

## A psychometric evaluation of the career decision making self-efficacy scale

Chandra Yudistira Purnama\*; Linda Ernawati

Universitas Jenderal Achmad Yani

Jl. Terusan Jenderal Sudirman, Cibeber, Cimahi Selatan, Kota Cimahi, Jawa Barat 40531, Indonesia

\*Corresponding Author. E-mail: [chandra.yudistira@lecture.unjani.ac.id](mailto:chandra.yudistira@lecture.unjani.ac.id)

### ARTICLE INFO

#### Article History

**Submitted:**

8 April 2021

**Revised:**

25 June 2021

**Accepted:**

29 June 2021

#### Keywords

career; CDMSE (career decision making self efficacy); CFA

#### Scan Me:



### ABSTRACT

The assessment tool for a career currently being developed requires special treatment from a psychologist/psychometrist. The measurements are conducted when students are confused about career options. However, for students who have decided, it is uncommon for them to seek professional help. Psychological tools that focus on capturing information about students' maturity in relation to their ability to make career decisions can help them choose a major that is suitable for their career. This study concerns adapting the career decision-making self-efficacy (CDMSE) that can predict one's confidence in his/her ability to make career choices. The adaptation of this instrument went through several stages such as translation, back translation, testing the reliability, and testing the validity evidence of content and internal structure using confirmatory factor analysis (CFA). This study used a sample of 539 high school students in Bandung and Cimahi. The construct reliability (CR) of the instrument was  $\alpha=0.929$ . The evidence for internal structure using CFA showed that the CDMSE scale has an acceptable goodness of fit index. The standardized loading factor item is in the range 0.710-0.998. It can be concluded that the Bahasa Indonesia version of the CDMSE scale has good psychometric properties and can be used for research or assessment to measure a person's degree of confidence about his/her ability to make career choices.

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#### How to cite:

Purnama, C., & Ernawati, L. (2021). A psychometric evaluation of the career decision making self-efficacy scale. *Jurnal Penelitian dan Evaluasi Pendidikan*, 25(1), 77-87. doi:<https://doi.org/10.21831/jpep.v25i1.39960>

## INTRODUCTION

Senior high school students have an age range between 15-19 years so that with this age range, they can be categorized into adolescence. Adolescence is a period where a person begins to be faced with a lot of situations where they have to choose. In this period, one of the development tasks was to choose and prepare to carry out a job (Hurlock, 1972). According to Seligman (1994), at approximately 17 years old, teens realized that they are responsible for his career planning. In adolescence, career development runs along with getting older and experiencing dynamics that are important in the school (Seligman, 1994). Senior high school students are in the period to determine a major in higher education to achieve the desired career. Adolescents are in the phase of self-determination. They are required to develop their self-identity and make decisions in accordance with environmental demands (Lewis, 1981). During this period, adolescents are expected to know and realize the need to make career decisions, understand their potential, be aware of their interests and talents, measure their own abilities, and identify suitable job opportunities (Walsh et al., 2000).

The selection of fields of work is closely related to the selection of educational programs to be pursued. The chosen area of educational programs can support their success when starting and pursuing their future careers. Thus, one must understand the demands of their choice of work (Islamadina & Yulianti, 2017). A certain job will require special abilities, expertise, or

skills that can be obtained through formal or informal learning. In their career development, adolescence is filled with exploration (Suryanti et al., 2011). Adolescents try to explore all the possibilities. They try to understand everything that will become their needs in facing future challenges (Super & Super, 2001).

The current phenomenon among adolescents is that many students experience confusion when they have to choose a major and their future careers (Creed et al., 2005). There are still many cases of adolescents who choose a major in university without considering their abilities, skills, interests, talents, or personality. Most of them tend to choose majors for prestige, following peers, the trends of professions, job popularity, income, certain figures, and even their parents, and some are because of their parent's wishes.

Thus, determining the majors in higher education and future careers at the end of high school becomes an important moment. The decision to make and plan career choices supports the individual's success in the future life. Their understanding of the type of career, the field of work, interests, and talents is important before deciding which career to pursue. Students who have a strong career maturity can make decisions steadily, while those with low career maturity will experience confusion and have no clear career plan. Regarding this, many students seek help from school counselors, teachers, career consultants, and even educational psychologists to help them and provide insight into their potential to avoid mistakes in choosing a major and establishing a career. One method to see an individual's maturity degree in determining the career is using psychological assessment tools. Currently, many psychological assessment tools can measure this to help students be optimal in determining careers. One such measure is Career Decision Making Self Efficacy (henceforth CDMSE) (Betz et al., 1996).

CDMSE scale was developed by Taylor and Betz in 1983 consisting of five dimensions, namely, career choice competencies in the areas of goal setting (GS), gathering occupational information (GI), problem-solving (PS), planning (PL), and also self-appraisal (SA) (Betz et al., 1996). From the five dimensions, 50 items were compiled. Each dimension is represented by ten statements. In 1996, the instrument was revised by Betz, Klein, and Taylor to only 25 items. The statement items are selected from the best five statements from each dimension (Betz et al., 1996). CDMSE are self-report using Likert scale with five options, namely strongly agree, agree, neutral, disagree, and strongly disagree.

Observing the CDMSE aspects, this measurement tool will greatly assist education counselors, counseling teachers, career consultants, and educational psychologists in assessing and predicting the right career prospect for students in universities, helping plan, and choosing a career in the future. Measuring instruments can be used to capture information about students, especially the suitability between individual characteristics and the desired career choice.

One of the challenges that sometimes surge is when there is a mismatch of the items used in the instruments made internationally when it is used in Indonesia. The incompatibility of the context of language, culture, or even the meaning of the term can be misinterpreted, so it is necessary to re-research and adapt the assessment tool to Indonesia's cultures. The purpose of adapting this measuring instrument is to obtain a CDMSE measuring instrument in accordance with Indonesian culture and the provisions of psychometric rules. The adaptation focuses on language, terms, diction, wording, scaling, and norm. Besides, by re-conducting research and adapting the instruments, it is hoped that items or statements obtained are in line with the culture of students in Indonesia and the validity, reliability, and norms to interpret the results of the scores of these students.

## RESEARCH METHOD

Data collection for testing the CDMSE instrument was carried out online using the Google Form involving 539 high school students in Bandung and Cimahi. In detail, a description of the respondents participating in this CDMSE instrument testing is shown in Table 1.

Table 1. The Description of the Respondents

Category	N = 539
Gender	
Male	219 students
Female	320 students
Age	
17 years old	489 students
18 years old	50 students

Based on the demographic description in Table 1, respondents who participated in the testing of the CDMSE instrument were dominated by female participants, with a total of 320 respondents (59%) and 219 men (41%). The age of respondents was dominated by students aged 17 years old with a total of 489 respondents (90.7%), and aged 18 years old, with total of 50 respondents (9.3%), and the mean age of the respondents was 17.09 years old (SD=0.29).

## Procedure

The procedure of adaptation CDMSE scale begins with the process of translating a foreign language (English) into Bahasa and back translating it from Indonesian to a foreign language (English) (explained at the translation stage). After completing the translation process and being approved to proceed to the next stage, the next step is testing instruments CDMSE using statistical methods. The process carried out to obtain the statistical analysis results is by distributing online questionnaires to respondent high school students in Bandung and Cimahi. After the data was obtained, and then continued by analyzing the reliability coefficient of the measuring instrument and evidence of validity based on the internal structure using confirmatory factor analysis. The stages of adaptation to the CDMSE scale and its data processing are elaborated as follows.

### *Stage 1: The Career Decision Making Self Efficacy Scale Translation Process*

In the first stage, the researchers' initial step was to translate the instrument from English to Bahasa Indonesia. This stage refers to the process of adapting assessment tools based on the guidelines from the International Test Committee (ITC) guidelines for translating and adapting tests (International Test Commission, 2016). The process of translating CDMSE in English into Bahasa Indonesia was carried out by four people separately. The first and second translators are professional translators who have a bachelor's degree in English literature and work as English teachers. The third and fourth translators are psychologists who have experience constructing psychological assessment tools for both academic and practical needs.

The second step was done after obtaining the translation from the four translators. The translators and researchers discussed, reviewed, and made revisions to the translation results. The final result in the second stage was to obtain a Bahasa Indonesia version of the CDMSE draft. In the third step, the initial manuscript of the Bahasa Indonesia version of the CDMSE was re-translated into English by three professional translators. Two translators work as English teachers in high school, and as professional translators, another person works as a teacher and translator at the English Language Course Institute. The results of the re-translation into English were checked for their suitability in meaning by comparing the CDMSE translation results from Bahasa Indonesia to English with the original English version of the CDMSE assessment tool. The wording of the questionnaire sentences in Bahasa Indonesia that did not match or have different meanings from the English version was corrected and revised again to get the appropriate and relevant words. Next, in the fourth stage, the Bahasa Indonesia version of the CDMSE manuscript, which was revised and adjusted based on the input from the re-translation process, was submitted to four experts to get a review of the clarity and appro-

priateness of conceptualization the aspects being measured. The three experts involved in reviewing the Bahasa Indonesia version of the CDMSE manuscript were lecturers at the Faculty of Psychology, Universitas Achmad Yani (henceforth UNJANI), who had experience compiling measurement tools in psychology and teaching career development courses. Meanwhile, one other person was a psychology doctoral student at the Faculty of Psychology, Universitas Padjajaran Bandung. The four experts reviewed, provided input, and corrected the wording of the translated items on the Bahasa Indonesia version of the CDMSE assessment tool. The experts were given attachments of the original English version of the CDMSE instrument, the translation result from English to Bahasa Indonesia, the CDMSE manuscript agreed to be re-translated into English, the results of the re-translation from Bahasa Indonesia to English, and the Bahasa Indonesia version of the CDMSE manuscript that has been adjusted. After the experts gave suggestions, comments, input, and corrections to the less relevant or inappropriate items, the researchers made improvements to the wording of the items. These improvements were discussed again and were followed up to get the final manuscript of the Bahasa Indonesia version CDMSE instrument.

In the fifth stage, the Bahasa Indonesia version of the CDMSE final manuscript was distributed to 20 students of the Faculty of Psychology UNJANI to be tested for its readability. This stage is to get valid evidence based on test responses from the subject. The process done with students was to read together with the Bahasa Indonesia version of the CDMSE final script with a loud speaks, then asked for their explanation and confirmed the understanding of each student on each item in the Bahasa Indonesia version of the CDMSE manuscript. After confirmation of the students' readability and comprehensiveness, the Bahasa Indonesia version of the CDMSE final manuscript was converted into a digital/online version using the Google Form. Then, the Bahasa Indonesia version of the CDMSE scale that has been converted into an online version was distributed to students in Bandung and Cimahi through the counseling teachers in each school. During the one week of data collection, 539 high school students filled the Google Form.

### ***Stage 2: Reliability Testing and Model Testing of Carrer Decision Making Self Efficacy Scale***

The second stage was done to gain the reliability coefficient of the assessment tool using construct reliability (CR), average variance extracted (AVE), and testing the internal structure of CDMSE using confirmatory factor analysis (CFA). Data processing for testing the measurement tools (reliability test and validity evidence) was done using JASP 0.14.1 and Lisrel. This CDMSE scale consists of five dimensions (GI, SA, GS, PL, and PS), and each dimension consists of five items. Thus, the total number of items in this instrument is 25 items.

The data collection to obtain reliability values and validity evidence of the internal structure involved 539 high school students in Bandung and Cimahi. The CDMSE instrument that had been translated and approved through an expert review was compiled into an online questionnaire using the Google Form. The link to the questionnaire was sent to the counseling teachers in each school and distributed to students. Within one week, 539 respondents submitted the answers to be used in the data processing to test reliability and obtain valid internal structure evidence.

### **Data Analysis**

The researchers used the JASP version 0.14, Lisrel program, and Statcal to process the data and get a composite reliability score and validity evidence from the CDMSE scale. Composite Reliability is a reliability coefficient that can be used for multidimensional measures (Heise & Bohrnstedt, 1970), and confirmatory factor analysis is used to confirm whether the indicator variables can be used to confirm a factor (Ferdinand, 2011).

## FINDINGS AND DISCUSSION

### Reliability Test and Item Analysis of Carrer Decision Making Self Efficacy Scale

Data processing for the reliability test of the CDMSE instrument was carried out using Microsoft Excel 2019, JASP version 0.14, and Statcal. Reliability can be expressed as the internal consistency of an instrument that can be measured based on the level of item homogeneity. [Hair et al. \(2010\)](#) explain that the reliability test in the CFA analysis includes the construct reliability (CR) and variance extracted (AVE). [Hair et al. \(2010\)](#) state that the CR value  $\geq 0.7$  is good reliability, while the CR value between 0.6 and 0.7 is acceptable reliability, with a note that the indicator has a factor load that matches the criteria. Internal consistency can also be measured using the Average Variance Extracted (AVE) estimate. The recommended AVE value is  $> 0.5$  ([Hair et al., 2010](#)).

Table 2. Construct Reliability (CR) and Average Variance Extracted (AVE)

Variable	CR	AVE
Gathering of Information	0.84	0.51
Self Appraisal	0.83	0.51
Goal Selection	0.86	0.55
Planning	0.83	0.53
Problem Solving	0.89	0.63
CDMSE	0.97	0.88

Source: Statcal

Table 3. Frequentist Individual Item Reliability Statistics

If Item Dropped			If Item Dropped		
Item	McDonald's $\omega$	Item-Rest Correlation	Item	McDonald's $\omega$	Item-Rest Correlation
GI 1	0.957	0.575	GS 4	0.956	0.670
GI 2	0.956	0.644	GS 5	0.955	0.745
GI 3	0.955	0.747	PL 1	0.956	0.640
GI 4	0.955	0.708	PL 2	0.956	0.652
GI 5	0.956	0.682	PL 3	0.956	0.622
SA 1	0.956	0.686	PL 4	0.957	0.602
SA 2	0.956	0.632	PL 5	0.956	0.697
SA 3	0.955	0.700	PS 1	0.955	0.730
SA 4	0.956	0.608	PS 2	0.955	0.777
SA 5	0.956	0.632	PS 3	0.955	0.757
GS 1	0.956	0.658	PS 4	0.956	0.672
GS 2	0.955	0.746	PS 5	0.956	0.685
GS 3	0.955	0.711			

Source: [Goss-Sampson \(2018\)](#). JASP (Version 0.14.1) [Computer software]

Table 2 shows the construct reliability (CR) and average extracted variance (AVE), while Table 3 informs about item-rest correlation. Table 2 depicts the results of data processing for the reliability test CDMSE. It shows that the CR value for the CDMSE instrument is 0.97. An assessment instrument is said to be reliable if the CR coefficient value is greater than 0.7 ( $\alpha \geq 0.7$ ) ([Hair et al., 2019](#)), so the CDMSE instrument adapted into Bahasa Indonesia is reliable. Table 3 provides information about item analysis to see the quality of items on the CDMSE scale. The data shows the quality of items on the CDMSE scale, whether they have good items or not, by looking at the scores in the item-rest correlation column. An item is good if it has an item-rest correlation value greater than 0.3 ([Pallant, 2011](#)). The test results on the item quality obtained the item-rest correlation coefficient value in the range of 0.575 to 0.777.



## Validity Evidence

The examination of the validity evidence on the CDMSE scale used guidelines from AERA, that is, evidence based on test content, evidence based on test responses, evidence based on internal structure, evidence based on relation to other variables, and evidence based on consequences of the testing (American Educational Research Association (AERA) et al., 2014). Of the five pieces of evidence validity, the researchers only carried out three pieces of evidence. First, it was evidence-based on test content obtained from the subject matter expert (henceforth SME). Second, it was based on evidence-based test responses obtained from the readability of students and lecturers. Lastly, the third was evidence based on the internal structure using confirmatory factor analysis.

In obtaining valid evidence based on test content, the researchers asked the SME to assess whether the items in the CDMSE scale were relevant and in accordance with the construct. The SMEs gave a score of 1 for items that were considered strongly irrelevant, a score of 2 for items considered irrelevant, a score of 3 for items considered fair enough relevant, a score of 4 for items considered relevant, and a score of 5 for items that were considered strongly relevant. The context of the assessment is viewed from the suitability of the language, clarity of the wording, and the suitability of the meaning of the translated sentence. The results of the SME assessment were processed with Aiken's V formula (Aiken, 1985). The Aiken's V value for all CDMSE items ranged from 0.83 to 0.92. Hence, the CDMSE scale can be used to measure confidence in making career decisions.

In the process of obtaining valid evidence in the form of evidence based on test responses, it is obtained through the readability of 20 respondents. Based on the responses from students, the items in the CDMSE scale can be understood well.

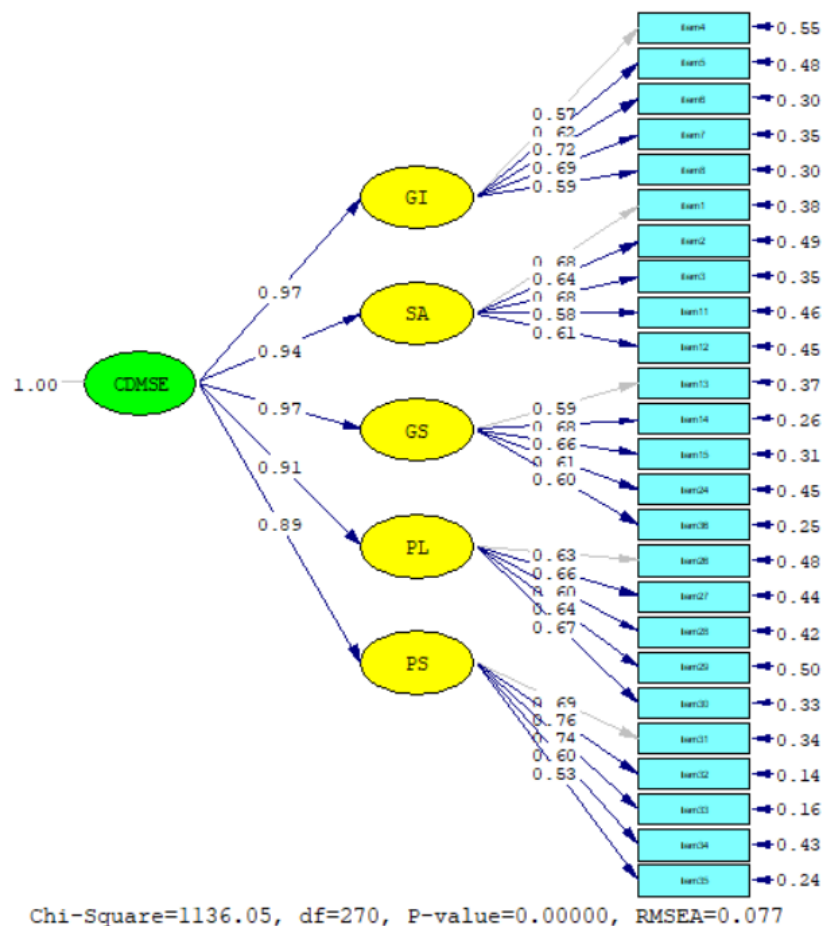


Figure 1. The Results of the Model Fit Test

The next evidence is evidence based on the internal structure using confirmatory factor analysis (CFA). The benchmarks used to interpret the suitability of the model in this study refers to Hu and Bentler who recommended four parameters, namely, the Chi-Square Test  $p$ -value  $\geq 0.05$ ; the Root Mean Square Error of Approximation (RMSEA)  $\leq 0.08$ ; Comparative Fit Index (CFI)  $\geq 0.95$ ; and Standardized Root Mean Square Residual (SRMR)  $\leq 0.08$  (Hu & Bentler, 1999). Meeting these criteria means that the instrument meets the appropriate model criteria. Figure 1 shows the results of the model fit test using CFA.

Table 4. The Goodness of Fit Indices from the CDMSE Model

Category	Parameter Fit	Output	Cut Off	Criteria	Information
Absolute Fit	Chi square p-value	< 0.000	> 0.05	Good Fit	Not Fit
	GFI	0.86	$\geq 0.90$ 0.80 - 0.89	Good Fit Marginal Fit	Marginal Fit
	RMSEA	0.07	$\leq 0.08$ 0.08 - 0.10	Good Fit Marginal Fit	Good Fit
	SRMR	0.048	< 0.08 0.08 - 0.10	Good Fit Marginal Fit	Good Fit
	Incremental Fit	AGFI	0.83	$\geq 0.90$ 0.80 - 0.89	Good Fit Marginal Fit
	NFI	0.97	$\geq 0.90$ 0.80 - 0.89	Good Fit Marginal Fit	Good Fit
	IFI	0.98	$\geq 0.90$ 0.80 - 0.89	Good Fit Marginal Fit	Good Fit
	CFI	0.98	$\geq 0.90$ 0.80 - 0.89	Good Fit Marginal Fit	Good Fit
	Parsimonious Fit	PNFI	0.87	> 0.5	Good Fit

Source: Ghozali & Fuad (2005)

Based on the goodness of fit indices test presented in Table 4, there are six that meet the criteria, namely, RMSEA of  $0.07 \leq 0.08$ , SRMR of  $0.048 \leq 0.08$ , NFI of  $0.97 \geq 0.90$ , IFI of  $0.98 \geq 0.90$ , CFI of  $0.98 \geq 0.90$  and PNFI  $0.87 \geq 0.05$ . There are two criteria that meet marginal fit criteria: GFI of  $0.85 \leq 0.90$ , AGFI of  $0.83 \leq 0.90$ , and one criterion that cannot be fulfilled is the chi-squared test because the  $p$ -value obtained  $< 0.001$ . The Chi-Square value is the traditional measure to evaluate the suitability of the overall model (Hu & Bentler, 1999). A good fit model will give insignificant results at the 0.05 threshold (Barrett, 2007). The Chi-square index is the most used index to check the accuracy of the model. However, this index is strongly affected by the sample size (Bergh, 2015). If the sample is too small, the trend will be insignificant, while the trend will be significant if the sample is too large. Thus, the Chi-square almost certainly rejects the model if a large number of samples are used. In this study, the sample size used was 539.

Based on the test results of the fit model, from nine proposed parameters, there are eight that meet the criteria, six criteria (RMSEA, SRMR, NFI, IFI, CFI, and PNFI) for a good fit, and two criteria (GFI and AGFI) for marginal fit, while one criterion (Chi-square) does not meet the criteria. Therefore, the researchers tried to modify the model to get a better model. Attempts to modify the model are by deleting items. The results of model testing after modification are shown in Figure 2.

Based on the modification results, ten items were obtained that matched the model, including GI3, GI4, SA1, SA2, GS2, GS3, PL4, PL5, PS2, and PS5. Then, the results of the goodness of fit of indices test are shown in Table 5. From Table 5, the model is fit. There is no significant difference between the model ideal with the proposed model based on measurements. All parameters of goodness of fit indices have also been according to the criteria set for

obtaining a model fit. Thus, the final model is already fit, which means the model proposed fits the empirical data. The complete model and loading factor of each item in the final model can be seen in Figure 2.

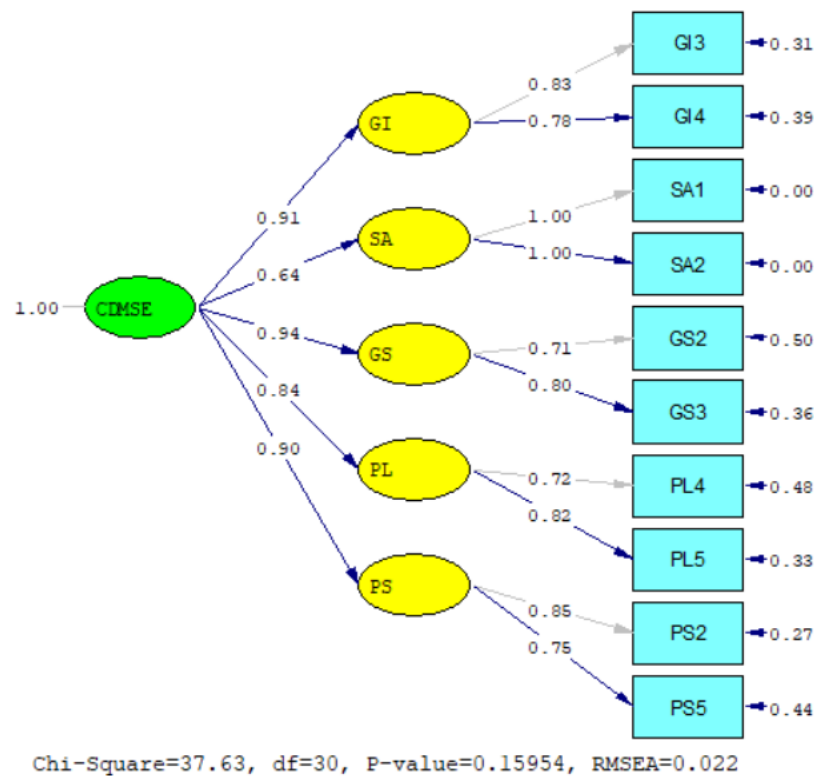


Figure 2. The Results of the Model Fit Test

Table 5. The Goodness of Fit Indices from the CDMSE Model

Category	Parameter Fit	Output	Cut Off	Criteria	Information
Absolute Fit	Chi square p-value	0.159	> 0.05	Good Fit	Good Fit
	GFI	0.99	≥ 0.90	Good Fit	Good Fit
			0.80 - 0.89	Marginal Fit	
	RMSEA	0.022	≤ 0.08	Good Fit	Good Fit
			0.08 - 0.10	Marginal Fit	
Incremental Fit	SRMR	0.020	< 0.08	Good Fit	Good Fit
			0.08 - 0.10	Marginal Fit	
	AGFI	0.97	≥ 0.90	Good Fit	Good Fit
			0.80 - 0.89	Marginal Fit	
Parsimonious Fit	NFI	0.99	≥ 0.90	Good Fit	Good Fit
			0.80 - 0.89	Marginal Fit	
	IFI	0.99	≥ 0.90	Good Fit	Good Fit
			0.80 - 0.89	Marginal Fit	
	CFI	0.99	≥ 0.90	Good Fit	Good Fit
			0.80 - 0.89	Marginal Fit	
Parsimonious Fit	PNFI	0.66	> 0.5	Good Fit	Good Fit

Source: Ghozali & Fuad (2005)

The next part examines the results of the factor loading analysis of the CDMSE assessment tool. The test results can be seen in Table 6. The criteria for an item to be said to have a good factor loading is when the factor loading value is  $\geq 0.5$  (Hair et al., 2019).



Table 6. Factor Loading of CDMSE

Factor	Indicator	Std. Est. (all)
Gathering of Information	GI 3	0.827
	GI 4	0.782
Self Appraisal	SA 1	0.999
	SA 2	0.998
Goal Selection	GS 2	0.710
	GS 3	0.794
Planning	PL 4	0.720
	PL 5	0.823
Problem Solving	PS 2	0.856
	PS 5	0.750

Based on the results of the standardized loading factors, the CDMSE items and each dimension have a factor loading value above 0.5 with a range between 0.710 - 0.998. This shows that the quality of the items is classified as good.

After testing the model and standardized loading factors, a reliability test was then carried out. Reliability testing in CFA includes the construct reliability (CR) and variance extracted (AVE). The results of the reliability test are shown in Table 7 and Table 8.

Table 7. Construct Reliability (CR) and Average Variance Extracted (AVE)

Variable	CR	AVE
Gathering of Information	0.786	0.648
Self Appraisal	0.998	0.997
Goal Selection	0.723	0.568
Planning	0.747	0.597
Problem Solving	0.786	0.648
CDMSE	0.929	0.726

Source: Statcal

Table 8. Frequentist Individual Item Reliability Statistics

Item	If Item Dropped	
	McDonald's $\omega$	Item-Rest Correlation
GI3	0.896	0.714
GI4	0.898	0.683
SA1	0.898	0.688
SA2	0.898	0.687
GS2	0.902	0.605
GS3	0.897	0.701
PL4	0.906	0.576
PL5	0.900	0.663
PS2	0.828	0.729
PS5	0.901	0.640

Based on Table 7, the CR value for the CDMSE instrument after modification is 0.929. Thus, based on the test results, the CDMSE instrument adapted into Bahasa Indonesia is reliable. Table 8 shows that the test results on the item quality obtained the item-rest correlation coefficient value from 0.576 to 0.729.

The results of this study were conducted on a sample of students from Bandung and Cimahi. This is one of the limitations of this study because it does not involve many students from other cities in Indonesia. Therefore, for further research, it is recommended to expand the coverage of student participants from various cities and regions in Indonesia and increase the sample size to obtain a more fit model with a larger scale of participants.

## CONCLUSION

Based on the findings of the research regarding the psychometric analysis of the adaptation of the CDMSE scale into Bahasa Indonesia, some conclusions can be drawn, as follows. (1) The CDMSE scale test results can be said reliable. It means that it can consistently measure an individual's level of self-confidence regarding his or her ability to make career choices. (2) The CDMSE scale with five dimensions has a model that fits the original construct based on Goodness of Fit Indices. (3) The test results showed good item quality and can accurately measure the dimensions of one's CDMSE. Thus, these items can measure the level of an individual's self-confidence regarding his or her ability to make career choices. (4) The CDMSE scale can be used to measure a person's CDMSE scale and as an additional variety of instruments related to career assessment tools.

## ACKNOWLEDGMENT

The authors express their heartfelt gratitude to the Institute of Research and Community Service (LPPM) of Universitas Jenderal Achmad Yani for supporting and funding this research.

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