The Use and Development of the Career Thoughts Inventory

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Introduction

The Career Thoughts Inventory (CTI; Sampson, Peterson, Lenz, Reardon, & Saunders, 1996; 1998) is a theory-based assessment and intervention resource intended to improve the quality of career decisions made by adults, college students, and high school students and the quality of career services delivered to these individuals. The CTI is a self-administered, objectively scored measure of dysfunctional thinking in career problem solving and decision

making. The CTI and "Improving Your Career Thoughts: A Workbook for the Career Thoughts Inventory" (the CTI Workbook; Sampson, Peterson, Lenz, Reardon, & Saunders, 1996) are based on a ***cognitive information processing*** (CIP) theoretical approach to career development and career services (Peterson, Sampson, & Reardon, 1991; Peterson, Sampson, Reardon, & Lenz, 1996) and a ***cognitive therapy*** theoretical approach to mental health and mental health services (Beck, 1976; Beck, et al., 1979; 1985).

The CTI was developed to integrate the functions of assessment and intervention within a career service delivery context. The goal was to link the measure and the accompanying workbook in such a way that clients might make more efficient use of their time and their human service practitioner's time, while more effectively incorporating the assessment concepts into intervention strategies for change. As a result, the CTI is comprised of traditional assessment components (CTI Test Booklet and Professional Manual) plus a learning resource (the CTI Workbook).

Cognitive Information Processing theory postulates that effective career problem solving and decision making requires the effective processing of information in the following four domains:
1) Self-Knowledge includes individuals' perceptions of their values, interests, skills, etc.
2) Occupational Knowledge includes knowledge of individual occupations and having a schema for how the world of work is organized.
3) Decision Making Skills are the generic information processing skills that individuals use to solve problems and make decisions, including the subcomponents of *communication*, *analysis*, *synthesis*, *valuing*, and *execution*.
**** Communication***: Individuals become aware that a gap exists between an existing and a desired state of affairs as a result of one or more external cues (positive or negative events or input from one or more significant others) or internal cues (client perceptions of negative emotions, avoidance behavior, or physiological changes).
**** Analysis***: Individuals form a mental model of the problem and perceive relationships among the components, e.g., relating self-knowledge with occupational knowledge to better understand the necessary characteristics of the occupation or other option they seek.
**** Synthesis***: Individuals expand (elaborate) and then narrow (crystallize) the alternatives that they are considering.
**** Valuing***: Individuals evaluate the costs and benefits of each of the remaining alternatives to themselves, significant others, their cultural group, and their community or society in general, ultimately leading to a first choice.
**** Execution***: Individuals formulate and commit to a plan for implementing their tentative choice, including a preparation program, reality testing, and employment seeking.
4) Executive Processing includes metacognitions which control the selection and sequencing of cognitive strategies used to solve a career problem through self-talk, self-awareness, and control and monitoring.

In order to simplify the process of instrument development, the above domains and subcomponents were organized into eight cognitive information processing (CIP) ***content dimensions*** that include:

1) Self-Knowledge
2) Occupational Knowledge
3) Communication
4) Analysis
5) Synthesis
6) Valuing
7) Execution
8) Executive Processing

Dysfunctional thinking in any of the above CIP eight content dimensions could impair an individual's ability to solve career problems and to make career decisions. For the purposes of this instrument, the terms thinking and information processing are used synonymously.

Cognitive therapy theoretical concepts (Beck, 1976; Beck, et al., 1979; 1985) specify that dysfunctional cognitions have a detrimental impact on behavior and emotions. Through cognitive restructuring, collaborative empiricism, attention to emotions, and the development of an effective helping relationship, clients learn to replace dysfunctional cognitions with functional cognitions, resulting in positive changes in behavior and emotions.

In developing the CTI, the following assumption was made:

> While dysfunctional thinking in career problem solving and decision making cannot be measured directly, it can be inferred from an individual's endorsement of statements (test items) reflecting a variety of dysfunctional career thoughts.

For the purposes of this instrument, ***career thoughts*** are defined as

> outcomes of one's thinking about assumptions, attitudes, behaviors, beliefs, feelings, plans, and/or strategies related to career problem solving and decision making.

Regardless of whether CTI items refer to assumptions, attitudes, behaviors, beliefs, feelings, plans, and/or strategies, all items reflect dysfunctional thinking that inhibits effective career problem solving and decision making.

Appropriate Populations for the CTI

The CTI is designed for the following individuals: (a) eleventh- and twelfth grade ***high school students*** who may be choosing a postsecondary field of study, choosing an occupation, or seeking employment; (b) ***college students*** who may be choosing a major field of study, choosing an occupation, or seeking employment; and (c) ***adults*** who are considering an occupational or employment change, seeking employment due to unemployment or underemployment, or reentering the labor market after a substantial period of nonpaid work (such as child rearing).

Using the Harris-Jacobson Wide Range Readability Formula (Harris & Jacobson, 1982), the readability of the CTI and the CTI Workbook was calculated to be at a 6.4 and 7.7 grade level, respectively. Given this finding, the CTI and CTI Workbook can be used without assistance with most high school and college students and adults.

Administering and Scoring the CTI

In order to facilitate quick completion, scoring, and profiling of the instrument and avoid unnecessary delays or disruptions in the service delivery process, the CTI combines the inventory, answer sheet, and profile form into one booklet. The Test Booklet can be quickly scored by clients, human service practitioners, or clerical support staff. The CTI Profile is printed on the back page of the booklet.

Use of the CTI and the CTI Workbook

In service delivery, the CTI can be used by practitioners to help adults, college students, and high school students identify, challenge, and subsequently alter dysfunctional thinking that impairs their ability to effectively solve career problems and make career decisions. Specifically, the CTI can be used as an instrument for screening and needs assessment, as well as a learning resource in delivering career services. The CTI Professional Manual provides additional details on the use of the CTI and CTI Workbook, including specific strategies for individual counseling, group counseling, self-directed career decision making, workshops and curricular interventions.

Screening

As a screening measure, the CTI can be used to identify individuals who are likely to experience problems in making career choices as a result of their dysfunctional thinking. Individuals identified as having more dysfunctional thoughts will likely require more assistance in making effective use of career services, whereas individuals identified with fewer dysfunctional thoughts will require less assistance. The CTI Workbook can be used to facilitate an individual's understanding of how much help he or she will likely need to make effective use of career services. The CTI Total score is a single global indicator of dysfunctional thinking in career problem solving and decision making.

Needs Assessment

As a needs assessment measure, the CTI can be used to identify the specific nature of dysfunctional thinking noted in the screening process. In problem-solving terms, the CTI is used to help define the problem space.

Career interventions to reduce career choice problems can then be recommended. The CTI Workbook can be used to facilitate an individual's understanding of the nature of his or her dysfunctional thoughts. Construct scores include: **Decision-Making Confusion**, **Commitment Anxiety**, and **External Conflict**.

Decision-Making Confusion (DMC) refers to the inability to initiate or sustain the decision making process as a result of disabling emotions and/or a lack of understanding about the decision making process itself.

The ***Commitment Anxiety*** (CA) scale reflects the inability to make a commitment to a specific career choice, accompanied by generalized anxiety about the outcome of the decision making process. This anxiety perpetuates indecision.

The ***External Conflict*** (EC) scale reflects the inability to balance the importance of one's own self-perceptions with the importance of input from significant others, resulting in a reluctance to assume responsibility for decision making.

Learning

As a learning resource, the CTI and the CTI Workbook can be used with various counseling interventions in assisting individuals to challenge and alter the specific dysfunctional thoughts identified as problematic in the prior needs assessment process. The primary cognitive restructuring schema (Beck et al., 1979) used throughout the workbook encourages individuals to ***identify***, ***challenge***, and ***alter*** any negative career thoughts and then follow up with ***action***. This schema is repeated at several key points in the workbook to reinforce client understanding of the cognitive restructuring process. By reducing dysfunctional career thinking, clients are more likely to effectively process information needed for exploration, problem solving, and decision making. By becoming more aware of the negative impact of dysfunctional thinking and by learning the process of cognitive restructuring, clients can become "freed up" to think in more creative, reality-based ways about their career choices. A theory-based decision-making checklist, included in the CTI Workbook, can indicate potentially useful areas for specific instruction in career decision making. The CTI and the CTI Workbook are designed to help clients make current career decisions as well as learn how to be better problem solvers in the future. The Workbook includes the following five sections:

Section 1. Identifying Your Total Amount of Negative Career Thoughts: The CTI Total Score. The first section is designed to help clients understand that as dysfunctional career thinking increases, the level of practitioner assistance likely needed to benefit from career services increases as well. The intended outcome of using this section is that clients will be more motivated to seek a level of service appropriate for their needs.

Section 2. Identifying the Nature of Your Negative Career Thoughts. The second section is designed to help clients gain insight into the development and maintenance of their dysfunctional thinking. The intended outcome of using this section is that clients will be more self-aware, more capable of monitoring and controlling cognitions, and more motivated to cognitively restructure negative career thoughts and take action to make career decisions.

Section 3. Challenging and Altering Your Negative Career Thoughts and Taking Action. The third section is designed to improve self-awareness of the detrimental impact of dysfunctional thinking on career problem solving and decision making, to improve client capacity to monitor and control negative self-talk, to facilitate the cognitive restructuring of negative career thoughts through completion of an exercise, and to facilitate the development of an Individual Action Plan (IAP) for using career resources and services. The intended outcome of using this section is that clients will reduce their dysfunctional career thinking and more effectively use career resources and services, ultimately leading to a more consistent reduction of dysfunctional thoughts and more appropriate career decisions.

Section 4. Improving Your Ability to Make Good Decisions. The fourth section is designed to enhance the present and future decision-making skills of clients through decision-making instruction. The intended outcome of using this section is that clients will be better able to assess and apply their skills in career problem solving and decision making.

Section 5. Making Good Use of Support from Other People. The fifth section is designed to help clients better understand how support resources can be used to their benefit in cognitive restructuring, career exploration, and decision making. The intended outcome of using this section is that clients will be more proactive, knowledgeable consumers in making effective use of available practitioners and significant others.

Use of Terminology

Although this paper and the CTI Professional Manual use the term "dysfunctional" career thoughts, all client materials use the term of "negative" career thoughts. In using the workbook with clients, we strongly recommend that practitioners use the term "negative" rather than "dysfunctional" when referring to thoughts or thinking that limit career problem solving and decision making.

Diversity Issues

Consideration of diversity issues are important in the effective use of the CTI and the CTI Workbook. The influence of group membership relating to age, disability, ethnicity, gender, race, sexual orientation, and socio-economic status on career thoughts can be an important environmental factor in career choice. Group membership may enhance career choice via networking and mentoring or it may constrain career choice via stereotyping and prejudice. The specific nature and consequences of these environmental factors on career choice will likely vary with group membership. As a result, the specific career thoughts of an individual are a product of individual experience, mediated by personal characteristics and by group membership in a cultural context.

It is difficult to develop an instrument that reflects differences in life experience between group cultures, and within subcultures of specific groups, that is brief enough to be hand scored for use as a screening tool in service delivery. The CTI was designed to measure career thoughts that tend to be common across groups. In developing the CTI, potential items that were significantly associated with gender or ethnicity were eliminated from the item pool. It is possible, however, to collaboratively use the CTI with the client to identify, challenge, and alter career thoughts of an individual from a specific group. The Professional Manual includes specific suggestions for dealing with diversity issues in interpreting the CTI and using the CTI Workbook.

Professional Requirements

A variety of practitioners may make effective use of the CTI. In addition to general training in human behavior, helping skills, and assessment, practitioners need training in career development, career service delivery, and cognitive-behavior therapy. In addition to general experience in the delivery of human services, practitioners need experience in the delivery of career services with appropriate supervision. In particular, practitioners using the CTI with clients should be familiar with the professional manual, personally complete all components of the CTI, and make use of appropriate supervision.

Development of the CTI and the CTI Workbook

CTI Item Selection and Scale Construction

A rational-empirical approach was used in developing the CTI. After reviewing the theoretical foundations of the CTI and the literature on dysfunctional thinking in career choice, criteria were developed for each of the eight CIP content dimensions. An initial pool of 248 items was then created based on actual client statements from the career counseling experience of the authors. After review by experienced career counselors for item clarity and realism, the pool was revised to 195 items and then reviewed by a six-member bias panel to identify and correct any bias related to ethnicity (African American, Hispanic American, Asian American), gender, disability, and age. The 195 item pool plus 13 randomly inserted items from the short form of the Marlowe-Crowne Social Desirability Scale (Reynolds, 1982) was administered to 320 volunteer undergraduate students. Eighty items were retained on the basis of their general psychometric quality, freedom from gender, ethnic, or social desirability bias, item-scale reliability, and content domain coverage. A principal components analysis with Varimax rotation from an administration of these 80 items with a new sample of 196 volunteer undergraduate students revealed three interpretable constructs that were associated with dysfunctional career thinking: **decision-making confusion**, **commitment anxiety**, and **external conflict**. Items could then be identified as relating to one of these three constructs as well as contributing to one of the eight CIP content dimensions. The 80 items were also administered to clients seeking services, allowing an analysis of the capacity of individual items to distinguish clients (n=68) from non-clients (n=196). A shortened 48-item version of the CTI was then derived on the basis of factor loadings,

contribution to scale separation, capacity to discriminate clients from non-clients, and content domain coverage. The 48 items were then administered to a new sample of 145 volunteer undergraduate students. A second principal components analysis with Varimax rotation revealed the same three interpretable constructs as above.

CTI Workbook Development and Pilot Testing

Workbook development began with the cognitive restructuring exercise in Section 3. In order to assist clients in challenging and altering their thoughts, reframing stimulus statements were written for each CTI item to show clients how negative thoughts interfere with their ability to make career decisions, and to provide information on making the best use of time spent on career decision making. Reframing stimulus statements include varying combinations of the following themes: (a) the difficulty often encountered by individuals making career choices; (b) the often inherent ambiguities in making career choices; (c) the importance of assuming personal responsibility for decision making while also considering input from significant others; (d) the importance of linking career choices with other life choices; (e) the identification of factors that make it more difficult to think clearly about career options; (f) the identification of absolute dichotomous thinking that interferes with career choice; (g) the assumption that improved decision-making and information-seeking skills can be learned; (h) the value of broad career exploration prior to final choice; (i) the value of using a variety of sources of information in career exploration; and (j) the value of obtaining assistance from a helping professional when individuals experience difficulty in career choice. The reframing stimulus statements were then examined for potential bias regarding ethnicity, gender, disability, and age. The exercise was pilot tested and subsequently revised for clarity. Interpretive and decision-making instruction sections were then added to the workbook.

Standardization

CTI normative data were collected for ***adults*** (n=571), ***college students*** (n=595), and eleventh- and twelfth grade ***high school students*** (n=396). Combined data on college student and adult clients (n=376) were also collected. In general, all groups were representative in terms of geographic distribution, gender, and ethnicity, with the exception that female adults were overrepresented, Hispanic American adults were underrepresented, and female clients were overrepresented. As stated previously, organizations and individuals are strongly encouraged to develop local CTI norms to allow more specific population comparisons. Analysis of normative data revealed that gender and ethnicity accounted for .2% and .1% of the variance, respectively, in CTI Total scores for all groups combined. Therefore, it was concluded that there is little relationship between gender or ethnicity with respect to CTI Total scores, and that there was no need to provide separate norms for either of these factors.

Reliability

Internal consistency. The internal consistency of the CTI Total score and construct scales was determined by calculating coefficient alphas for each of the respective norm groups. The internal consistency (alpha) coefficients for the CTI Total score ranged from .97 to .93. Alpha coefficients for the construct scales ranged from .94 to .74.

Stability. Stability concerns the extent to which individuals achieve the same CTI scores on two different occasions. The stability of the CTI Total score and construct scales was determined by having 73 volunteer college students and 48 volunteer eleventh- and twelfth grade high school students complete the CTI twice over a four week interval. Four-week test-retest stability coefficients for the CTI Total score was high ($\underline{r}$ = .86) for the college student sample, indicating little change in responses to the entire 48 items over the 4-week period. The stability coefficients for the construct scales ranged from .82 to .74, following a similar pattern as the data for internal consistency, with lower correlations for scales with fewer items. This pattern was also observed for the high school student sample, with the CTI Total at $\underline{r}$ = .69 and the construct scales ranging from .72 to .52, showing that adequate stability exists for the use of the instrument.

Validity

Content validity. Content validity concerns the congruence of CTI items, CIP content dimensions, and construct scales with the theoretical basis of the instrument. This congruence was built into the development strategy for the CTI items and scales. Individual items and construct scales are directly linked to CIP theory through content dimensions. CIP content dimensions (self-knowledge, occupational knowledge, communication, analysis, synthesis, valuing, execution, and executive processing) provided specific criteria for developing items. The CTI

Professional Manual groups all 48 CTI items by content dimension and includes the corresponding criterion number or numbers for each.

Construct validity. Construct validity is concerned with the extent to which clusters of empirically associated items that are conceptually consistent with the theory can be identified and reproduced across populations. Evidence of construct validity was established through a series of factor analyses. The constructs of ***decision-making confusion***, ***commitment anxiety***, and ***external conflict***, that were identified in two different samples during CTI development, were replicated for adults, college students, and eleventh- and twelfth-grade high school students based on normative data. The CTI Total score is highly correlated ($\underline{r}$ = .89 to .94) with DMC for all groups. These correlations, along with the large percentage of the variance accounted for by DMC (factor 1), suggests that a general predisposition toward dysfunctional thinking strongly influences subsequent specific aspects of dysfunctional career thinking, such as commitment anxiety. External conflict (EC) appears somewhat less related to general dysfunctional thinking, as represented by the lower correlation of EC with the CTI Total score and DMC. Correlations among construct scales, especially CA and EC, are distinctly lower for the client population than for non-client adults, college students, and high school students. CA and EC appear to be more distinct from DMC for clients than nonclients.

Given the magnitude of correlations among CTI factors observed above for adults, college students, and high school students, a Principal Components Analysis with oblique rotation was used to extract the factor structure of the instrument. A three-factor model was confirmed for the college population, the combined normative sample, and the client comparison group. A two-factor solution (decision-making confusion and external conflict) was the most interpretable solution for the adult sample, whereas a different two-factor solution (decision-making confusion and commitment anxiety) was most interpretable for high school students. Our interpretation of these findings is that for adult non-client populations who are almost all employed or not seeking employment, commitment anxiety is not an operative construct when a career problem does not exist, whereas confusion about decision making and external conflict with significant others (such as spouses) are operative. For high school non-client populations, external conflict with significant others (such as parents and caretakers) concerning career problems is not yet an issue, whereas confusion about decision making and anxiety about post-high school commitments yet to be made are operative. The three-factor solution, including decision-making confusion, commitment anxiety, and external conflict, was again reproduced for the client population, for which the CTI was designed. We concluded that the three-factor solution is the most appropriate model to use for the instrument as it is the most generalizable solution across all populations.

What these analyses reveal about the construct validity of the CTI is that there is a single powerful confusion entity that is pervasive in career problem solving and decision making. Beyond this, there are more specific issues related to one's anxiety about committing to a career choice and to potential conflict with significant others. Therefore, all three constructs may be viewed as indicators of the presence of dysfunctional thinking that constrains the cognitive system that undergirds career problem solving and decision making.

Convergent validity. Convergent validity is concerned with the extent to which the CTI Total score and construct scale scores correlate with other measures of similar constructs in a theoretically consistent direction. Convergent validity measures included the following:

- **My Vocational Situation** (Holland, Daiger, & Power, 1980a) Identity Scale and Occupational Information and Barriers categories;
- **The Career Decision Scale** (Osipow, Carney, Winer, Yanico, & Koschier, 1987) Certainty and Indecision Scales;
- **The Career Decision Profile** (Jones, 1988) Decidedness, Comfort, Self-Clarity, Knowledge about Occupations & Training, Decisiveness, and Career Choice Importance scales;
- **The NEO PI-R** (Costa & McCrae, 1992a) Neuroticism Domain, including the facets of: Anxiety, Angry Hostility, Depression, Self-Consciousness, Impulsiveness, and Vulnerability.

Evidence of convergent validity was established by administering the above measures to 50 adults, 152 college students, and 151 eleventh- and twelfth-grade high school students. All samples were representative in

terms of geographic distribution, gender, and ethnicity, with the exception that females slightly outnumbered males (56% to 44%) across all three groups and Hispanic American adults were underrepresented.

Across all three groups (adults, college students, and high school students), CTI scales were consistently inversely correlated with positive constructs such as vocational identity, certainty, and knowledge about occupations and training, and directly correlated with indecision. The CTI Total score was consistently directly correlated with neuroticism and vulnerability. Only career choice importance exhibited inconsistency in relationships across groups as was expected. Although CTI construct scales covaried directly with angry hostility, self-consciousness, and impulsiveness, the relatively low magnitude of the correlations have limited practical importance.

The following additional relationships were also noted. CTI scales for adults were consistently inversely correlated with comfort with choice, decidedness, and lack of information needs and positively correlated with anxiety. CTI scales for college students were consistently inversely correlated with comfort with choice and decisiveness, and correlated positively with depression for the CTI Total score. CTI scales for high school students were consistently inversely correlated with self-clarity.

Relationships between the CTI Total score and convergent variables were very similar to the relationships observed between DMC and the convergent variables. This is to be expected given the high correlation between the CTI Total score and the DMC scale. The number of correlations having practical significance (.50 to .75) were 32 for adults, 21 for college students, and 17 for high school students. This is also to be expected given the slightly lower alpha reliabilities for high school students and college students in comparison with adults. These lower reliability coefficients, combined with the lower alpha reliabilities from some CDP scales and small numbers of items in NEO facet scales, could explain the lower number of correlations between convergent variables and either CA or EC.

Criterion validity. Criterion validity is concerned with the extent to which the CTI accurately discriminates between persons seeking career services (clients) and persons not seeking career services (nonclients). Evidence of predictive validity was established by administering the CTI to 199 clients and 149 nonclients at two different universities. Both samples were representative in terms of geographic distribution and ethnicity, with the exception that females slightly outnumbered males and a greater proportion of clients were sophomores while a greater proportion of nonclients were seniors. Analysis of the data revealed significant differences in CTI Total and construct scales for each group, with clients having higher scores as predicted. Post-hoc CTI item-level comparisons revealed significant differences between clients and nonclients on 26 items, with clients scoring higher than nonclients on all 48 items.

Utility

The utility of a test concerns how well the test achieves its intended purpose within the constraints of "typical" practice. Many career service delivery organizations serve numerous clients. In this type of environment, an instrument used for screening, needs assessment, and learning is most cost-effective when it can be:

1) quickly administered,
2) rapidly scored,
3) easily interpreted,
4) easily integrated into counseling homework, and
5) inexpensively used.

The CTI was designed to meet the above criteria. ***Quick administration*** - most clients complete the 48 CTI items in 7 to 15 minutes. ***Rapid scoring*** - the CTI can be hand scored in 5 to 8 minutes. As a result, the CTI can be used as part of a brief intake procedure or during an initial session. ***Easy interpretation*** - the CTI includes a limited number of scales (the CTI Total score and three construct scales), which simplifies interpretation. The CTI Workbook presents interpretive information for all four scales with text, metaphors, and illustrations that practitioners can use to facilitate interpretation of CTI results. ***Easy integration*** - the CTI workbook has several components that can be assigned as homework, such as cognitive restructuring of negative thoughts, developing an individual action plan for using career resources and services, and learning about the decision-making process.

Inexpensive use - the CTI Test Booklet and the CTI Workbook are relatively inexpensive to purchase and the hand scoring feature eliminates scoring processing fees.

NOTE: Refer to the CTI Professional Manual for additional details on the development, standardization, and validation of the CTI. Further information on CTI development may be found in Sampson, J. P., Jr., Peterson, G. W., Lenz, J. G., Reardon, R. C., & Saunders, D. E. (1996). Negative thinking and career choice. In R. Feller & G. Walz (Eds.). Optimizing life transitions in turbulent times: Exploring work, learning and careers (pp. 323-330). Greensboro, NC: University of North Carolina at Greensboro, ERIC Clearinghouse on Counseling and Student Services.

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