program selection interviews might be the reason selection interviews have been found lacking in validity. They stated counselor educators differ on what traits they assess during the interview process. They wondered if better definition and clarity of the characteristics sought in counseling program applicants would improve interview validity. They questioned whether subjective evaluation factors including interviewer mood, interviewer preferences, and interviewer/interviewee race or other similarities/differences were also causing decreased validity in interviews. Even though these limitations have been voiced, authors have researched the interview in the selection process for counseling students.

Selection Interview Research in the Counseling Field

In their study of admissions criteria as predictors of success in a counseling program, Hosford et al. (1984) included a rating for each applicant based on three admissions interviews. Whereas the authors found some evidence that academic admissions variables of GRE-V and MAT scores were correlated with academic success as assessed by faculty ratings, the interview rating based upon interviews with a faculty member, with two graduate students, and in a group did not correlate significantly with academic success, counseling competence, or anticipated professional performance.

Rickard and Clements (1986) investigated faculty ratings on students who had and had not been interviewed. The authors looked at ratings of 75 students who were enrolled in a clinical psychology program between 1975 and 1982. Thirty-five of the
students had been interviewed; 40 had not. The authors did mention interviews differed during various years, but each candidate who was interviewed participated in at least two interviews with a faculty member and advanced graduate students. The authors found that faculty recommendations for internship, clinical position, or academic position did not differ significantly for interviewed versus non-interviewed students. The authors said results were in contrast to those who adamantly support the interview process as a predictor of clinical skills (Rickard & Clements, 1986). The authors of this study did not explain if or how the information gained during an interview was used to select students to enter the program. Without this information, it is impossible to determine on what basis their non-significant findings are founded.

Alston et al. (1999) found the only admissions variable in their study that was significantly correlated ($r = .42, p < .01$) and a significant predictor of clinical course GPA in a rehabilitation counseling program was a communication score given to applicants following an admissions interview. UGPA and standardized test scores used during the admissions screening process failed to correlate significantly with clinical course grades. They concluded that this finding was evidence for the validity of the interview and subjective ratings in screening for counseling students.

Holden et al. (1999) investigated an interview rating along with two other admissions criteria to see if these factors were predictive of counseling program success. Participants in the study consisted of 79 students who participated in semi-structured group interviews for sociometric rating during the third class session of an introductory counseling course. Fifty-two of the 79 students received a faculty rating after completing practicum. The authors investigated the relationship of the GRE-A
score; the group interview sociometric rating of a student as an effective counselor by a faculty member, doctoral student, and peers; and the sociometric rating of a student as an effective counselor by professors of theory and counseling techniques with the practicum instructor’s end-of-course rating of the student. None of the three criteria were predictive of success in practicum as measured by the faculty members’ ratings. The authors did find significant correlations between average peer interview rating and introductory-course instructor rating as well as counselor educator interview rating and introductory-course instructor rating. The authors noted methodological problems – inconsistency with which various faculty interview leaders adhered to the semi-structured format of the group interviews – which could have accounted for their null findings. Additionally, the researchers did not pursue publication of their manuscript because of these problems (J. Holden, personal communication, July 14, 2012).

Halinski (2009) investigated the relationship between a group interview sociometric rating and success in a basic skills course. This was part of a study that included examining counselor personality characteristics, GRE-AW scores, and group interview ratings in relation to basic skills mastery. She did not find a significant relationship between interview sociometric rating and basic skills mastery as assessed by basic skills instructors. However, when she ran a regression analysis, she found the three predictor variables as a whole to have a large effect size ($R^2 = .368$) on basic skills mastery.

Summary Concerning the Admissions Interview

Though investigators of the interview process have found validity for its use in
assessing personality and that increasing structure tends to improve psychometric properties of the interview, scholars who have studied the selection interview in counseling and psychology programs have come to different conclusions about its necessity and utility. Some scholars have found no relationship between the interview and counseling program success (Hosford et al., 1984). Rickard and Clements (1986) said there were no significant differences in faculty ratings of interviewed and non-interviewed students, but they failed to explain in what manner the interview was used to select students. Alston et al. (1999), Holden et al. (1999), and Halinski (2009) did find that scores garnered from the interview process were correlated with counseling program success, specifically in clinical courses. Thus, the research points to the conclusion that the interview may be useful as one criterion in the selection of counseling program students. Investigators need to continue research in this area for more conclusive evidence and improvement of the interview process.

Cognitive Complexity

Cognitive complexity has been noted as a growing area of interest in the counseling field (McLennan, 1995). Combining information from the disciplines of psychology, human information processing, and cognitive development, counselors have investigated how counselor cognitive complexity affects counseling skills (Goldberg, 1974; Holloway & Wampold, 1986; McAuliffe & Lovell, 2006). Investigators focusing on cognitive complexity in the counseling field have referenced several foundational theorists’ work and the contributions of their theories to the understanding of cognitive complexity.
Foundational Theories

Kelly (1955) outlined his theory of personal constructs by stating that individuals understand their realities based upon similarities and differences of experienced phenomena or constructs. In other words, to understand another, one must understand the person’s experiences to try and realize how the person conceptually links them. Kelly said individuals assume relationships between people, places, objects, or ideas based upon perceived similarities and differences among those things.

Crockett (1965) expanded on Kelly’s theory by applying it to how people perceive others. Crockett posited that a cognitive system concerning people was made up of interpersonal constructs and how those constructs were related and interacted with each other. He stated that when a person encounters another for the first time, the person relates perceived characteristics of the other to existing constructs in one’s cognitive system and then makes assumptions about other characteristics the person may or may not have based on relationships of constructs already in one’s cognitive system. Crockett went on to discuss how a cognitive system with many constructs is termed highly differentiated; a system where constructs are organized and interrelated is termed integrated.

Cognitive complexity, then, is the degree to which a person differentiates and integrates information. Crockett (1965) explained that cognitive complexity was dependent on one’s experiences. He theorized if one had more experience in an area of life, one was likely to have formulated constructs and relationships among constructs in that area of life. In contrast, he postulated an individual with few experiences in an area of life would have constructs that are less differentiated and less organized in that
particular area. Crockett said that cognitive complexity was domain-specific depending on what type of experiences one had encountered.

Similar to Kelly’s (1955) construct theory, Harvey, Hunt, and Schroder (1961) formulated a theory of conceptual systems. They noted that their ideas of how persons organized information were not unlike Kelly’s construct organization. However, Harvey et al. were more concerned with how a person’s way of differentiating and integrating concepts (or constructs) developed based upon conditions present in one’s environment. Thus, they formulated a stage theory of progressive conceptual development describing how individuals processed new information according to their conceptual level. Harvey et al. described how individuals would progress from concrete, externally controlled thinking to abstract, internally controlled cognitions; the individual’s conceptual stage would also be reflected in behavior.

Goldberg (1974) applied Harvey et al.’s stages of conceptual development to counseling. He described first-stage thinkers as persons who analyze situations concretely, use black/white thinking, and seek answers from authorities. Therefore, counselors in this stage of conceptual development were described as more directive, focused on how clients should behave, and dispensers of information. He wrote that second-stage thinkers still thought in concrete categories (black/white), but they questioned authority and external control. Counselors utilizing this conceptual level, then, behave similarly to first-stage thinkers, but they are less predictable in what they expect from clients. Goldberg explained third-stage thinkers as more cognitively complex forming symbiotic relationships with others and being less authoritative. He postulated a counselor in this conceptual level of development tends to ask more
indirect, open-ended questions due to wanting to understand different perspectives of clients. Furthermore, counselors at this stage of thinking also use more reflective responses. Goldberg described fourth-stage thinkers as being aware that different experiences affect their knowledge base and being more open to varied experiences and learning. These individuals are able to view situations from multiple perspectives. He stated counselors at this stage of conceptual development would be more open to ambiguity and exploration of different perspectives from a client.

Current contributors to the literature on cognitive complexity have also relied on William Perry’s work in the area of college student cognitive development. Perry (1968/1999) interviewed college students and formulated a series of stages of cognitive development through which students progress. The interviews focused on examining students’ thoughts concerning knowledge, the role of instructors, and their role as students. Though Perry came up with nine stages, these stages have been condensed into four main categories: dualism, early multiplism, relativism, and committed relativism (Granello, 2010).

Perry (1968/1999) described a student in the dualistic stage of thinking as a concrete thinker focused on black/white, absolutistic thinking. This student believes answers come from authority figures and a student is to play a passive role in learning. He said a student in the multiplistic stage of thinking realizes there may be more than one answer to a given question. For these students, instructors are there to model how to learn, and the student’s role is to learn how to learn. Perry said a student in the relativistic stage of thinking has come to the conclusion that there are no absolutes; uncertainty is certain. Instructors are models as to how to think about uncertainties of
life, and a student focuses on learning to think independently. Finally, Perry said a student in committed relativism comes to certain conclusions based upon experience and is open to novel information. Instructors are seen as equals also engaged in the learning process. Students see their role as that of integrating information from different contexts at different times (Granello, 2010; Perry, 1968/1999).

Researchers have also looked at Jane Loevinger’s work on ego development for a foundation in the measurement of cognitive complexity. Loevinger (1976) stated ego development “is a complex interwoven fabric of impulse control, character, interpersonal relations, conscious preoccupations, and cognitive complexity, among other things” (p. 26). She delineated stages and transitions of development through which people progress and described impulse control, interpersonal style, conscious preoccupations, and cognitive style in each one of the stages. Because her theory of development encompasses interpersonal relations and cognitive complexity, some authors have used ego development as a gauge of complex personal cognitions (Borders, 1989; Borders, Fong, & Neimeyer, 1986; Fong et al., 1997).

King and Kitchener (2004) developed their reflective judgment theory based upon the work of Harvey et al., Perry, and Loevinger along with other developmental scholars. The authors developed a complex stage model concerning how individuals think about knowledge and use their thoughts about epistemology to make judgments concerning controversial issues during late adolescence and adulthood. The authors described seven steps through which individuals progress that have been condensed into three categories: prereflective, quasireflective, and reflective thinking.
King and Kitchener (2004) described prereflective thinkers as individuals certain there are specific answers that can be gained from authority figures. Prereflective thinkers base their conclusions on learned facts or non-researched opinions. The authors described quasireflective thinkers as persons who have realized knowledge develops from internal and external influences. These individuals are certain about uncertainty, and they are open to different approaches and perspectives on issues. The authors described reflective thinkers as individuals who realize knowledge is fluid and can be influenced by newly discovered information and context. These individuals remain open to reevaluation of knowledge and concurrently reach conclusions based upon reflection on information available to them. Many scholars have conducted extensive research substantiating the Reflective Judgment Model (King & Kitchener, 2004).

**Conceptual Level, Ego Development, and Cognitive Complexity**

Investigators have used assessments for conceptual developmental level (Brendel et al., 2002), ego developmental level (Borders et al., 1986; Fong et al., 1997), and cognitive complexity (Duys & Hedstrom, 2000; Little et al., 2005) in their research to see how cognitive complexity is related to counseling skills. Before reviewing this literature, it is important to understand how these ideas are related. Conceptual level (Harvey et al., 1961), Perry positions (Perry, 1968/1999), and ego level (Loevinger, 1976) are developmental ideas. As individuals encounter different experiences during development, their cognitive systems become more complex (Crockett, 1965). Therefore, a person who is at a later level in these stage theories would theoretically
also be more cognitively complex. Welfare stated that overall cognitive development and ego development may impact an individual’s potential for domain-specific cognitive complexity (L. E. Welfare, personal communication, July 17, 2012).

Some authors have used direct assessments of cognitive complexity including the repertory grid technique and Role Category Questionnaire; others have used developmental levels as an indirect way to measure cognitive complexity. Scholars have been critical of this discrepancy (McLennan, 1995). Investigations using both indirect and direct assessments of cognitive complexity will be reviewed.

Cognitive Complexity Assessment

Investigators have used a variety of instruments to indirectly or directly assess cognitive complexity in individuals. Some investigators have used instruments including the Role Category Questionnaire (RCQ) and repertory grid technique developed specifically for cognitive complexity assessment. Others have used the Learning Environment Preferences (LEP), Paragraph Completion Method, Sentence Completion Test, and conceptualization complexity assessments to indirectly gauge cognitive complexity. Authors have reviewed these instruments and have been critical of them for various reasons (McLennan 1995; Welfare & Borders, 2010b).

McLennan (1995) was critical of past research concerning conceptual level and counseling. He stated that sentence or paragraph completion assessments and role construct repertory grid techniques used to measure cognitive complexity were questionable because, although these measures may provide information about an individual’s ability to differentiate information, they fail to provide evidence about an
individual’s ability to integrate information. McLennan wrote both skills were necessary practitioner tools in a counseling session. He called for more domain-specific assessments if conceptual level was going to be a continued area of interest for counselor educators.

Welfare and Borders (2010b) stated that cognitive complexity needs to be correctly measured for its intended purpose in research. They discussed how researchers who want to assess cognitive complexity and its development through a counseling program need to use an assessment that is domain-specific for counseling. They agreed with Fong et al. (1997) that general cognitive complexity may be too broad a category to register domain-specific changes in counselor cognitive complexity. They also reiterated Crockett’s (1965) claim that domain-specific cognitive complexity does not necessarily equate with overall cognitive complexity.

Authors have utilized the LEP, based upon Perry’s collegiate cognitive development model, as a measure of cognitive complexity (Granello, 2002; Lovell, 1999; McAuliffe & Lovell, 2006). Others investigators have used the Sentence Completion Test of Ego Development, based upon Loevinger’s ego developmental model, to assess ego development as a gauge of cognitive complexity (Borders, 1989; Borders et al., 1986; Fong et al., 1997). These measures were developed to assess developmental levels and were not developed for counseling specific purposes (McLennan, 1995; Welfare & Borders, 2010b).

Brendel et al. (2002) and Holloway and Wolleat (1980) utilized the Paragraph Completion Method to assess cognitive complexity, and Goldberg (1974) utilized Harvey’s Conceptual Systems Test that is based upon conceptual level development.
These assessments are used to measure conceptual level; however, they are not
domain specific for counseling (McLennan, 1995; Welfare & Borders, 2010b).

The RCQ and repertory grid technique are assessment instruments developed
more specifically to measure cognitive complexity. Authors have used both of these
instruments in cognitive complexity research (Duys & Hedstrom, 2000; Little et al.,
2005; Spengler & Strohmer, 1994). Borders and Welfare (2010b) were critical of these
instruments for not capturing the totality of cognitive complexity by measuring both
differentiation and integration.

Ladany et al. (2001) used a content analysis procedure to measure integrative
complexity in participants’ case conceptualizations. Whereas Welfare and Borders
(2010b) reviewed this measure as being counseling specific, they also noted a lack of
measurement for differentiation and imprecise scoring.

Counselor Cognitions Questionnaire. Welfare reviewed counselor development
and cognitive complexity literature to develop the CCQ. The author based the instrument
on the Role Category Questionnaire (RCQ). Welfare changed the language of the RCQ
to be more specific to the counseling profession. She then added tasks of importance
rating and categorization to assess integration. The author sought feedback from panels
of students, counselor educators, and experts in the field of cognitive complexity in the
initial stages of instrument development. The author made revisions to the first draft of
the instrument based upon feedback (Welfare & Borders, 2010b).

The author conducted a pilot study of the instrument with a convenience sample
of master’s and doctoral students in order to assess amount of time necessary for
instrument completion and to receive feedback concerning the clarity of instrument
directions. After setting a time limit of 15 minutes for the instrument and making revisions based on pilot study feedback, Welfare conducted another pilot study to determine instrument validity and reliability. The author found that the CCQ scores differed from scores obtained from persons who also completed the RCQ during this second pilot study. A correlation statistic between differentiation measured by the RCQ and differentiation measured by the CCQ was nonsignificant; thus, the author concluded counselors understood their clients differently than they did their peers. The author noted that differentiation and integration scores as assessed by the CCQ were correlated ($r = .48, p < .01$), but were different enough to show evidence that the two constructs are different factors in cognitive complexity. Also, inter-rater reliability coefficients were above .95 for both differentiation and integration scores (Welfare & Borders, 2010b).

Welfare subjected the CCQ to additional study to further differentiate domain-specific cognitive complexity from general cognitive complexity as assessed by the Sentence Completion Test of Ego Development. For this phase of instrument development, the author administered the CCQ to a convenience sample of 120 participants including master’s counseling students and post-master’s counselors. The author found that differentiation and integration scores for counselors who had graduated were generally higher than for students in counseling education programs. Welfare claimed this finding supported the idea that the CCQ is a measure of cognitive development. The author found that the CCQ and Sentence Completion Test were not significantly correlated, and this limited correlation was cited as evidence that the CCQ
is measuring domain-specific cognitive complexity that differs from general cognitive complexity as measured by ego development (Welfare & Borders, 2010b).

The author also conducted analysis of variance studies to see if the instrument was appropriate for use with counselors in different specialties. She found no significant differences among specialties in differentiation scores. She did find that mental health counselors scored significantly higher in integration than school counselors yielding a significant mean difference in integration scores. Upon further analysis, she found significantly more mental health counselors in this phase of instrument study were practicing professionals who had completed their degrees compared to counseling program students who claimed the school counseling specialty (Welfare & Borders, 2010b).

Cognitive Complexity and Counseling

Researchers interested in cognitive complexity and counseling have focused on two broad areas of study. First, counselor educators have investigated development of student cognitive complexity throughout counseling programs (Brendel et al., 2002; Duys & Hedstrom, 2000; Fong et al., 1997; Little et al., 2005). Educators have asked if, and to what extent, cognitive complexity can develop while a student is in a counseling program. Second, investigators have studied whether increased counselor cognitive complexity is related to better counseling skills (Benack, 1988; Borders, 1989; Borders et al., 1986; Goldberg, 1974; Holloway & Wampold, 1986; Holloway & Wolleat, 1980; Ladany et al., 2001; Lovell, 1999; McAuliffe & Lovell, 2006; Spengler & Strohmer, 1994).
Cognitive Complexity in Counseling Programs

Brendel et al. (2002) discussed the differences between persons with different levels of cognitive complexity and their problem-solving skills. They described people with lower levels of cognitive complexity as concrete thinkers with less ability to solve problems creatively as compared to individuals with higher levels of cognitive complexity who are more adaptive and use complicated reasoning skills when finding solutions to problems. The authors noted that even though reasoning and behavior skills have been shown to be associated with more highly developed psychological functioning, there is still hesitancy from counseling programs to emphasize cognitive development.

Duys and Hedstrom (2000) investigated counselor education and its effect on student cognitive complexity. In this study, the authors assessed cognitive complexity at the beginning and end of a semester using the Role Category Questionnaire (RCQ). Thirty-six students were in a basic skills course, whereas 36 other students in the control group were enrolled in other non-experiential counseling courses that included group, ethics, research, and tests and measurements. The authors found a significant difference in scores of cognitive complexity of the experimental and control groups at the end of the semester. They concluded that supervised experiential courses are one way to increase cognitive complexity in counseling students.

Using 30 students in a master’s counseling program as participants, Brendel et al. (2002) assessed two phenomena – moral reasoning using the short version of Kohlberg’s Defining Issues Test and conceptual level/cognitive complexity using the Paragraph Completion Method – at three points: before beginning a counseling
preparation program, one year into the program, and nine months after the second assessment. The authors found mean scores assessing moral reasoning did increase, but not significantly, with progression through the program. The authors found that cognitive complexity scores did increase through a counseling training program utilizing the Deliberate Psychological Training model, but they noted that significant gains in cognitive complexity occurred only after students had undertaken experiential coursework.

Little et al. (2005) focused their study on determining if the Skilled Counselor Training Model (SCTM) affected counseling skill level, self-assessment, and cognitive complexity level in students. Fifty-nine first year counseling students made up the sample. The experimental group was made up of 40 students enrolled in a counseling theories and processes course. The 19 students in the control group were enrolled in a non-clinical introduction to counseling class.

Little et al. (2005) used the Skilled Counseling Scale (SCS) to assess counseling skill level. The authors utilized the Role Category Questionnaire (RCQ) to assess cognitive complexity. The authors defined cognitive complexity as “the number of interpersonal constructs a person can use to define social reality” (pp. 192-193). Participants submitted six-minute mock counseling sessions that were assessed for counseling skill level before and after exposure to the SCTM. They also used the SCS immediately after their mock sessions to assess themselves on their counseling skills. Furthermore, they completed the RCQ before and after being taught the SCTM. Participants in the control group completed the same instruments, but they were not trained using the SCTM.
The authors found students trained with the SCTM did score significantly higher in counseling skills after training. They also found students educated with the model increased significantly in cognitive complexity as compared to students not educated with the model. Whereas they did find differences in students’ ability to self-assess like more experienced counselors, ability to assess exactly like more experienced counselors was not attained during the semester of counseling education. The experimental group assessed themselves more stringently than trained raters by the end of the experience (Little et al., 2005).

In contrast to the research articles reviewed above, other investigators have found minimal gains in cognitive complexity during counselor preparation. Fong et al. (1997) performed a longitudinal study of cognitive development in counseling program students. Forty-eight students participated in this study. The authors used a variety of instruments to assess cognitive events (thoughts about a client), cognitive processes (thoughts about one’s own counseling), and cognitive schema (ego developmental level). In this study cognitive complexity was equated to ego development and measured using Loevinger’s Sentence Completion Test of Ego Development. The authors found no significant changes in ego development from the start of the program to completion of the program. The authors noted changes in thoughts after basic skills courses and changes in processes after fieldwork. The authors pointed to the study as evidence for small changes at different times in different aspects of cognition during a counseling program. They were concerned about the lack of change seen in ego development that they equated to cognitive complexity. They hypothesized that ego
development may be too broad a concept to measure the cognitive complexity changes occurring during education in a counseling program.

Granello (2002) improved upon the previous studies reviewed concerning counseling education and cognitive complexity by including a larger number of students from different educational establishments. Granello included 205 students enrolled in counseling master’s degree programs in 13 different institutions. She utilized the Learning Environment Preferences assessment to measure students’ cognitive developmental levels and compared student cognitive developmental levels at three points during counseling education: beginning, middle, and end. Although differences in mean cognitive complexity index scores among beginning, middle, and end counseling students were small, there was a statistically significant variance between group means \((F = 4.78, \ p < .05)\). Also, it seemed most cognitive development occurred during the latter part of counseling education rather than the beginning. Like Brendel et al. (2002), Granello noted more development in cognitive complexity after clinical course experience. Neither experience in the human services field, age, nor grade point average was related to cognitive development.

The research reviewed points to differing conclusions concerning the development of cognitive complexity during counseling education. Some authors noted significant gains in student cognitive complexity (Brendel et al., 2002; Duys & Hedstrom, 2000; Little et al., 2005) whereas others found only minimal gains in cognitive growth (Fong et al., 1997; Granello, 2002).

Interestingly, authors of two of the three studies reviewed, in which significant development in cognitive complexity occurred during counseling education, measured
cognitive complexity using the RCQ, a more direct measure of complex cognitions (Duys & Hedstrom, 2000; Little et al., 2005). In contrast, Fong et al. (1997) and Granello (2002) measured cognitive complexity indirectly using assessments for ego developmental levels and Perry positions, respectively. These findings may be discordant due to more direct versus indirect measures of cognitive complexity.

Counselor educators are additionally interested in cognitive complexity development because of research that has linked it to skills and attributes that are important in the counseling field.

Cognitive Complexity and Counseling Skills

Goldberg (1974) studied counseling students’ conceptual level in relation to responses provided during counseling sessions. The study consisted of 86 master’s level counseling students in a beginning counseling course. The author used Harvey’s Conceptual Systems Test to assess the conceptual level of each participant and the counselor interaction analysis system along with The Counselor Verbal Response Scale to analyze participants’ responses to 20 stem statements to which they were asked to respond in the best possible way. The author found more directive responses were correlated with lower levels of conceptual development. Those counselors at higher stages of conceptual development responded with higher levels of understanding, more attunement to client feelings, and greater exploratory responses to specific prompts. The author concluded that “conceptual level may be an important variable for counselor selection and program development” (p. 364).
Holloway and Wampold (1986) conducted a meta-analysis of studies investigating conceptual level in relation to counseling-related tasks. The authors described low conceptual level persons as black/white thinkers placing a great deal of emphasis on external factors for direction in making decisions. They said high conceptual level persons are cognitively more complex and rely on internal processes for direction. Holloway and Wampold found through their analysis of research that high conceptual level persons performed better than low conceptual level persons (based upon a mean effect size of 1.07) in counseling-related activities including knowledge acquisition, affect intensity, demonstration of empathy, and assertive behavior.

McAuliffe and Lovell (2006) undertook a study to gain more insight into the phenomenon of some counseling students more easily understanding and applying client-centered techniques than others. They wanted to know why some students “got it” while others did not. They thought students’ inability to understand and apply ideas taught might be related to their way of approaching knowledge or cognitive developmental level. The authors developed this study to discover any relationship between a counseling student’s personal epistemological level (cognitive developmental level) and the counseling student’s behavior during counseling sessions.

The authors used the Learning Environment Preferences inventory to assess epistemological development (cognitive development) at the beginning of a basic skills course. The authors chose 12 students (six scoring highest in dualistic thinking and six scoring highest in relativistic thinking – the extremes) to participate in this study. They reviewed the counseling interviews of these students at the midpoint of the basic skills
course and noted distinctions among the dualists and relativists in this study in five categories (McAuliffe & Lovell, 2006).

McAuliffe and Lovell (2006) found that relativists were able to understand and reflect back a client’s perspective without relying on authority or allowing their own perspective to influence their responses. The authors found that dualists tended to reflect superficial experiences whereas relativists tended to reflect implicit/unstated/deeper content from client cues. Dualist participants also reflected less upon their responses before making them; they responded in concrete, predictable ways from what they had learned in class. Relativist participants, on the other hand, seemed to have more reasoning behind their responses, using past information from counseling sessions to formulate them, and were able to critique themselves and think of alternative ways to help their clients. Relativist participants seemed more able to allow clients to stay in a state of questioning/ambiguity. Relativist counseling students were more tolerant of this feeling of uncertainty. Dualist participants tended to look for and give answers to their clients when a problem was brought up in session. The authors concluded the students’ cognitive developmental level was an important factor in how they responded in counseling sessions.

Cognitive Complexity and Client Conceptualizations

Holloway and Wolleat (1980) investigated the relationship between counselor conceptual level as measured by the Paragraph Completion Method and clinical experience with a counselor’s ability to formulate a diagnosis and plan from a client’s presenting characteristics. The authors discussed how the formulation of a diagnosis
and plan is a complicated process requiring a practitioner to make a variety of complex judgments; thus, a counselor’s skill in clinical hypothesis formation was hypothesized to be related to conceptual developmental level. Specifically, they hypothesized counselors measuring higher in cognitive complexity would use more and a greater variety of information when formulating client conceptualizations.

Holloway and Wolleat (1980) recruited 37 first semester counseling students to participate in this study. A month after assessing conceptual level, the authors showed the participants a video of a counseling session and then administered the Clinical Assessment Questionnaire to measure the complexity of their clinical hypothesis formations.

The authors found that conceptual level and overall clinical hypothesis formation quality/clarity were related. Specifically, the investigators found a significant relationship between conceptual level and number of relevant, novel questions asked by the counseling students. The authors did not find a relationship between clinical experience and quality of clinical hypothesis formation (Holloway & Wolleat, 1980).

Basing their hypotheses on Loevinger’s integrative model of development, Borders et al. (1986) measured counseling students’ ego developmental levels to compare them to complexity of client perceptions. The authors assumed counselors at higher ego developmental stages would be more open to differences, empathic, understanding of relationships, and able to deal with identity issues. The participants in this study were 63 counseling students enrolled in practicum or internship. Borders et al. used the Repertory Grid Technique to assess structure and content of student counselors’ perceptions of their clients and the Sentence Completion Test of Ego
Development to measure trainees’ ego developmental levels. Borders and colleagues (1986) did not find significant differences in variation or structural complexity of client perceptions based on different ego developmental stages. However, they did find that students who measured at higher developmental levels described their clients in more relationship-oriented terms. That is, they seemed more aware of the interactional process occurring in counseling and used this awareness in descriptions of clients. They stated that content of perceptions was critical to understanding the cognitive sophistication of client perceptions. In summary, it appears Borders et al. found evidence of increased cognitive complexity based on content of client perceptions among different ego levels but not based on structural complexity and variation.

Borders (1989) assumed counselors’ conceptualizations were a reflection of their cognitive development based upon cognitive-developmental theories and supervision models. She hypothesized their thoughts about counseling sessions would reflect differences in ego developmental levels. Using 27 practicum students as participants, Borders used the Sentence Completion Test of Ego development to measure ego stage and the Counselor Retrospection Coding System, an adaptation of Interpersonal Process Recall, to assess in-session cognitions. At mid-semester, the participants chose a recorded counseling session they believed to be an accurate representation of their counseling skills. Immediately after the session, the students reviewed the tape while thinking aloud to describe their thoughts and feelings during session. Borders found students at higher ego developmental levels had fewer negative thoughts about their clients and were less critical of themselves.
Spengler and Strohmer (1994) cited Hollow and Wolleat (1980) when they stated that more cognitively complex clinicians would ask more questions, consider more diagnoses, and make more accurate clinical judgments. These skills, they hypothesized, should decrease clinician bias in emphasizing some diagnostic information over all information presented (diagnostic overshadowing). To test this assumption, they had 119 doctoral level clinicians complete the Mental Retardation Preference Scale to assess the clinicians’ preference for working with individuals diagnosed with mental retardation and a repertory grid to assess clinicians’ cognitive complexity.

The authors found “that counselors with low cognitive complexity were three times more likely to overshadow than were counselors with high cognitive complexity” (p. 13). In other words, low cognitive complexity counselors did not diagnose a co-occurring disorder along with mental retardation even though the symptoms for that disorder were presented. Counselors who scored higher in cognitive complexity seemed to be less prone to jumping to a diagnosis and disregarding other information when prominent symptoms were given; they still looked at all the information and made different hypotheses. The authors noted high cognitive complexity counselors avoided stereotyping and bias (Spengler & Strohmer, 1994).

Ladany et al. (2001) explored how students’ case conceptualization integrative complexity, a measure of counseling domain-specific cognitive complexity, was related to experience in counseling. They used the measure of conceptualization complexity as a gauge of conceptual development related to a student’s counseling experiences. Ladany et al. hypothesized that more specific experiences would yield more complex
conceptualizations with specific client disorders. They also postulated conceptualization complexity as a measure of conceptual level would be related to students’ preferred supervisory style – that highly developed students would prefer less structure than students at lower conceptual levels.

The authors used Suedfeld’s content analytic procedure to measure integrative complexity of student case conceptualizations and the Supervisory Styles Inventory to assess the type of supervision the students wanted. The authors measured counselor experience by asking students to provide information about total number of clients seen, specific diagnoses with which students had worked, and months of counseling experience with and without supervision. Ladany et al. (2001) found that increased counseling experience and increased supervision experience were related to more cognitively complex case conceptualizations. However, they did not find support for their hypothesis that conceptualization complexity was related to preferred supervision style.

Cognitive Complexity and Empathy

Benack (1988) hypothesized that a counselor at a higher conceptual level would attempt to understand a person’s thoughts, feelings, and behaviors based upon that person’s worldview. This openness to a person’s worldview affecting their perceptions would be displayed by increased empathy. Also, because of this searching attitude, the counselor’s responses might be more uncertain and open to revision. To test these hypotheses, Benack conducted three separate studies.

In the first study, the author asked 15 students enrolled in a “client-centered” introductory graduate counseling course to serve as participants. Benack (1988)
measured epistemological reasoning using a semi-structured interview. Participants were categorized as dualistic (simple dualism and multiplism) or relativistic (uncommitted or committed relativism) thinkers based upon Perry’s cognitive development model. The author watched videos of participants engaged in mock counseling sessions to assess empathic understanding. The author found that relativistic thinkers scored higher in all categories of empathy compared to dualistic thinkers. The author suggested that relativistic thinkers could possibly be more empathetic; however, the author also postulated dualistic thinkers might just believe more directive responses were better in session while still having the ability to empathize. The author did follow-up studies to achieve more clarity on this point.

Benack (1988) had 18 undergraduate students participate in a second study. The investigator assessed epistemological thought using the same semi-structured interview as in the first study, and the participants were categorized as dualistic or relativistic thinkers. To assess empathic understanding, the author gave participants seven hypothetical counseling vignettes. The participants were supposed to imagine themselves in the clients’ mind and write about how the clients were feeling, thinking, and perceiving. The author found that relativists were more tentative in interpreting the client’s experience than dualists.

The author had 24 undergraduate students participate in a third study. Epistemological thought was assessed with the same semi-structured interview. The author assessed choice of counseling strategies by presenting the students with three vignettes in which they were to place themselves in the role of the counselor and respond. Although rare, most students who did respond non-directively had been
categorized as relativistic thinkers. Students categorized as relativists were more likely
to communicate understanding to the client.

Benack stated that the studies showed "a strong tendency for people who think
relativistically about epistemological issues to more frequently and accurately express
empathic understanding of other people’s inner experience" (1988, p. 229). The author
noted the latter two studies were of students who had not participated in any counseling
preparation courses. She concluded that a person’s conceptual level had much to do
with that person learning to express empathy and that counselor educators should
consider this finding when teaching basic counseling skills. Although she did not
address using this information for counseling program admissions decisions, she stated
"a person’s epistemological assumptions may be a powerful determinant of his or her
aptitude for learning to express empathy as a counseling technique" (p. 230).

Lovell (1999) used a larger sample than previous research to find correlations
between Perry positions and empathy. Three hundred and forty counseling graduate
students participated in the survey. The author used the Hogan Empathy Scale to
assess empathy and the Learning Environmental Preferences inventory to assess
cognitive developmental level. The author found cognitive development and empathy
are moderately positively related ($r = .31, p < .001$). The author found evidence of
increased empathy at each of the Perry positions. Lovell argued cognitive development
may be one way to increase empathy and counselors may look for ways to increase
cognitive development in order to improve their own empathy skills.
Summary of Cognitive Complexity Research

Scholars have researched cognitive complexity in two broad areas. The research reviewed points to cognitive complexity as a trait that can develop when students are progressing through counseling programs (Brendel et al., 2002, Duys & Hedstrom, 2000; Granello, 2002; Little et al., 2005). Investigators have also found correlations between cognitive complexity and skills and attributes beneficial to counseling. Specifically, individuals at higher levels of cognitive complexity were able to ask more questions (Holloway & Wolleat, 1980) and formulate different, complex hypotheses (Holloway & Wolleat, 1980; Ladany et al., 2001; Spengler & Strohmer, 1994) about client presentations. They appeared more able to remain objective during sessions without being overly critical of clients (Borders, 1989). Additionally, they seemed to understand inner experiences and communicate this understanding better to clients (Benack, 1988; Goldberg, 1974; McAuliffe & Lovell, 2006). Their responses to client cues displayed more thought and reasoning and went to a deeper level (Benack, 1988; McAuliffe & Lovell, 2006), and they seemed to be more aware of the relational aspect of counseling and their part in it (Borders et al., 1986). Their high cognitive complexity allowed for increased empathy (Benack, 1988; Lovell, 1999). Finally, they seemed to be more at ease with ambiguity and led their clients to look at different alternatives for themselves (McAuliffe & Lovell, 2006).

Summary of Reviewed Literature

When selecting students to enter counseling programs, admissions committees review various criteria (Schweiger et al., 2012). Investigators have questioned whether
UGPA and GRE scores are predictive of success in counseling programs (Markert & Monke, 1990). Scholars have found that these academic criteria are useful in predicting academic success (Kuncel et al., 2001). However, overall success in a counselor preparation program requires more than just success in the academic domain (Leverett-Main, 2004; Pope, 1996; Smith, 2004; Wheeler, 2002). Noting that non-academic variables are also important, admissions committees have utilized the selection interview to assess personal characteristics of applicants (Leverett-Main, 2004; Helmes & Pachana, 2008; Nagpal & Ritchie, 2002). Researchers who have investigated the selection interview have also reached conflicting conclusions. Some question its use (Fauber, 2006; Hosford et al., 1984; Rickard & Clements, 1986) and others have found some utility for predicting counseling program success (Alston et al., 1999; Holden et al., 1999; Halinski, 2009). The admissions process continues to be a complex phenomenon warranting further investigation (Alston et al., 1999; Markert & Monke, 1990; Schmidt et al., 2009; Sedlacek, 2003).

Research in the area of cognitive complexity and counseling has led to two main findings: scholars have found evidence for student cognitive complexity growth during counselor education (Brendel et al., 2002; Duys & Hedstrom, 2000; Little et al., 2005; Granello, 2002) and increased cognitive complexity has been linked to positive counselor characteristics (Goldberg, 1974; Holloway & Wampold, 1986; Lovell, 1999; McAuliffe & Lovell, 2006). Because of the latter finding, applicant cognitive complexity may be a variable that counseling program admissions committees may want to assess when accepting students into their programs (Goldberg, 1974; Smaby et al., 2005). First, however, the variable must be investigated in relationship to existing admissions
criteria (Kuncel et al., 2001). The relationship of applicant cognitive complexity to applicant UGPA, GRE scores, and group interview ratings will be the focus of this study.
APPENDIX B

DETAILED METHODOLOGY
In this appendix, I present my research question and assumption. I define terms relevant to the study and discuss assessment instruments used in my research. I also expand on planned data collection and analysis.

Research Question and Assumption

For this study, I posed one question: To what degree do common admissions criteria (previous academic coursework GPA, GRE scores, and admissions group interview ratings) predict counseling program applicants' cognitive complexity scores of differentiation and integration as measured by the Counselor Cognitions Questionnaire (CCQ; Welfare, 2007)? My assumption for this study was that cognitive complexity was related to academic aptitude as measured by previous academic coursework GPA and GRE scores and traits assessed during group interviews; therefore, admissions criteria commonly used to assess applicants would predict differentiation and integration scores of the CCQ.

Definition of Terms

For clarity and specific purposes in this study, I defined and operationalized the terms below as follows.

Cognitive Complexity

Cognitive complexity is a cognitive ability trait describing how well a person differentiates specific pieces of information and integrates these data for useful purposes. More experience in a particular domain will affect cognitive complexity in that
domain (Crockett, 1965). Cognitive complexity was operationalized using the two scores gained from the modified CCQ: one score assessing differentiation and a second score assessing integration (Welfare & Borders, 2007).

Converted Previous Coursework GPA

The counseling program converts previous coursework GPAs into rating scores from 1 to 10. Because some applicants have last-60-hours of undergraduate coursework GPAs, others have total undergraduate GPAs, and still others have completed some master's level work, the counseling program has devised a way to convert scores to a common rating system based upon what the graduate school sends for each applicant. The conversion table is below. In this study, I used the converted GPA rating as the independent variable in the statistical analyses.

Table B.1

Conversion Table

<table>
<thead>
<tr>
<th>Rating</th>
<th>Total UGPA</th>
<th>Last 60 UGPA</th>
<th>Master’s GPA</th>
</tr>
</thead>
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<tr>
<td>0</td>
<td>≤ 2.79</td>
<td>≤ 2.99</td>
<td>≤ 3.49</td>
</tr>
<tr>
<td>1</td>
<td>2.80 – 2.91</td>
<td>3.00 – 3.09</td>
<td>3.50 – 3.54</td>
</tr>
<tr>
<td>2</td>
<td>2.92 – 3.03</td>
<td>3.10 – 3.19</td>
<td>3.55 – 3.59</td>
</tr>
<tr>
<td>3</td>
<td>3.04 – 3.15</td>
<td>3.20 – 3.29</td>
<td>3.60 – 3.64</td>
</tr>
<tr>
<td>4</td>
<td>3.16 – 3.27</td>
<td>3.30 – 3.39</td>
<td>3.65 – 3.69</td>
</tr>
<tr>
<td>5</td>
<td>3.28 – 3.39</td>
<td>3.40 – 3.49</td>
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<td>3.90 – 3.94</td>
</tr>
<tr>
<td>10</td>
<td>3.90 – 4.0</td>
<td>3.90 – 4.0</td>
<td>3.95 – 4.0</td>
</tr>
</tbody>
</table>

Counseling Program

Counseling program refers to a CACREP-accredited counseling program located in the southwestern United States. This counseling program offers master's degrees in
elementary and secondary school counseling, college and university counseling, and clinical mental health counseling. The program also has a doctoral program in counseling.

Differentiation

Differentiation is defined as the number of constructs counselors have in their cognitive systems to describe and understand people with which they work. A differentiation score is calculated based on the number of distinct characteristics counselors recognize in their clients. When calculating the differentiation score for the CCQ, scorers count the number of characteristics written down for two people described. Scorers give one point for each characteristic and sum the number of characteristics from each person described. Scorers subtract a point for any shared characteristics found in the descriptions of both people (Welfare & Borders, 2007).

Group Interview

Group interview refers to a semi-structured interview process in which applicants to the counseling program above are asked to participate. The applicants are randomly divided into groups of eight to 10 and led in a series of exercises by a program faculty member and doctoral student. The activities during the group interview include discussions of values and counselor characteristics. Applicants are also asked to give and receive positive feedback from group members towards the end of the group interview time. Before being dismissed, applicants are asked to confidentially rate themselves and other group members based upon impressions gained through the
group interview. The process takes approximately 2.5 hours to complete (University of North Texas Counseling Program, n.d.).

Integration

The dimension of integration in cognitive complexity is a process and not a quantitative capacity making it more difficult to measure. Integration in a cognitive system is how a person relates distinct constructs and hierarchically organizes them (Crockett, 1965). Welfare and Borders (2007) described integration as the activation and connection of constructs to form an understanding of others.

On the CCQ, scorers quantify integration by first assessing for a balance of positive and negative characteristics in the descriptions of both people. Scorers give one point for each client if the characteristics are balanced. Secondly, scorers give one point for including characteristics from each of the following categories in the descriptions of each client: cognitive, spiritual, emotional, contextual, and behavioral. Respondents can receive up to 10 points if all five categories are used in both client descriptions. Thirdly, scorers assess recognition of the helping relationship in the client descriptions. For example, if a client is described as “resistant to counseling,” one point is awarded for that person described. Scorers can give up to two points for recognition of the helping relationship in the descriptions of both people. Fourthly, scorers count the number of categories respondents developed for the descriptors of each client. To count, the categories must include more than one descriptor. Scorers sum the number of categories from each person described and subtract a point for any shared categories between the two descriptions of people. Finally, scorers assess categories
for awareness of the counseling relationship. For example, a category of “things that make it difficult for me to work with this person” reflects awareness of the relationship. A respondent can receive one point for each person described if the helping relationship is referred to in the categorizations (Welfare & Borders, 2007).

Participants

Participants were applicants to the counseling program in the Fall 2012 and Spring 2013. Because the quota of students to be accepted to the program was far less than the applicant number, prior to invitation to attend the Orientation and Interviews, the Master’s Admissions Committee analyzed applicants’ GRE and previous coursework GPA scores in order to place applicants in quartiles by these academic indicators. In the invitation to attend the Orientation and Interviews, applicants were informed of the quota of acceptance and their quartile ranking among the total number of applicants in order to fully inform them of their chances of acceptance.

In Fall 2012, the counseling program had 68 applicants; three indicated they would submit a DVD in lieu of attending the in-person group interviews, and of the remaining 65 invited to the interviews, 64 attended. In Spring 2013, the counseling program had 173 applicants; 10 indicated they would submit a DVD, and of the remaining 163 applicants invited to the interviews, 131 attended. I asked all applicants who were present at the Orientation and Interviews to participate in this study. The final number of attendees at both orientations was 195. Some attendees chose not to participate in the study, some participated but did not write their packet number next to their name on the orientation sign-in sheet, and a few attendees at the second
Orientation and Interviews were reapplying after having been denied admission in the Fall and, as such, had already participated in the study.

The final number of completed assessments matched with applicant admission criteria and demographic information used for this study was 182, of which 167 participants (91.8%) were female and 15 (8.2%) were male. The participants included 148 individuals (81.3%) identifying themselves as White, 11 (6%) as Asian, 11 (6%) as Hispanic, 10 (5.5%) as African-American, one (0.5%) as Indian, and one (0.5%) as biracial. Participants ranged in age from 20 to 52 with a mean of 25 years and a mode \((n = 60)\) of 22 years. One hundred thirty four (73.6%) applicants were between the ages of 20 and 25. Thirty-three (18.1%) of the applicants were between the ages of 26 and 30. Ten (5.5%) of the applicants were between the ages of 31 and 40. Five (2.7%) of the applicants were older than 40.

Instrumentation

For this study, I sought to determine the predictive relationship of converted GPAs, GRE scores, and group interview faculty leader ratings to differentiation and integration cognitive complexity scores as assessed by a modified version of the Counselor Cognitions Questionnaire (Welfare, 2007). In this section of the dissertation, I provide a brief overview of the GRE, the group interview leader rating, and the CCQ.

Graduate Record Examination (GRE)

The GRE revised General Test was introduced in August 2011 and has three sections: verbal (GRE-V), quantitative (GRE-Q), and analytical writing (GRE-AW).
Educational Testing Service (ETS) stated the test measures verbal and quantitative reasoning, analytical writing, and critical thinking skills that are closely aligned with skills necessary to be successful in a variety of graduate programs. Three scores are reported when a person takes the GRE revised general test. GRE-V and GRE-Q scores are reported on a 130-170 score scale in one point increments (Educational Testing Service, 2012b). Because ETS introduced the revised version of the general test in 2011, some applicants had taken an earlier version of the GRE. I used the concordance tables provided by ETS (Educational Testing Service, 2012a) to compare the different scale scores of the GRE-V test and GRE-Q test in the two versions of the assessment. The GRE-AW score is reported on a 0-6 point scale in half point increments (Educational Testing Service, 2012b).

Investigators have studied the GRE standardized test extensively and have found it to be a valid measure of graduate school academic performance (Kuncel & Hezlett, 2007). Researchers have found corrected meta-analytic estimates ranging from .41 to .59 for the GRE predicting first year graduate student grades in a variety of disciplines (Kuncel et al., 2010). ETS estimated the reliability of the GRE-V test at .93, of the GRE-Q test at .94, and the GRE-AW test at .79. ETS stated the reliability estimates for the GRE-V and GRE-Q test are based on item response theory. ETS has recommended that GRE scores be used with other criteria in the selection of students for graduate level education; the scores should not be used as the sole criterion for admissions (Educational Testing Service, 2012a).
Group Interview Faculty Leader Rating

For this study, group interview procedures followed those the counseling program uses consistently as described in the University of North Texas Counseling Program (n.d.) document. Each interview group consisted of 8-10 applicants, and the co-leaders for each interview group consisted of one faculty member and one doctoral student. During the group interview, co-leaders guided applicants through a series of semi-structured activities including group member introductions, a values identification and consensus activity, a discussion concerning desirable and undesirable counselor characteristics, and a strength bombardment activity. At the end of the approximately 2.5 hour group interview, co-leaders asked applicants to confidentially rate themselves and each member of their group from extremely poor (1) to extremely good (5) in six areas: effectiveness of expression, understanding of others, genuineness, caring, respect for diversity, and overall potential as an effective counselor. Co-leaders also rated applicants in the same manner (University of North Texas Counseling Program, n.d.). Each participant’s group interview faculty leader rating was the average score of the six ratings the faculty co-leader gave the participant.

Counselor Cognitions Questionnaire

To assess cognitive complexity, I used a modified version of the Counselor Cognitions Questionnaire (CCQ; Welfare, 2007). The CCQ measures how one conceptualizes clients and is an assessment of cognitive complexity in the counseling domain. Welfare and Borders (2010a) based the CCQ in personal construct theory.
They improved on previous cognitive complexity measures by making this instrument specific for counselors and also adding assessment of cognitive complexity integration.

For the CCQ, respondents describe two clients: one whom they believe they were effective in helping with a problem and a second whom they believe they were less effective in helping with a problem. Respondents are asked to describe these clients as completely as possible by writing down all characteristics in two separate grids of each client that come to mind. Respondents are then asked to label each characteristic written down as positive, negative, or neutral. For each client described, respondents are next asked to group the descriptive characteristics into categories (Welfare, 2007).

Raters use a detailed scoring protocol to count the number of descriptors respondents provide for each individual; they also count the number of categories into which the respondents can organize the descriptors for each individual. Raters give sub-scores for a balance or imbalance of positive and negative descriptors as well as the number of types of descriptors used. Welfare and Borders (2007) specified five types of client descriptions: cognitive, spiritual, emotional, contextual, and behavioral. Additionally, raters assess the counselors’ recognition of the counseling relationship in the descriptions and categorizations. The CCQ yields a score of cognitive complexity differentiation and a score of cognitive complexity integration (Welfare & Borders, 2007).

Because participants in my study were not yet counselors or even counseling students, I obtained permission from Welfare to modify the CCQ minimally to make it appropriate for applicants to a counselor preparation program. Instead of asking participants to describe two clients, I asked participants to describe two people (L. E.
Welfare, personal communication, June 18, 2012). The CCQ can be administered in a group or individually and requires 15 minutes for completion (Welfare & Borders, 2007).

Welfare and Borders (2010b) reported a positive correlation between CCQ integration and differentiation scores ($r = .64, p < .01$) in the final phase of instrument development using a convenience sample of 120 master’s and post-master’s participants. They claimed this relationship as evidence for the validity of having two scores to represent cognitive complexity: one for differentiation and a second for integration. Additionally the authors found statistically significant differences in differentiation ($F = 23.7, p < .01$) and integration ($F = 14.49, p < .01$) scores of master’s and post-master’s level participants. Welfare and Borders claimed this result served as evidence that the CCQ discriminates between beginning level counselors and practitioners who have more experience.

The authors did not find a statistically significant difference in differentiation scores ($F = 1.075, p > .10$) among the counseling specialties of college, school, family, and mental health counseling. However, they did find a statistically significant difference in integration scores among specialties ($F = 2.78, p < .05$). Upon further analysis, the authors found participants who identified themselves as mental health practitioners scored significantly higher on CCQ integration than participants who identified themselves as school counselors. The authors looked more closely at the data and found a higher number of post-master’s participants who were mental health counseling practitioners. They stated this difference in sizes of comparison groups might have confounded the results (Welfare & Borders, 2010b).
Welfare and Borders (2010b) reported the Pearson product-moment correlation between the CCQ differentiation total and Sentence Completion Test total as .14 (p > .10) and between the CCQ integration total and Sentence Completion Test total as .16 (p > .05). The authors said these nonsignificant correlations indicated the CCQ measured something different than general cognitive complexity: domain-specific counselor cognitions about clients. Welfare and Borders (2010b) reported inter-rater reliabilities of .99 and .96 for differentiation and integration totals, respectively, of the 120 scored assessments. They stated that inter-rater reliabilities of .90 or above are acceptable for the CCQ (Welfare & Borders, 2007).

Procedures
Group Interview Leader Rater Training

To establish group leader inter-rater reliability, I developed a mock applicant training video that all faculty group co-leaders watched. In the video, I had three mock applicants introduce themselves and describe their reasons for wanting to enter the counseling program. In the final portion of the video, I recorded the three mock applicants participating in the group consensus task of the group interview process.

I designed the scripts for the three mock applicants to be distinctive: one applicant was meant to be high-scoring, one applicant was meant to be mid-scoring, and one applicant was meant to be low-scoring. I asked all faculty group co-leaders to watch the training video and rate each applicant’s potential to become an effective counselor on a 5 point Likert scale: 1 = extremely poor, 2 = poor, 3 = fair, 4 = good, and 5 = extremely good.
I calculated an average measures intraclass correlation coefficient of 0.99 for all group leaders who watched the video. In order to prevent drifting in applicant ratings from Fall group interviews to Spring group interviews, I asked faculty group co-leaders who had led interview groups in the Fall to re-watch the mock applicants video in the Spring, and I provided them with the average rating for each applicant and asked that they keep the ratings in mind as they re-watched the video.

Participant Recruitment

After attaining approval from the Institutional Review Board at the University of North Texas (UNT) for my study, I recruited participants from the applicants who attended the master’s in counseling program Orientation and Interviews process in the Fall 2012 and Spring 2013. The counseling program informed the applicants that research was being conducted on the admissions process and that all applicants with a completed application packet were being invited to the Orientation and Interviews. The counseling program also provided applicants with their quartile ranking (top quartile, 2nd quartile, 3rd quartile, or bottom quartile) based upon academic criteria so that applicants could make an informed decision about attending the Orientation and Interviews. The program informed applicants that because a larger number of applicants were being invited to the Orientation and Interviews, a smaller percentage of those attending would be accepted.

At the orientation session to the counseling program held before the group interviews, I asked applicants to participate in my study. I informed them of the purpose of the study, procedures, foreseeable risks, benefits, and procedures for maintaining
confidentiality of research records. I emphasized to the applicants that neither their participation nor their scores on the cognitive complexity assessment would have any bearing on the decision by the Master’s Admissions Committee concerning which applicants would be admitted to the program. I asked applicants willing to participate to sign an informed consent form and then administered the modified CCQ.

**CCQ Scoring and Applicant Data**

At the orientation session, I gave all applicants a research packet containing one modified CCQ and two informed consent forms. The applicants put their names on a sign-in sheet to the orientation session and placed their research packet numbers next to their names. The research packet numbers matched the modified CCQ assessment numbers inside the packets. If applicants chose to participate in the study, they signed one of the informed consent forms and returned it with the completed modified CCQ in the research packet. At the end of the orientation session, I collected all research packets. The orientation facilitator took the sign in sheet with the applicant names and research packet/assessment numbers to a counseling program administrative assistant.

Once I collected the research packets, I removed the signed informed consent forms and gave those to a counseling program administrative assistant. I did this to protect the applicants’ confidentiality - hindering myself from being able to match the modified CCQs with the names of the applicants who completed them. The only person with this information and the ability to match the applicants’ names with the modified CCQ assessment numbers was the counseling program administrative assistant.
I asked a doctoral level counselor familiar with research procedures to assist me in scoring the completed assessments. She and I completed the training as described in Counselor Cognitions Questionnaire: Rater Training Manual (Welfare & Borders, 2007). We then scored the assessments individually. After scoring the CCQs, I calculated a Pearson correlation coefficient for our differentiation and integration scores. For the data collected in the Fall 2012, $r = .97$ for differentiation scores and $r = .86$ for integration scores ($n = 62$). For the data collected in the Spring 2013, $r = .96$ for differentiation scores and $r = .87$ for integration scores ($n = 124$). The doctoral level rater and I reviewed each assessment on which our scores differed and came to a consensus score for final data analysis.

Once we decided on final differentiation and integration scores for each assessment, I sent a list of the modified CCQ scores along with the assessment numbers to the counseling program administrative assistant. The administrative assistant had compiled a spreadsheet with other applicant information and replaced the applicants’ names with their research packet numbers. The administrative assistant added the modified CCQ differentiation and integration scores to this spreadsheet of applicant information. The final spreadsheet contained GRE-V, GRE-Q, and GRE-AW scores; group interview leader ratings; and converted GPAs. The spreadsheet also included demographic information consisting of gender, age, and ethnicity of each applicant.

Data Analysis

I examined demographic information gathered from participants including age,
gender, and ethnicity. I compared converted previous coursework GPAs, GRE scores, and group interview leader rating scores to cognitive complexity scores for all participants in the study. I acquired the assistance of a doctoral level counseling practitioner who read, understood, and completed the training exercises in the Rater Training Manual for the Counselor Cognitions Questionnaire to help in scoring the CCQ. Welfare and Borders (2007) stated that multiple raters should be used when scoring CCQs for research purposes.

After consulting with a university statistician, I used SPSS software to perform two multiple regression analyses using converted GPAs, GRE scores, and group interview faculty leader ratings as predictor variables on the dependent variables of cognitive complexity differentiation and cognitive complexity integration. With five independent variables, an $N$ greater than 90 is recommended based on the formula $N > 50 + 8m$ where $m$ is the number of independent variables (Tabachnick & Fidell, 2007). Standard multiple regression analyses allowed me to see how well the independent variables related to and predicted cognitive complexity scores of differentiation and integration (Pallant, 2010).
APPENDIX C

UNABRIDGED RESULTS
Results

I examined the admissions variables and cognitive complexity scores of 182 participants for this study. One participant’s previous academic coursework GPA was unavailable at the time of data analysis. Table C.1 shows the ranges, means, and standard deviations for all predictor variables and dependent variables in the multiple regressions.

Table C.1

*Descriptive Statistics (Ranges, Means, Standard Deviations) for all Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRE-V</td>
<td>182</td>
<td>134.00</td>
<td>164.00</td>
<td>151.03</td>
<td>5.76</td>
</tr>
<tr>
<td>GRE-Q</td>
<td>182</td>
<td>132.00</td>
<td>168.00</td>
<td>147.70</td>
<td>6.12</td>
</tr>
<tr>
<td>GRE-AW</td>
<td>182</td>
<td>2.00</td>
<td>5.50</td>
<td>3.84</td>
<td>0.68</td>
</tr>
<tr>
<td>GPA</td>
<td>181</td>
<td>0.00</td>
<td>10.00</td>
<td>5.69</td>
<td>3.10</td>
</tr>
<tr>
<td>Interview</td>
<td>182</td>
<td>2.50</td>
<td>5.00</td>
<td>4.45</td>
<td>0.50</td>
</tr>
<tr>
<td>Differentiation</td>
<td>182</td>
<td>9.00</td>
<td>41.00</td>
<td>19.85</td>
<td>5.74</td>
</tr>
<tr>
<td>Integration</td>
<td>182</td>
<td>5.00</td>
<td>19.00</td>
<td>10.47</td>
<td>2.71</td>
</tr>
</tbody>
</table>

I ran two regression analyses to determine if the independent variables (GRE-V score, GRE-Q score, GRE-AW score, converted GPA, and group interview faculty leader rating) predicted an applicant’s differentiation score and integration score on the modified CCQ. A multiple regression is a family of techniques used to explore the relationship of one continuous dependent variable and a number of predictors or independent variables. In a standard multiple regression, all independent variables are entered into the equation at the same time. A researcher can then see how much variance in the dependent variable is explained by the group of independent variables as a whole. In addition, a researcher can observe how much variance in the dependent variable is explained by each independent variable on its own (Pallant, 2010). My
assumption for this study was that predictor variables of GRE-V, GRE-Q, GRE-AW, converted GPA, and group interview faculty leader rating would predict scores of cognitive complexity differentiation and cognitive complexity integration as measured by the modified CCQ.

To check for multicollinearity, I examined the correlations between the independent variables in the regression models. Correlations between the independent variables were as follows: GRE-V and GRE-Q ($r = .630$), GRE-V and GRE-AW ($r = .462$), GRE-V and group interview faculty leader rating ($r = .140$), GRE-V and converted GPA ($r = .268$), GRE-Q and GRE-AW ($r = .393$), GRE-Q and group interview faculty leader rating ($r = .057$), GRE-Q and converted GPA ($r = .279$), GRE-AW and group interview faculty leader rating ($r = .110$), GRE-AW and converted GPA ($r = .167$), group interview faculty leader rating and converted GPA ($r = .215$). Pallant (2010) stated multicollinearity exists when the independent variables have high correlations of 0.7 or above. None of the independent variables were highly correlated. I also examined Tolerance and variance inflation factor (VIF) values. None of the Tolerance values were less than 0.10 indicating that multiple correlation with other variables was acceptable for each independent variable. All VIF values were below 10 indicating no multicollinearity (Pallant, 2010).

I examined the residual probability plots and scatterplots to see if assumptions of data linearity, normality, and homoscedasticity were met. In examining the residual probability plots for both regression analyses, points were distributed in a reasonably straight diagonal line from bottom left to top right. Pallant (2010) stated this was evidence of no major deviations from normality. I reviewed the residuals scatterplots
and found the data points to be roughly rectangularly distributed. This is evidence of normality, linearity and homoscedasticity (Tabachnick & Fidell, 2007). I found one outlier in the data by inspecting the Mahalanobis distances but did not exclude it from the data set because of the large participant number in the study and because it was only slightly outside the critical value (Pallant, 2010).

Regression analysis revealed the model did significantly predict differentiation scores, $F(5,175) = 2.483, p = .033$. $R^2$ for the model was .066, and adjusted $R^2$ was .040. For a multiple correlation analysis, Cohen (1988) defined a small effect size as $R^2 = .019$ and a medium effect size as $R^2 = .13$. Therefore, the effect size for this model is small. Table 2 shows a summary of regression coefficients. In terms of individual relationships between the predictor variables and differentiation scores, GRE-V ($t = -0.112, p = .911$), GRE-Q ($t = -0.021, p = .983$), GRE-AW ($t = 2.589, p = .010$), converted GPA ($t = 0.271, p = .787$), and group leader interview rating ($t = 1.563, p = .120$), only the independent variable of GRE-AW made a significant unique contribution to predicted modified CCQ differentiation.

A second regression analysis revealed the model did significantly predict integration scores, $F(5,175) = 3.789, p = .003$. $R^2$ for the model was .098, and adjusted $R^2$ was .072. Applying Cohen’s (1988) effect size criteria, .098 represents a small effect. Table C.2 shows a summary of regression coefficients. In terms of individual relationships between the predictor variables and integration scores, GRE-V ($t = 0.386, p = .700$), GRE-Q ($t = 1.368, p = .173$), GRE-AW ($t = 1.642, p = .102$), converted GPA ($t = 1.194, p = .234$), and group leader interview rating ($t = 1.173, p = .242$), no
independent variable made a significantly unique contribution in predicting modified
CCQ integration scores.

Table C.2

Results of Regressing CCQ Differentiation and Integration Scores on GRE Scores,
Converted GPAs, and Group Leader Interview Ratings

<table>
<thead>
<tr>
<th>Variable</th>
<th>Constant</th>
<th>Coefficient</th>
<th>B</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>SEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differentiation</td>
<td></td>
<td></td>
<td>8.586</td>
<td>0.066*</td>
<td>0.040*</td>
<td>5.62</td>
</tr>
<tr>
<td>GRE-V</td>
<td>-0.011</td>
<td>-0.011</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRE-Q</td>
<td>-0.002</td>
<td>-0.002</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRE-AW</td>
<td>1.821</td>
<td>0.216*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td>0.039</td>
<td>0.021</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interview</td>
<td>1.351</td>
<td>0.118</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integration</td>
<td>-5.285</td>
<td></td>
<td></td>
<td>0.098**</td>
<td>0.072**</td>
<td>2.609</td>
</tr>
<tr>
<td>GRE-V</td>
<td>0.018</td>
<td>0.038</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRE-Q</td>
<td>0.057</td>
<td>0.129</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>GRE-AW</td>
<td>0.536</td>
<td>0.135</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td>0.080</td>
<td>0.092</td>
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<tr>
<td>Interview</td>
<td>0.470</td>
<td>0.087</td>
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</tr>
</tbody>
</table>

*p < .05. **p < .01.

Discussion

My assumption for this study was that cognitive complexity was related to other
variables being used to select students for entrance into counseling programs;
therefore, regression analyses using common admissions criteria (GRE scores,
converted GPAs, and interview ratings) as independent variables would predict
modified CCQ dependent variables of cognitive complexity differentiation and cognitive
complexity integration. I found admissions criteria commonly used to assess applicants,
as a whole, were statistically significant in predicting cognitive complexity scores.

However, regression results also revealed that admission criteria accounted for
only 6.6% of variance in cognitive complexity differentiation scores and 9.8% of
variance in cognitive complexity integration scores – findings that corresponded to the
small effect size results. Therefore, although the results were statistically significant, their practical significance indicated that GRE scores, converted GPAs, and group interview faculty leader ratings were only minimally predictive of cognitive complexity. This finding supports the idea that the cognitive complexity instrument used in this study measures a phenomenon substantially different from academic aptitude, as measured by GRE scores and GPAs, and personality characteristics, as assessed by group interview ratings.

Limitations

The participants in this study were applicants to one counseling program in the southwestern United States. Additionally, participants were predominantly female, under the age of 25, and White. Although this demographic may fairly well represent counseling applicants nationally, these factors, nevertheless, limit the generalizability of conclusions that can be drawn from this study (J. Holden, personal communication, June 19, 2013).

The group interview faculty leader rating needs further research and validation. The group co-leaders do receive the same instructions for leading the group interviews; however, there are differences among co-leaders in how the groups are facilitated. Additionally, how interviewees are rated differs among co-leaders and participants. One rater may rank generously and another may rank more reservedly. Although faculty co-leader inter-rater reliability was measured and found to be high using the intraclass correlation coefficient, additional reliability and validity needs to be attained for the interview rating instrument.
The reliability and validity statistics for the CCQ were based on a final convenience sample of 120 master's level and post-master's practitioners. The instrument needs further validation as an assessment of domain-specific cognitive complexity. However, in this study, initial inter-rater reliability for CCQ scores was quite high, a result that contributed to confidence in the reliability of the instrument. Other research is currently being conducted with the instrument to add to the literature (L. E. Welfare, personal communication, August 25, 2012).

Implications and Future Research

The results of this study indicate that cognitive complexity is being assessed only minimally by commonly used admissions criteria for entrance into counseling programs. Kuncel et al. (2001), in discussing additional admissions criteria, stated “for other predictors to provide...validity [to the selection process], they must be correlated with the criterion [outcome measure/s] and typically weakly related, or ideally uncorrelated with other predictors used in the selection system” (p. 176). This study showed that cognitive complexity is only minimally related to other predictors.

Because investigation into the selection of graduate students entering counseling programs is still warranted (Markert & Monke, 1990; Holden et al., 1999; Pope, 1996; Smith, 2004), investigators may want to research cognitive complexity as an admissions criterion. Researchers have linked cognitive complexity to traits and skills that are beneficial in the counseling field (Benack, 1988; Borders, 1989; Borders et al., 1986; Goldberg, 1974; Holloway & Wampold, 1986; Holloway & Wolleat, 1980; Ladany et al., 2001; Lovell, 1999; McAuliffe & Lovell, 2006; Spengler & Strohmer, 1994). If future
researchers confirm the findings of this study such that cognitive complexity, as assessed by the modified CCQ, is firmly established as minimally or not related to other counseling program admissions criteria, a next research question is whether cognitive complexity differentiation and integration scores, either individually or in combination with each other and with one or more of the variables of GRE scores, GPAs, and interview ratings, are better predictors of student success in counseling programs and graduates’ success in the counseling field as compared to current admissions variables.

The data from participants in this study constitute a promising resource for such research. In particular, the counseling program to which participants in this study applied assesses students’ relative effectiveness in clinical courses such as Basic Counseling Skills, Advanced Counseling Skills, on-campus Practicum, and field-based Internship. For participants who actually entered the program, these effectiveness data could be related to participants’ admissions data, including cognitive complexity, to investigate the degree to which the admissions data predicted effectiveness. If cognitive complexity predicts or helps predict effectiveness, its addition to counseling program admissions criteria would be supported.

Another area of research would be to investigate, as others have (Brendel et al., 2002; Duys & Hedstrom, 2000; Fong et al., 1997; Granello, 2002; Little et al., 2005), cognitive complexity throughout a counseling program. Investigators can ask if growth in cognitively complexity is seen even when selecting students of higher cognitive complexity at the beginning of a program. Investigators can also look at whether there is a ceiling effect that occurs with cognitive complexity scores.
Though this is a viable area of future research that has potential for improving selection procedures in counseling programs, counselor educators should be aware that modified CCQ scoring does take time: in this study, an estimated four minutes per instrument. Additionally, if a counseling faculty seeks to enhance reliability by having two raters score the assessments and come to consensus on each differentiation score and integration score, this process takes time as well: in this study, an estimated additional four minutes per instrument. This expenditure of time may represent a practical impediment for counselor educators who find their existing admissions process is already time-intensive.

However, even the additional expenditure of time assessing cognitive complexity might be justified when weighed against the cost of admitting students who, because of ineffectiveness, must discontinue or be dismissed prior to degree completion. If cognitive complexity enables counselor educators to more accurately predict which applicants will succeed in the counseling program and field, its assessment would seem well worth even a rather substantial investment.


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