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Research Article

Initial Validation of Career Thought Inventory (CTI) on University Students in Malaysia

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Abstract

This study aimed to determine the validity and reliability of the Career Thought Inventory (CTI) instrument among Undergraduate Students in Public Universities. The CTI test was developed based on Cognitive Information Processing (CIP) theory which measures constructs of career thinking dysfunction, decision-making confusion subscales, commitment anxiety subscales and external conflicts. A total of 42 undergraduate students were involved as study subjects. Study data were analyzed using SPSS version 22 software to determine construct validity and reliability coefficient values (Cronbach's Alpha). The results of the study found that, the validity of the CTI test construct and the decision-making confusion subscale, commitment anxiety subscale and external conflict were above values > .25. While the value of Cronbach's Alpha coefficient is .946 and the subscale value is .623 to .874. This study, tests showed the original CTI (English version) and CTI test version of Malay has good validity and reliability. CTI test the Malay version suitable for use on university student population for the purpose of identifying the malfunction of career thinking. Recommendations and follow -up studies are also discussed.

Keywords: *Career Thought Inventory, dysfunctional career thought, construct validity, reliability*

Introduction

The career readiness of university students is measured based on the career decision-making ability variable. These factors influence a person's self in terms of career development (Hirschi, et al., 2015; Sampson et al., 2013). Career readiness is also influenced by external factors which is family, social, economic, and organizational (Sampson et al., 2013). There are students who pursue a field of study not of their own choice but due to other factors such as parents, family members (Fan, et al., 2014; Sampson et al., 2013;), peer follow-up, qualifications and academic achievement at the secondary school level (Zalizan et.al. 2013). The ability to make career decisions is related to career thinking that involves feelings, thoughts, attitudes, and expected beliefs (Bullock-yowell et al., 2013). Negative career thinking is a dysfunctional individual thinking affecting career decision -making processes and problem-solving abilities (Hirschi, et al., 2017; Bertoch, et al., 2013). Past studies have found that undergraduate students in universities experience low and moderate career readiness (Mohd Izwan et al., 2019; Maznizam & Abdullah, 2013; Zalizan et al., 2013). Career readiness is a predictor factor to the ability and capability of higher education students in preparing themselves with systematic career

planning and exploration (Atta, et al., 2013). Career readiness can be measured using the Career Thoughts Inventory (CTI) instrument developed based on CIP theory (Sampson, et al., 1996).

Dysfunctional Career Thoughts

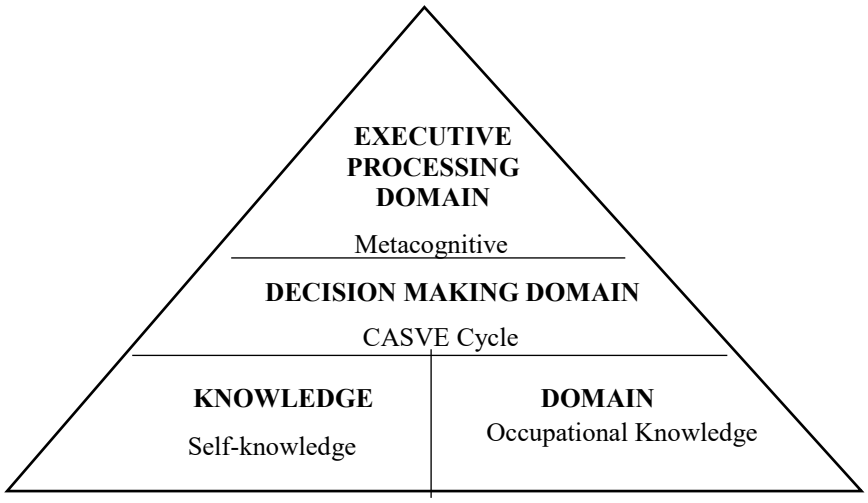
The Cognitive Information Processing (CIP) theory was introduced in the year of 1991 by Peterson, Sampson, and Reardon (Sampson, et al., 1996). This theory was based on the cognitive theory (Sampson et al., 1996) which are (i) problem solving and career decision making; (ii) understanding the positive and negative effects on the metacognitive in the context of problem solving and career decision making; and (iii) the basic concepts of interaction design in order to increase skills in problem solving and career decision making.

In the context of career development, career decision making is influenced by the past belief system be it positive or negative. Negative believes affect the information processing in career exploration and will also decrease job-obtaining behaviour (Reardon et al., 2006). The basic assumptions of this theory have it that the career problem solving is a rational process in the context of social emotion. Career problems are defined as the gap between the real self and ideal self. Negative career thoughts are defined as the product of an individual's thinking regarding the assumptions, attitude, behavior, belief, emotion, planning, or strategies related to problem solving and career decision making (Sampson et al., 2013). This gap produces negative thoughts that disturb or obstruct an individual in making decisions especially related to career decision. Rational process means an individual can define career through learning process (Brown, 2007; Peterson et al., 1996).

The CIP theory develops the basis of career thoughts dysfunctionality which consists of knowledge, decision making skill, and executive process. These three elements can define an individual's career readiness. According to Sampson et al. (1996) career thoughts dysfunctionality refers to the unstable characters of individuals from the perspective of psychology. These individuals tend to have unclear and unstable perceptions regarding their aims, interests, and talents as well as decision making. Concurrently, they are less confident regarding career choices and field of studies. Career decision making is a psychological development factor including the process of problem solving, cognitive, affective, and psychomotor that are modified towards chosen solution. The individuals integrate the knowledge about oneself and knowledge about career in making career decisions (Sampson, et al., 2004). Dysfunctional Career Thoughts (DCT) describes three psychology sub constructs which are Decision Making Confusion (DMC), Commitment Anxiety (CA) and External Conflicts (EC).

The DMC sub construct refers to an individual that is facing confusion with the issue of understanding decision making process due to negative emotions such as anxiety, depression, and giving up. Negative emotions will influence the rational problem-solving process and disturb the career decision making process. The CA sub construct refers to the inability of an individual to give commitment towards the chosen career choice. Every individual is often presented with multiple career choices simultaneously and they are needed to make a final decision based on available choices. In this situation, they are unable to let go of less suitable alternatives. Apart from that, they are also unable to let go of unsuitable choices. The EC sub construct refers to the inability of an individual to differentiate between own perception and the perception of others as an important input in the process of decision making. An individual with high external conflicts shows dependency towards significant others such as parents, family members, teachers, friends, and others in making career decisions. Past studies revealed that

DCT has relationships with other variables such as depression (Dieringer, et al., 2017); career self-efficacy (Hang Jo, et al., 2016); difficulty in decision making (Jukka, et al., 2016; Kleiman, et al., 2004; Sidiropoulou-Dimakakou et al., 2012), perfection (Andrews et al., 2014) and career interest (Bullock et al., 2013) and Their findings revealed that career thoughts dysfunctionality becomes an obstruction in the career decision making ability.



(Source from Career Development and Services: A Cognitive Approach by G.W.Peterson, J.P.Sampson, and R.C.Reardon. Copyright 1991 Brooks/Cole Publishing Company, Pacific Grove, CA 93950, a division of International Thompson Publishing Inc.).

Figure 1: Pyramid of Information Processing Domains

Figure 1, is the concept of the CIP pyramid, and the CASVE cycle can explain a treatment strategy in counseling and career guidance can be constructed by counselors in helping clients make career decisions. Bullock-yowell et al., (2013) stated the results of a study related to negative career thinking based on CIP theory showed that career decision making ability is influenced by career thinking. In the study suggested a career intervention program that focuses on restructuring negative career thinking should be implemented to those faced with such situations.

Method

The study design used was a descriptive study to determine the construct validity and reliability of the CTI. A total of 42 people was involved as a sample of the study consisting of undergraduate students who are currently studying. The instrument used was the CTI which contained 48 statements measuring constructs of career thinking dysfunction, subscales of decision -making confusion, commitment anxiety and external conflict. CTI test used in this study is the format that the Malay version was translated by Nur Liyana (2014) after obtaining permission by Psychological Assessment Resources (PAR) as the original owner of this testing tool.

The construct validity of a questionnaire was measured by using the correlation value between the score of each item with the total score concerned (Fraenkel et.al, 2012). The CTI test performed Pearson correlation analysis between the score of each item with the total score according to the relevant construct. This method is in line with the theory put forward by Nunnally (1978). According

to Abu Bakar (1995), the minimum and acceptable value of correlation coefficient is 0.30; Nunally (1978) as well as Nunally and Bernstein (1994) above 0.25 are considered high; and Cohen (1988), correlation coefficient values between 0.10 to 0.29 are considered small-scale, correlation coefficient values between 0.30 to 0.49 are considered moderate and correlation coefficient values between 0.50 to 1.00 are considered high.

A pilot study was conducted to obtain the reliability value of an instrument. Instrument reliability refers to the extent to which a measuring instrument has high reliability if the same score is obtained by the same individual by answering the same test at different times (Fraenkel et al. (2012). Reliability coefficient values above α .60 are often used as a reliability index instruments (Pallant, 2001; stating a value of reliability coefficient greater than .60 is often used. While Fraenkel et al. (2012) put the value of the acceptable reliability coefficient is α .70.

Instrument

The Career Thought Inventory (CTI) test was developed by Sampson, Peterson, Lenz, Reardon and Saunders in 1996 based on Cognitive Information Processing (CIP) theory. The CTI test measures the dysfunction of career thinking associated with five phases in the career decision making process which involved communication, analysis, synthesis, valuing, and execution. The CTI test contains 48 items and measures three subscales which are career Decision-Making Confusion (DMC), Commitment Anxiety (CA), and External Conflict (EC).

The sub-scale of career decision -making confusion refers to the inability to make and maintain a decision -making process due to weak emotions and lack of understanding related to decision -making. Examples of items are "I'll never understand myself well enough to make a good career choice". While the sub-scale of commitment anxiety refers to the inability to make a commitment to a particular career choice, as well as the existence of general anxiety about the expected outcome of decision -making. The anxiety that exists causes a person to be unable to make decisions. Examples of items are "I'm afraid I'm overlooking an occupation". While the external conflict subscale refers to the inability to balance the importance of self-perception with the importance of input from others, causing a person to refuse to take responsibility for decision making. Examples of items in this subscale are "I know what job I want, but someone's always putting obstacles in my way".(Sampson, et al., 1996).

According to Sampson et al. (1996), the development of the CTI test tool has gone through three phases. The first phase has reduced 80 items from 195 items. The second phase was 80 items administered to 196 undergraduate students taking an introductory course to psychology, Florida State University (FSU). The findings of the second phase study, showed the items were reduced to 48 items. Meanwhile, the third phase, CTI which had 48 items was administered to 145 samples of undergraduate students and the findings showed 48 items representing three subscales which are decision -making confusion, commitment anxiety and external conflict. The CTI test was tested on a population of adults, university students, and high school students. Content validity was conducted on CTI to determine consistency between CTI items. The CTI test is based on CIP theory which explains the content of the theory. The content included self-knowledge, job knowledge, communication, analysis, synthesis, evaluation, action and executive processing. The findings of the correlation analysis between CTI and CIP content dimensions are as follows in Table 1:

Table 1

Intercorrelation between CTI and CIP content dimensions

CIP Content	*CTI*	Decision Making Confusion (DMC)	Commitment Anxiety (CA)	External Conflict (EC)
Self-knowledge	.88	.81	.77	.71
Occupational knowledge	.87	.78	.75	.62
Communication	.92	.92	.78	.65
Analysis	.92	.97	.74	.64
Synthesis	.89	.86	.80	.62
Valuing	.87	.72	.87	.78
Execution	.85	.72	.73	.72
Metacognitive	.90	.81	.81	.66

(Source: Sampson, Peterson, Lenz, Reardon & Saunders. (1996) Career Thoughts Inventory: Professional Manual. Florida Ave. PAR).

Nur Liyana (2016) has made CTI test translation in English to Malay with the consent of Psychological Assessment Resources (PAR). Upon completion of the translation process, she has conducted content validation by obtaining expert consensus. Data were analyzed using item correlation values with overall items. Findings showed the overall CTI correlation value was r = .788, decision-making confusion r = .927, commitment anxiety r = .788, and external conflict r = .788.

The reliability of CTI was conducted on norm groups such as adults, college students, high school students and clients (Sampson et al., 1996). The internal consistency test showed that the Cronbach's Alpha value for the overall score was α .93 to .97. While for each construct of career decision-making confusion (DMC) is α .93 to .94, commitment anxiety (Commitment Anxiety -CA) α .79 to .91 and External Conflict (EC) α .74 to. 81. While stability analysis was conducted to identify the results of CTI scores were the same for two tests to the same sample. A total of 73 samples of undergraduate students were involved twice taking the CTI test over a four -week period. Findings showed the value of CTI coefficient was high (r = .86), the subscale of decision -making confusion was .82, commitment anxiety was .79 and external conflict was .74.

CTI test tool has been translated into English by Nur Ibrahim (2016). An analysis has been conducted for the reliability of form four high school students. The findings of her study showed the value of the overall CTI reliability coefficient was .903, decision -making confusion .875, commitment anxiety .801, and external conflict .758. Therefore, the validity and reliability of CTI test in Malay version has not been tested on the population of undergraduate students. This is because the original CTI test conducted validity and reliability analysis in a population of college students (Sampson et al., 1996; Sthrom, 2008).

Findings

Table 2 shows the correlation value of item score with total score and correlation value of corrected item with total score (Corrected Item-Total Correlation) for the subscale of decision-making confusion, commitment anxiety and external conflict are above .25. However, item 46 showed a value of <.25 but

the correlation value of the item score with the total score was still > .25. This indicates that the CTI test has an acceptable and good item correlation value. Based on the correlation value proposed by Cohen (1988), for the decision -making confusion subscale all items had item score correlation values with total score was high (r > .50), however items 3 and 4 had moderate correlation values (r = 0.30 to 0.49). Similarly, the commitment anxiety subscale showed that all items had an item correlation value with a high total score (r > .50), except for item 32 which had a moderate correlation value of r = .405. Meanwhile, the internal conflict subscale showed that items 6, 9, 14 and 23 had item correlation values with the total score was high (r> .05), except that item 46 was moderate which was r = .474.

Table 2 *Correlation values between items*

Sub scale	Item	Correlation of Item score with total score	Item correlation is corrected with total score
Decision Making Confusion (DMC)	1	.559	.475
	3	.426	.307
	4	.645	.576
	5	.713	.640
	11	.548	.447
	12	.752	.696
	13	.649	.576
	16	.760	.700
	20	.403	.314
	27	.722	.665
	28	.680	.593
	36	.699	.637
	43	.502	.417
	44	.606	.539
Commitment Anxiety (CA)	17	.800	.726
	21	.559	.448
	22	.731	.634
	26	.613	.494
	29	.790	.706
	30	.803	.715
	32	.405	.251
	38	.642	.562
	47	.616	.476
External Conflict (EC)	6	.745	.529
	9	.690	.488
	14	.635	.358
	23	.650	.447
	46	.474	.139

Based on Table 3, its show the value of CTI reliability coefficient was .946 followed by decision -making confusion subscale .874, commitment anxiety subscale .840 and internal conflict subscale

.623. Reliability analysis for CTI test, subscale of decision -making confusion, commitment anxiety and external conflict showed high coefficient values and this can explain this test is consistent and good.

Table 3 *Cronbach's alpha reliability coefficients for the CTI*

Instruments	Sub scale	Alpha Cronbach (α)
Career Thoughts Inventory (CTI)		.946
	Confusion of decision making	.874
	Commitment Anxiety	.840
	External conflict	.623

Discussion and Implications

The results of the study found that the validity of the CTI construct was good for all subscales which included decision -making confusion, commitment anxiety and external conflict. These findings are similar to test CTI original English version (Sampson, et al., 2013)) and Malay (Nur, 2016). This indicates that, the CTI test is suitable for application to university students and local culture.

The results of the reliability test found a high coefficient value of between α .623 - .946 in the university student population. The original test in the English version had an internal consistency between α .93 - .97 (Sampson, et al., 2006). While the Persian version of CTI also found that the test-retest found 0.93, DMC as 0.88 and 0.77, CA as 0.77 and 0.71, and EC as 0.59 and 0.65 (Muhammad Tehrani, et al., 2012). Similarly, the Malay version conducted on the population of high school students show the reliability coefficient is α .758 - .903 (Nurliyana, 2016). With the high internal consistency obtained in this study indicate the Malay version of CTI test is suitable for use on the population of university students.

This study, opens a new space in the field of assessment and measurement, especially career counseling of university students. Career counselors can use this test in designing career development programs either in the form of prevention or in the form of treatment. In addition, test results can be used in counseling sessions as an assessment tool for problem identification and treatment strategies. According to Reardon et al. (2013), stated that CTI test results can help counselors identify client problems and devise appropriate strategies for the problem -solving process.

Meanwhile, by focusing on the marketability of university graduates, career counselors can use the CTI test as a career profile and focused at designing, developing, implementing, monitoring students' career development programs. Career profiles that measure career thinking dysfunction can help improve students ’career readiness (Mohd Izwan et al., 2019; Bertoch, et al., 2013). Students with high career readiness, will exhibit positive career behaviors such as the ability to make career decisions, and solve career -related problems (Mohd Izwan, et al., 2018).

Conclusion and Suggestions

The use of the CTI test tool is appropriate for groups of (i) school students to choose education at the tertiary level such as college and university, job selection or job search; (ii) college or university

students in making a choice of field of study, career field and job search; and (iii) adults who are considering career or change careers, looking for employment or are unemployed or to re -enter employment after not working for a period of time(Mohd Izwan et al., 2019; Atta, et al., 2013; Sampson et al., 1999). For the use of further research, researcher should focus on the university student population through survey -type studies, involving a larger population, gender, stream of study, and program of study. In addition to conducting comparisons with demographic factors such as type of university, socioeconomic status, level of education, parental career, and culture (Donghyuck Lee, et al., 2016).

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