

# Developmentally Relevant Career Constructs: Response Patterns of Youth with ADHD and LDs

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## Abstract

The vocational needs of adolescents with Attention Deficit Hyperactivity Disorder (ADHD) and Learning Disabilities (LDs) have been generally overlooked in vocational research. Exploration of relevant career development constructs can illuminate our understanding of the post-school transition needs and strengths of youth with disabilities. Given the increasing prevalence of these disorders, this study compared the response patterns of 258 adolescents with ADHD and LDs on dimensions of career thoughts, attitudes, and vocational identity. Participants were administered the *Career Thoughts Inventory* (CTI), *Career Maturity Inventory –R* (CMI-R), and *Vocational Identity* (VI) to examine the differences in response patterns. Using univariate ANOVA analyses, results showed that levels of VI were significantly related to all CTI subscales and a CMI-R subscale. A diagnosis of LD or ADHD was significantly related to the Decision-Making Confusion (DMC) subscale of the CTI and the CMI-Att subscale of the CMI-R. Implications for practice and future research are discussed.

**Keywords:** Attention deficit/hyperactivity disorder, learning disabilities, negative career thoughts, attitudes, post-school transition, and vocational identity

Youth with disabilities are vulnerable to negative outcomes in their vocational lives due to experiences with marginalization, stereotypes, and continued attitudinal barriers (Vash & Crewe, 2004) in social, school, and work settings. Negative career thinking can impair an individual's ability to solve career problems and make career decisions (Sampson, Reardon, Peterson, & Lenz, 2004) resulting in lower than average self-efficacy. The inability to select a career path or direction can cause major difficulties during the transition from adolescence to adulthood. Adolescence is described as a difficult period because individuals are beginning to explore interests, discover new talents, and make choices and commitments at a time when they are experiencing major physiological and biological changes (Halpern, 2009; Lapan, 2004). Ng and Fieldman (2007) found that the ease or difficulty of this first major life transition, occurring at the end of high school, may impact employment-related adjustment later in life, and future coping with vocational changes. However, research addressing these processes among youth with disabilities is limited (Fabian & Liesener, 2005), as most of the existing literature focuses on youth without disabilities.

The call for further career research on marginalized groups, including individuals with disabilities (Blustein, 2006; Whiston, 2011), demonstrates the need to inform practitioners of best practices in

supporting career development. Issues surrounding vocational identity, career choice readiness, and negative career thinking are closely tied to the developmental tasks associated with adolescence and must be given appropriate attention. Using evidence-based interventions, combined with strength-based, developmental and preventative approaches (Walsh & Gallassi, 2002), can assist students with disabilities in reducing dysfunctional career thoughts and strengthening vocational identity, making way for continued resilience throughout their career paths. Extending career research to include youth with disabilities can further the understanding of career development and transitional needs among underserved groups.

Attention-deficit/hyperactivity disorder (ADHD) and learning disabilities (LDs) are two of the most common developmental problems of childhood and adolescence (Jakobson & Kikas, 2007). Yet, attention to the unique career development and post-school transition needs of these youth is generally absent in the scholarly literature. Given the increasing prevalence of these diagnoses, and the limited understanding of how they impact success at work, empirical studies can assist practitioners of the vocational strengths and weaknesses unique to each population.

ADHD is a neurodevelopmental disorder (Gregg, 2009) involving the frontal lobes and marked by behavioral disinhibition and

executive function dysregulation. An estimated 3-7% of school-aged individuals in the United States (US) have a diagnosis of ADHD (Monastra, 2008). Problems with time management, focused attention, task initiation and completion, procrastination, forgetfulness, and difficulty with scheduling and setting priorities are work-related difficulties associated with ADHD symptomatology (Barkley, 2006; Dipeolu, 2011). Higher than average levels of irritability, hostility, negative affect, emotional hyper-responsiveness, and low frustration tolerance are common (Ngg, 2006). Despite being the most comprehensively studied mental health disorder in school-aged children (Monastra, 2008), there is limited empirical support to provide individualized career interventions for students with ADHD, in addition to students with LDs.

LDs are conditions in which there is a failure to develop expected and adequate academic skills in various educational areas (Deutsch & Davis, 2010). LDs can impair the ability to achieve adequate work performance and efficiency, complicating career development concerns in adolescence (Ochs & Roessler, 2001; Rojewski, 1999) and adulthood. It is estimated that 4-7% of school-aged US students have a specific LDs (Buttner & Hasselhorn, 2011; Geary, 2006; Mercer & Pullen, 2005), the most prevalent being reading disability. Symptoms of ADHD and LDs do not resolve on their own and interventions are often required (Shaywitz, 2003), including post-school interventions for optimal work functioning in adulthood.

The symptoms of ADHD and LDs are often discussed concurrently in scholarly literature, and extrapolating findings from one population to the other is common. Scholarly research has not yet

addressed the transition and career development needs unique to each diagnosis. The disorders are unmistakably discrete, evidenced by distinct diagnostic criteria and varying effects on functioning. The hyperactive-impulsive symptoms of ADHD do not appear to have a shared genetic relationship with LDs (Gregg, 2009). In youth with ADHD, control and impulse inhibition are impaired, whereas LD are associated with impairments in phonological awareness, verbal memory span, storytelling ability, reading comprehension, and information processing (Korkman & Pesonen, 1994; Ofiesh, Mather, & Russell, 2005). This study aimed to empirically identify areas of commonality and/or difference among these populations to avoid extrapolating findings from one diagnosis to the other.

Two purposes guided this study. The first was to build on existing research examining the career development needs and strengths unique to youth with ADHD and LDs by focusing on the career development constructs of decision-making confusion, commitment anxiety, external conflict, vocational identity, and career attitudes/readiness. The second purpose was to fill a gap in career development research by comparing the response patterns of these discrete populations by exploring the dimensions of career thoughts, attitudes, and vocational identity to better illuminate the needs and strengths unique to each population. The variables of interest in this study, which included dysfunctional career thoughts, career maturity/readiness and vocational identity, were chosen based on their relevancy to developmental tasks associated with adolescence.

### Career Development Research on Youth with Disabilities

Limited attention has been paid to the experience of children and adolescents with disabilities in vocational research (Foley-Nicpon & Lee, 2012) and examination of career thoughts and attitudes, along with vocational identity, can help to highlight the needs and strengths of youth with disabilities. Widely recognized and empirically supported as a measure of career readiness and attitudes, the *Career Maturity Inventory* (CMI-R) has utility in career development work with adolescents (Patton & Creed, 2007a; Creed, Patton, Prideaux, 2007). Among adolescents, a relationship exists between the level of career maturity/readiness and decision-making, suggesting that a lack of career readiness may lead to indecision about career selection, and vice versa. *Vocational Identity* (VI), is a crucial task during adolescence, and the development of a strong ego identity is central in overall identity development (Skorikov & Vondracek, 2007). VI demonstrates an inverse relationship with negative, maladaptive career constructs, including indecisiveness, depression, and lack of goal stability (Skorikov & Vondracek, 2007).

Existing data on negative career thoughts, attitudes, and vocational identity suggest that youths with LDs respond differently when compared with those without LDs, and that it is possible to predict scores for individuals with LDs on these relevant constructs (Dipeolu, 2007; Dipeolu, Hargrave, Sniatecki, & Donaldson, 2012). Additionally, researchers have found that ADHD symptoms were predictive of negative career thoughts (Painter, Prevatt, & Welles, 2008). Career thoughts and attitudes have also

recently been found to significantly predict VI in a sample of adolescents with ADHD (Dipeolu, Sniatecki, Storlie, & Hargrave, 2013).

In our extensive review of literature, most existing studies with these populations compare ADHD to a non-ADHD sample, LDs to a non-LD sample or simply extrapolate findings from one population to the other. This study aimed to empirically identify areas of commonality and/or difference among these populations, guided by the following hypotheses: 1) Significant differences would be found in the ways in which students with ADHD and LDs responded to each of the career development constructs; 2) Significant differences in response patterns associated with three levels of VI (High, Moderate, and Low) would be found; and 3) Significant interactions would be found in the CMI-R and CTI subscale scores between group and VI levels.

## Methods

### Sample

Participants consisted of 258 high school students, 119 diagnosed with ADHD (46.1%) and 139 (53.9%) with LDs. As such, all the participants were tested, diagnosed, and were receiving supportive services for their particular disability. Students had an existing diagnosis of ADHD or LDs, and qualified for special education services under Part B of the Individuals with Disabilities Education Improvement Act (IDEIA, 2004), and defined by Section 504 of the Rehabilitation Act of 1973. Student experiences were assumed to be generally equivalent in participating schools based on the uniform federal guidelines for special education and disability services across the United States.

The students with ADHD were recruited from special education classrooms in three high schools in the northeastern US and consisted of 35 females (29%) and 84 males (70.6%), representing grades 8-12. They self-identified as White, non-Hispanic (45.4%,  $n=54$ ), African American (37%,  $n=44$ ); Hispanic (7.6%,  $n=9$ ), Native American (2.5%,  $n=3$ ), Asian (0.8%,  $n=1$ ), and Other (4.2%,  $n=8$ ). The average age of the participants was 15.7 years ( $SD = 2.01$ ), and the sample included freshmen (34.5%), sophomores (20.27%), juniors (16%), seniors (21.8%), and unidentified (7.6%).

The LDs sample consisted of students identified with the following LDs: 47 (34%) reading; 39 (28%) written expression; 36 (26%) mathematics; 7 (5%) written expression and reading; 6 (4%) math and reading; 3 (2%) math, reading, and written expression; and 1 (1%) unknown. The students with LDs were recruited from special education classrooms in two school districts in the Midwest, one rural and one urban, and were from ten different schools. Participants consisted of 39 females (28%) and 100 males (72%). They self-identified as White, non-Hispanic (77.2%,  $n=99$ ), African American (12.9%,  $n=18$ ); Hispanic (7.9%,  $n=11$ ), Native American (6.5%,  $n=9$ ), and Asian (1.4%,  $n=2$ ). The sample consisted of 49 freshman (35%), 26 sophomores (19%), 35 juniors (25%) and 29 seniors (21%). The mean age was 16.4 years ( $SD = 1.5$ ).

### Procedures

Three hundred consent letters were sent to parents/guardians of students with ADHD requesting participation with eleven hundred and eleven returned for a

37% response rate. Assent was also obtained from each student. Four students did not sign the assent form and were not included in the study.

Three hundred and eighteen parents/guardians of students with LDs were targeted for recruitment and contacted via mail. Of these, one hundred and fifty (47.1%) gave consent for their child to participate. Assent was also obtained from each of the participants with LDs. Three students declined participation, and eight did not sign the assent form and were excluded. Thus, one hundred and thirty-nine total students with LDs participated. A transition specialist and a graduate assistant administered the instruments to the participants. Accommodations that included periodic breaks and the use of a reader were offered to all; however, no students utilized these accommodations during data collection. This is not an improbable response given that students who participated in this study are part of school districts with strong and intensive programs of intervention for students with disabilities, particularly those with ADHD and LDs.

### Measures

#### Career Thoughts

**Inventory** (CTI; Sampson, Peterson, Lenz, Reardon, & Saunders, 1996). The CTI consists of 48 Likert-scale items, each representing a dysfunctional career-related thought. Respondents identify their level of agreement with each statement, with response options ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). The total score is intended to provide a global evaluation of negative/dysfunctional career thoughts. The developers "identified three cluster areas of dysfunctional thinking: (a) decision-making confusion (DMC), the inability to initiate

or sustain the career decision-making process due to disabling emotions and/or limited understanding; (b) commitment anxiety (CA), the inability to commit to a career choice because of anxiety about the anticipated outcome; and (c) external conflict (EC), the inability to balance self-perception with input from significant others, translating into a reluctance to assume independence and/or responsibility for career decision making.” (Sampson et al., 2004, p. 92). Evidence of dysfunctional career thoughts can be found in one, two, or all three cluster areas. Research has supported the reliability of the CTI for students with and without LD. Dipeolu et al (2012) found further support for the reliability of the CTI with students with LDs, with an alpha coefficient of 0.95 for the CTI total score, and coefficients of 0.89, 0.80, and 0.75 for the DMC, CA, and EC subscales, respectively. Reported total score test-retest reliability for a four week period was 0.89 for the non-LD college sample and 0.69 for a sample of high school students without disabilities (Sampson et al., 1996). The internal consistency for a sample of undergraduate college students without LD was comparable to that of those with LDs (Dipeolu, 1997; Dipeolu, Reardon, Sampson, & Buckhead, 2002). According to Vernick (2002), several studies have found CTI to be a stable and valid instrument for use during the career counseling process for non-LD populations. Additionally, Dipeolu et al (2013) found support for reliability of this measure with ADHD students, with alpha coefficients of 0.96, 0.88, 0.85, and 0.74 for CTI total, DMC, CA, and EC subscales respectively.

### Career Maturity

**Inventory – Revised (CMI-R;** Crites & Savickas, 1996). The CMI-R assesses level of career maturity, which is critical in an individual’s ability to make realistic career decisions (Busacca & Taber, 2002). The instrument provides three scores: Attitudes (CMI-Att), Competency (CMI-Com), and Career Maturity Total (). The CMI-R utilizes a dichotomous response format (*agree/disagree*) and is comprised of 50 items. Half of the items (25) tap into the attitudinal/affective domain (CMI-Att) and half assess the cognitive/competency domain (CMI-Com). The CMI-Tal provides a global assessment of career maturity, with higher scores indicating a higher level of maturity. Studies have generally supported the reliability and validity of the CMI-R (Busacca & Taber, 2002). For students with LDs, reliability coefficients have been moderately strong. Dipeolu (2007) found coefficients ranging from 0.69 (CMI-Com) to 0.80 (CMI-Tal). Additionally, Dipeolu, et al (2012) found moderately strong reliability estimates among students with LDs (0.77 for the CMI-Tal, 0.74 for the CMI-Att, and 0.71 for the CMI-Com). Dipeolu, et al (2013) found a reliability estimate of 0.54 for CMI-Att with an ADHD student sample.

Jepsen and Prediger (1981) reported a convergent validity correlation of 0.37 with the Career Development Inventory (Super, Thompson, Lindeman, Jordaan, & Myers, 1981), a measure of career maturity. Bathory (1967) reported a criterion validity correlation of 0.39 with the Occupational Aspiration Scale (Miller & Haller, 1964). Busacca and Taber (2002) assumed that the current version of the CMI has similar validity and reliability as the 1978 version.

### Vocational Identity (VI;

Holland, Daiger, & Power, 1980). The VI is comprised of 18 items intended to evaluate a person’s vocational identity, which refers to a sense of clarity regarding one’s personality, talents, interests, and goals (Holland et al., 1980). The VI utilizes a dichotomous, true/false response format with the score obtained by summing the number of false responses. Higher scores indicate a well-developed vocational identity. The developers assert that strong vocational identity is typified by consistent career-related decision-making despite unavoidable uncertainty in one’s environment (Holland et al., 1980).

Holland et al (1980) reported internal consistency reliability coefficients of 0.86 for both male and female high school students. Additionally, among a sample of workers and college students, a KR-20 coefficient of 0.88 was obtained for women, while the coefficient for men was 0.89. Among students with LDs, Dipeolu et al (2012) found a KR-20 coefficient of 0.82, and a KR-20 coefficient of 0.86 among students with ADHD (Dipeolu et al., 2013). The instrument developers also provide support for the construct validity of the VI (Holland et al., 1980).

For the purposes of this study, results of the VI scale were divided into profile scores consisting of High, Moderate, and Low levels of vocational identity. Other studies have used a similar profile or clustering approach (Crews, 2006; Johnson, Smither & Holland, 1981; Mauer & Gysbers, 1990; Wanberg & Muchinsky, 1992). This analytical approach is designed to assist with the application of the instrument, to provide clarity for scholars, and practitioners’ interpretations of student scores (Osipow, 1999).

**Results**

The VI scores were categorized into High, Moderate, and Low groups using the K-Means Cluster Classification procedure in SPSS. This allowed for interpretation of the pairwise results, as well as the interaction results of the study. After four iterations, a stable set of three clusters was established with 76 in Cluster 1, 58 in Cluster 2, and 112 in Cluster 3. Based on the values for each cluster center, the clusters were interpreted and labeled as follows: Cluster 1 was labeled High, Cluster 2 was labeled Low, and Cluster 3 was labeled Moderate. Mean scores (SD) were equal to the Cluster Centers for each of the three levels, High mean 15.54 (1.83) range = 6.00, Low mean 3.98 (1.93) range = 6.00, and Moderate mean 9.05 (1.62) range = 5.00. Results of the cluster analysis were saved as standardized variables in the data set and used for subsequent analyses.

The correlations between the CMI and CTI subscales were calculated (Table 1), and although the measures were found to be highly correlated, it was determined that each subscale provided information specific to different areas of function. Thus, the DMC subscale was related to, but distinct from, the CA subscale as intended within the CTI instrument. The distinctive subscale scores were developed to provide the best vantage point possible to begin intervention within the client population and need to be individually examined (Sampson et al., 1996).

Four univariate ANOVA analyses were performed using each of the dependent variables: CMI-Att score, CTI DMC T-score, CTI CA T-score, and CTI EC T-score. These were based on locally derived norms for either LDs or ADHD.

Independent variables used in each of the analyses were Group (LDs and ADHD) and Levels of VI (High, Moderate, and Low). SPSS GLM was used for the analysis and the data met the sampling, distribution and variation assumptions of the ANOVA analysis. (Tabachnick & Fidel, 2001; Mertler & Vannatta, 2002). As suggested by Grove and Andreasen (1982) and Bender and Lange (2001), an exploratory study in mental health/epidemiology should focus on avoiding a Type II error, rather than avoiding a Type I error. This helps to develop hypotheses that can be tested in greater detail later, and suggests that adjust-

results were calculated, with DMC Mean Difference = /3.05/ (1.42), (/ .26/, /5.84/), and Cohen's  $d = 3.04$ ,  $r^2 = .71$  and CMI-Att Mean Difference = /1.00/ (.46), (/ .10/, /1.90/), and Cohen's  $d = 3.09$ ,  $r^2 = .71$ . (See Tables 2, 3, 4 & 5 for complete ANOVA results). For these two constructs (DMC and CMI-Att), higher scores were found for participants with diagnosis of LDs than for students with ADHD.

Results for the second hypothesis related to differences in the constructs based on levels of VI in the participants, and all of the analyses provided significant results. Results for the four ANOVA analyses

Table 1.

*Correlations of CMI-R and CTI Subscales*

|                | CTI-DMC Tscore | CTI-CA Tscore | CTI-EC Tscore |
|----------------|----------------|---------------|---------------|
| CTI-DMC Tscore |                |               |               |
| CTI-CA Tscore  | .76**          |               |               |
| CTI-EC Tscore  | .67**          | .56**         |               |
| CMI-Att score  | -.50**         | -.43**        | -.41**        |

Note. CTI-DMC = Career Thoughts Inventory-Decision Making Confusion; CTI-CA = Career Thoughts Inventory-Commitment Anxiety; CTI-EC = Career Thoughts Inventory-External Conflict; CMI-Att = Career Maturity Inventory-Attitude  
 \*\* correlation is significant at the 0.01 level (2-tailed).

ing for the alpha level error rate is unnecessary in an exploratory study such as this one.

Results of the analysis were mixed. With regard to Hypothesis 1 (related to differences between the two diagnostic categories), two constructs demonstrated significant differences and two did not. Specifically, there were differences between the LDs and ADHD groups on the DMC subscale,  $F(1,247)=4.62$ ,  $p=.03$ , and the CMI-Att subscale,  $F(1, 241) =4.77$ ,  $p=.03$ . Mean difference (Standard Error), (95% Confidence Interval LB and UB) and effect size for these two significant

were: DMC  $F(2,247)=34.96$ ,  $p<.01$ ; CA  $F(2,247)=29.37$ ,  $p<.01$ ; EC  $F(2, 247)=27.28$ ,  $p<.01$ ; and CMI-Att  $F(2,241)=28.24$ ,  $p<.01$ . Additional post-hoc analysis revealed significant mean differences in DMC across all VI comparisons, significant mean differences in CA across all VI comparisons, significant mean differences in both EC and CMI-Att between High-Low, High-Moderate, and Low-High comparisons but non-significant differences in Low-Moderate comparisons (See Tables 2, 3, 4 & 5).

Further exploration of multiple comparisons of each dependent

Table 2

Univariate ANOVA for Decision Making Confusion Scores normed for Group Diagnosis

| Variables        | Type III Sum of Squares | df  | Mean Square | F       | Sig.  | Partial Eta Squared | Observed Power |
|------------------|-------------------------|-----|-------------|---------|-------|---------------------|----------------|
| Corrected Model  | 9607.16                 | 5   | 1921.43     | 16.58   | .000* | .25                 | 1.00           |
| Intercept        | 537437.70               | 1   | 537437.70   | 4636.53 | .000* | .95                 | 1.00           |
| Group            | 535.52                  | 1   | 535.52      | 4.62    | .033* | .02                 | .57            |
| VI               | 8104.59                 | 2   | 4052.29     | 34.96   | .000* | .22                 | 1.00           |
| Group * VI Level | 385.48                  | 2   | 192.74      | 1.66    | .192  | .01                 | .35            |
| Error            | 28630.70                | 247 | 115.91      |         |       |                     |                |

Note. VI = Vocational Identity  
\* significant at the 0.05 level

variable at each level of VI was undertaken in order to more fully understand the relationships between the levels of VI and the dependent variables. A post-hoc Tukey analysis identified the significant differences and provided 95% confidence intervals for the sample (Table 6). Regarding the third hypothesis, no significant interactions were identified for any of the dependent variables based on LDs/ADHD diagnosis and VI levels.

**Discussion**

It was hypothesized that there would be a significant difference in the way students with ADHD and LDs responded on these constructs. We also hypothesized that there would be a significant differences by levels of VI (High, Moderate, and Low) and that there would be significant interactions between groups and VI levels. Results for the hypotheses were mixed.

When each of the four dependent variables were analyzed, significant differences were found on two of the dependent variables (CMI-Att and DMC) for the LDs

Table 3

Univariate ANOVA for Commitment Anxiety Scores normed for Group Diagnosis

| Variables        | Type III Sum of Squares | df  | Mean Square | F       | Sig.  | Partial Eta Squared | Observed Power |
|------------------|-------------------------|-----|-------------|---------|-------|---------------------|----------------|
| Corrected Model  | 6579.30                 | 5   | 1315.86     | 12.56   | .000* | .20                 | 1.00           |
| Intercept        | 560838.75               | 1   | 560838.75   | 5355.04 | .000* | .95                 | 1.00           |
| Group            | 104.52                  | 1   | 104.52      | 1.00    | .319  | .00                 | .17            |
| VI               | 6150.78                 | 2   | 3075.39     | 29.37   | .000* | .192                | 1.00           |
| Group * VI Level | 114.89                  | 2   | 57.45       | 0.55    | .579  | .00                 | .14            |
| Error            | 25868.56                | 247 | 104.73      |         |       |                     |                |

Note. VI= Vocational Identity  
\* significant at the 0.05 level

and ADHD groups. Higher scores on the DMC can be interpreted as problematic, in that a student with a high DMC score demonstrates more decision-making confusion in his/her score pattern. Alternatively, higher scores on the CMI-Att scale identify a more positive attitude or

more career readiness. The results identified that scores on the CMI-Att and DMC scales were significantly different between these two diagnostic groups. The significantly lower scores for the ADHD sample on the CMI-Att scale suggests a relative lack of readiness to make career decisions. This may be related to the ADHD students' lower threshold for attention and potentially lower confidence in making career development decisions. The higher scores on the DMC subscale by the LDs group indicate that professionals may need to examine career decision-making confusion when working with this group. As Szymanski (1993) noted, disabilities may limit opportunities

to learn and practice decision-making skills. Hence, it is strongly recommended that interventions focus on the process of career decision-making in order to adequately address the career development needs of these youth. Additionally, LDs students may be more sensitive to the limitations of their disability in their career aspirations, leading them to identify more barriers, and experience more confusion during the career development process.

Opportunities that remove barriers to career decision-making should be promoted for students with LDs. Professionals should explore emotions related to having a disorder and how these may impact

Table 4

Univariate ANOVA for External Conflict Scores normed for Group Diagnosis

| Variables        | Type III Sum of Squares | df  | Mean Square | F       | Sig.  | Partial Eta Squared | Observed Power |
|------------------|-------------------------|-----|-------------|---------|-------|---------------------|----------------|
| Corrected Model  | 7039.15                 | 5   | 1407.83     | 12.20   | .000* | .20                 | 1.00           |
| Intercept        | 545186.79               | 1   | 545186.79   | 4725.40 | .000* | .95                 | 1.00           |
| Group            | 201.61                  | 1   | 201.61      | 1.75    | .187  | .01                 | .26            |
| VI               | 6295.49                 | 2   | 3147.74     | 27.28   | .000* | .18                 | 1.00           |
| Group * VI Level | 162.16                  | 2   | 81.08       | .703    | .496  | .01                 | .17            |
| Error            | 28497.33                | 247 | 115.37      |         |       |                     |                |

Note. VI = Vocational Identity  
\* significant at the 0.05 level

Table 5

Univariate ANOVA for Career Maturity Inventory – Attitude Subscale

| Variables        | Type III Sum of Squares | df  | Mean Square | F       | Sig.  | Partial Eta Squared | Observed Power |
|------------------|-------------------------|-----|-------------|---------|-------|---------------------|----------------|
| Corrected Model  | 718.75                  | 5   | 143.75      | 12.19   | .000* | .20                 | 1.00           |
| Intercept        | 50881.72                | 1   | 50881.72    | 4315.34 | .000* | .95                 | 1.00           |
| Group            | 56.24                   | 1   | 56.24       | 4.77    | .030* | .02                 | .59            |
| VI               | 665.95                  | 2   | 332.97      | 28.24   | .000* | .19                 | 1.00           |
| Group * VI Level | 8.13                    | 3   | 4.07        | .35     | .709  | .00                 | .11            |
| Error            | 2841.61                 | 241 | 11.79       |         |       |                     |                |

Note. VI = Vocational Identity  
\* significant at the 0.05 level

career decision-making, as problem-solving deficits are commonly associated with ADHD and should be specifically addressed (Dipeolu & Keating, 2010; Weyandt, 2001). Appropriate skills and a positive attitude for the decision-making process are prerequisites to making a healthy career choice (Patton & Creed, 2007b). By addressing these deficits, youth with LDs and ADHD can be prepared to appropriately meet decision-making and readiness challenges related to career.

When High versus Low levels of VI were examined, significant differences were found in all four dependent variables. This suggests that a student's level of VI has a moderating effect on her/his responses regarding DMC, CA, EC and CMI-Att. A strong VI allows a young person to find methods to alleviate confusion, anxiety and conflict in order to achieve the desired identity. Alternatively, those with lower levels of VI are more susceptible to decision-making confusion, commitment anxiety and external influence. More readiness for career decisions, as measured by the CMI-Att scale, is associated with stronger levels of VI. When the Moderate versus Low levels of VI were examined, significant differences were found only in two of the dependent variables: DMC and CA. Given the constructs involved, decision-making confusion and commitment anxiety can be considered largely

internal, whereas the environment heavily influences EC.

Youth with Moderate levels of VI may have only begun to focus on the internal components (i.e., DMC and CA) of career development and have not yet focused on the external influences (i.e., EC) to career decisions. Similarly, those with Moderate levels of VI would likely demonstrate moderate readiness for career decision-making as measured by the CMI-Att. It is possible that the levels of VI may represent stages in career development similar to other stages in developmental theories, as higher

VI is associated with more positive outcomes on the dependent variable constructs than lower VI. If we take the correlations into consideration, it is clear that higher levels of DMC, CA and EC are associated with lower levels of readiness to make career decisions, and vice versa. CTI subscale scores (DMC, CA, and EC) and the CMI-Att were significantly related to High and Low VI scores, which also confirms the results from previous studies (Dipeolu et al., 2013; Dipeolu et al., 2012; Saunders, Peterson, Sampson, & Reardon, 2000). The results of this research support the predictability of the Low and High VI levels from the CTI subscales and the CMI-Att subscales.

It was also hypothesized that there would be significant interactions between groups and VI levels. No significant results were found in this study. This may be related to the low numbers of participants in each group once divided into the three levels of VI and two groups of

Table 6

Tukey HSD Multiple Comparisons for VI score Independent Variable and DVs

| Multiple Comparisons | Vocational Identity Level Comparisons |                 |            |                |                 |                |
|----------------------|---------------------------------------|-----------------|------------|----------------|-----------------|----------------|
|                      | High – Low                            | High – Moderate | Low – High | Low – Moderate | Moderate – High | Moderate – Low |
| CTI-DMC Tscore       |                                       |                 |            |                |                 |                |
| Mean Diff            | -15.49*                               | -9.01*          | 15.49*     | 6.48*          | 9.01*           | -6.48*         |
| St Error             | 1.86                                  | 1.58            | 1.86       | 1.72           | 1.58            | 1.72           |
| 95% CI Lower         | -19.87                                | -12.72          | 11.11      | 2.42           | 5.29            | -10.54         |
| 95% CI Upper         | -11.11                                | -5.29           | 19.87      | 10.54          | 12.72           | -2.42          |
| CTI-CA Tscore        |                                       |                 |            |                |                 |                |
| Mean Diff            | -13.11*                               | -8.58*          | 13.11*     | 4.53*          | 8.58*           | -4.53*         |
| St Error             | 1.77                                  | 1.50            | 1.77       | 1.64           | 1.50            | 1.64           |
| 95% CI Lower         | -17.27                                | -12.11          | 8.95       | 0.67           | 5.04            | -8.39          |
| 95% CI Upper         | -8.95                                 | -5.04           | 17.27      | 8.39           | 12.11           | -0.67          |
| CTI-EC Tscore        |                                       |                 |            |                |                 |                |
| Mean Diff            | -12.68*                               | -9.77*          | 12.68*     | 2.91           | 9.77*           | -2.91          |
| St Error             | 1.85                                  | 1.57            | 1.85       | 1.72           | 1.57            | 1.72           |
| 95% CI Lower         | -17.05                                | -13.48          | 8.31       | -1.14          | 6.06            | -6.96          |
| 95% CI Upper         | -8.31                                 | -6.06           | 17.05      | 6.96           | 13.48           | 1.14           |
| CMI-Att Score        |                                       |                 |            |                |                 |                |
| Mean Diff            | 4.17*                                 | 2.86*           | -4.17*     | -1.31          | -2.86*          | 1.31           |
| St Error             | 0.60                                  | 0.51            | 0.60       | 0.55           | 0.51            | 0.55           |
| 95% CI Lower         | 2.75                                  | 1.66            | -5.58      | -2.62          | -4.06           | -0.00          |
| 95% CI Upper         | 5.58                                  | 4.06            | -2.75      | 0.00           | -1.66           | 2.62           |

Note. CTI-DMC = Career Thoughts Inventory-Decision Making Confusion; CTI-CA = Career Thoughts Inventory-Commitment Anxiety; CTI-EC = Career Thoughts Inventory-External Conflict; CMI-Att = Career Maturity Inventory-Attitude

\* indicates significant at the .05 level

diagnosis. Post-hoc observed power in the univariate ANOVA analyses, ranging from 0.11 to 0.35, supported this possibility. Larger sample sizes will provide greater power for subsequent exploration of this interaction.

### Implications, Limitations and Future Research

The data from the present study contains implications for understanding the career development unique to youth with ADHD and LDs, providing opportunities to apply evidence-based interventions from a strength-based approach. Previous studies have supported the need to develop norms based on local samples when utilizing career development instruments (Dipeolu et al., 2013; Dipeolu et al., 2012; Dipeolu, 2007; Sampson et al., 1996; 2004). Perhaps re-norming the instruments using a representative sample of students with LDs (Dipeolu, 2007; Dipeolu et al., 2012) and ADHD (Dipeolu et al., 2013) will allow practitioners to better understand subtle changes in students' scores related to each diagnosis. These results suggest that developing representative norms based on disability classification will be beneficial when utilizing career development instruments. Continuously examining the use of local norms to provide better information for researchers and practitioners can enhance the usage of these instruments.

The use of multiple-method assessments in addressing the career development of adolescents with ADHD and LDs is preferable to a single score approach. This approach best captures the multiple elements that influence career decisions. Empirical studies support the practice of multiple-method

assessment batteries to obtain a comprehensive picture of each client (Meyer Finn, Eyde, Kay, Moreland, & Dies, 2001). Ultimately, a multi-pronged approach can help students by promoting the inclusion of a variety of characteristics (Power, 2006) and facilitate a more holistic view (Whiston & Quinby, 2009). Students with ADHD and LDs often bring a myriad of career concerns compounded by disability-related issues to the process of career counseling (Dipeolu, et al., 2013). Hood and Johnson (2007) recommended combining different types of assessment data to maximize the strengths and minimize the limitations. This approach places strengths and weaknesses on the same continuum to help individualize the chosen interventions. The combined use of career development instruments can increase the amount of knowledge extracted, enhancing the overall career decision-making process (Dipeolu, et al., 2013; Meyer et al., 2001; Whiston & Quinby, 2009) for young adults.

This study has some limitations, beginning with sample size. The data set is relatively small for norming the scales involved. However, it is important to note that the size of this sample does approach the size used in the standardization of these scales. Additionally, the sample in this study was derived from the public school system and not from a clinical population. Hence, there was limitation in accessing information about different subtypes of ADHD and length of diagnosis. Research suggests that 25% of individuals diagnosed with ADHD also have an accompanying diagnosis of an LD (American Psychiatric Association, 2013; Barkley, 2006; Weyandt, 2001). Further research on the differences in career development between students with

ADHD and LDs should include clinical samples in which this information is accessible, along with the identification of any co-morbid conditions.

Continued research with youth with disabilities has the potential to maximize future employment possibilities for this population, as well as expand the practice of professionals working with these individuals. Future studies should incorporate a methodology that would move research beyond the participants' stage of development, thereby expanding the understanding of career maturity to include that of career adaptability (Savickas, 2002). For example, the use of a structured interview and developmentally-focused measures of VI may provide new insights into working with this population (Skorikov & Vondracek, 2007). Investigation of the post-school transition needs unique to youths with ADHD and LDs can also provide necessary information for developing individualized, evidence-based career development and post-school transition interventions. More importantly, this allows for the use of strength-based models with attention to optimal levels of development for students with disabilities, emphasizing resilience and empowerment (Kenny, Waldo, Warter, & Barton, 2002). Utilizing strength-based, developmental and preventive approaches, while paying careful attention to the differences and similarities in these diagnoses, can maximize the effectiveness of interventions to reduce dysfunctional career thoughts, strengthen vocational identity, and foster resilience along students' career paths.

The findings and constructs explored in this study suggest that exploring VI as a developmental process may provide insight into decision-making confusion, commit-



ment anxiety, and external conflict as well as readiness to make career decision. Traditionally, VI is conceptualized as a unitary construct and not as a developmental process. These findings confirm the suggestion of Skorikov and Vondracek (2007) that VI is best conceptualized within a developmental model. This re-conceptualization allows for further examination of how development of a strong VI influences other career development constructs. Future research may provide additional understanding of the significant relationships found between the VI scores and the dependent variables in this study.

### Conclusion

Work fulfills an important rite of passage for adolescents with disabilities. It provides a sense of challenge, instills a sense of identity and purpose, and enhances personal growth, while helping to establish financial independence. Given the high unemployment and the distinctive transition needs of youth with disabilities (Blustein, 2008), empirically derived understanding and individualized interventions are crucial to help youth navigate the transition from young adulthood into the adult world of work. With attention to the unique vocational needs of adolescents with ADHD and LDs, informed practitioners may have greater success in helping these students attain desired vocational and career goals.

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