



The development of Adolescent Career Resilience Scale (ACRS): A Rasch model analysis

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Abstract

Career resilience plays a central role in individual career development and can make individuals find their attitudes, behaviors, and actions that are appropriate to changing situations. The high and low career resilience also affects the individual's career success. Career resilience has been essential to developing since adolescence, but there has been no instrument development to explore adolescent career resilience. This study aims to develop the Adolescent Career Resilience Scale (ACRS) using the Rasch model analysis. The research uses a quantitative approach. Determination of research participants using a convenience sampling method. The participants in this study were 312 students (104 junior high school students, 104 senior high school students, and 104 vocational students in Banten province) involved in the empirical test. ACRS has an item reliability value of 0.97 in the Special category and personal reliability of 0.70 in the good category. Cronbach's Alpha value is 0.78 with a good category. The results of ACRS analysis using the Rasch model produce 31 items that can be used to reveal adolescent career resilience.

Keywords: Career resilience, Career resilience instruments, Career development, Rasch model

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Introduction

Change is something that cannot be avoided, even happens with increasing speed. Many factors drive change, some of which are the dynamics of economic growth, technological progress, and the population's welfare (Mishra & McDonald, 2017). According to Oey-Gardiner *et al.* (2017), Gradually change will cause disruption, namely an era of innovation that causes significant changes fundamentally in existing systems, arrangements, and landscapes in new ways. In this era of disruption, individual careers become uncertain and insecure (Maree, 2018).

Unpredictability and insecurity career occur because of changes in the world of work. Jobs that were initially safer because they could work as permanent workers are now difficult; most employers use a contract system so that workers can be fired anytime (Lengelle *et al.*, 2017). Although being a permanent worker, the individual will be faced with various problems in the world of work that will make the individual difficult, depressed, and stressed and can cause the individual to quit his job because he cannot overcome this difficulty (Mishra & McDonald, 2017). Meanwhile, individuals who will enter the world of work or have just graduated are faced with the problem of global competition that can make individuals experience various rejections; if individuals cannot handle rejection and competition, individuals will have difficulty getting a job. This situation requires individuals to have career competencies such as career adaptability, career resilience, and employability skills (London & Mone, 1987; Mishra & McDonald, 2017).

Between career adaptability and employability skills, career resilience is a fundamental ability to survive in the 21st Century (Cascio, 2007). If career adaptability is the ability to adjust to career changes (Hartung & Cadaret, 2017), employability skills function as the ability to get a job (Di Fabio, 2017). Career resilience is a competition that can make individuals stay at work and be good in transition (London & Mone, 1987).

Career resilience enables individuals to withstand career pressures in unfavorable situations. Career resilience is also a meta-competence to adapt quickly (protean), be ready to change, and survive in career

transitions (cope with career transitions). Individuals who have high career resilience have a more significant opportunity to achieve their career goals because with career resilience, individuals will be able to face difficulties and be able to adapt to changes and also arise from career adversity so that individuals have high career resilience (Hirschi, 2012; Lengelle et al., 2017; London & Mone, 1987; Mishra & McDonald, 2017).

Career resilience plays a central role in individual career development and can make individuals find attitudes, behaviors, and actions that are appropriate to changing situations (Tomassini, 2015). High and low career resilience affects individual career success (Ahmad et al., 2019). Referring to these two opinions, it can be concluded that all individuals from the level of children to adults need career resilience. The development of career resilience in children and adolescents deserves necessary attention because according to London, career resilience develops from childhood and adolescence (London & Mone, 1987).

Career development in adolescents is help in preparing adolescents to face the megatrend in 2045 (the era of the emergence of Indonesia's Golden Generation 2045). Megatrends arise due to the demographic bonus in various countries, especially in Asia (Kemendikbud, 2017; Saripudin et al., 2022). This megatrend affects changes in the fields of global urbanization, international trade, global finance, income class, competition for natural resources, climate change, technological progress, geopolitical changes, and geoeconomics changes (Kemendikbud, 2017). According to Kemendikbud (2017), this change will lead to open competition among the world's people. One of them is that people will enter the same labor market.

An open labor market can create pressure, problems, and stress for workers (Saripudin et al, 2022). In this situation, individuals must have high career resilience, to be able to survive in the pressure of an uncertain career situation to be able to adapt to this situation (Fourie & van Vuuren, 1998; London & Mone, 1987; Mishra & McDonald, 2017). Career resilience has a positive correlation with the skills needed to achieve career success such as career adaptability, optimism, hope, career maturity, career goals, and career decision-making (Ahmad et al., 2019; Barto et al., 2015; di Maggio et al., 2016; Han et al., 2019; van Vuuren & Fourie, 2000).

The narration above implies developing adolescent career resilience as individuals who will face megatrends. Adolescent career resilience becomes something essential to be developed as a way to prepare teenagers to face the global market. Career resilience can be developed through guidance and counseling services (Saripudin et al., 2022). However, until now there is no tool that can reveal adolescent career resilience.

Career resilience instruments are needed by guidance and counseling teachers or counselor to reveal which indicators need to be developed in students. Until now, career resilience can only be revealed by the instrument developed by Fourie & Van Vuuren (1998). This instrument is intended for adults. Then the instrument was also considered irrelevant by Lew & de Bruin retest (2000). This research is here to fill the gap, which aims to develop a career resilience instrument specifically for adolescents. This instrument can be called the Adolescent Career Resilience Scale (ACRS). The development of the ACRS instrument was analyzed using the Rasch model.

The results of this study are expected to provide some research contributions. First, the Adolescent Career Resilience Scale (ACRS) which is developed later can be a reference for researchers and guidance and counseling teachers or counselors to measure students' career resilience. Second, expand the discussion on career resilience, especially instrument development. Third, the analysis of the Rasch model used in this study is the first time and has never been done.

Method

Research Design

This study uses a quantitative approach. Instrument development through four processes. First, the development of items based on theory. Second, items are assessed by career guidance experts. Third, the instrument is distributed using a google form. Fourth is data processing and analysis.

Participant

Determination of research participants using the convenience sampling method, namely the determination of participants based on their willingness to participate in the study (Houser, 2020). The participants involved in this study were 312 students in junior high school (SMP), senior high school (SMA), and vocational school (SMK) in Banten Province. 104 junior high school students, 104 senior high school students, and 104 vocational students.

Instrument

This study aims to develop an instrument that can reveal adolescent career resilience. The development of the instrument uses the London Career Resilience theory. London defines career resilience as an individual's ability to adapt, survive and recover from career disturbances and situations that are less than optimal (London, 1983; London & Mone, 1987; London & Noe, 1997). There are four indicators of resilience, according to London, namely:

1. Believing in one's abilities can be seen from the indicators of being able to adapt, being able to convey ideas that they have, and trying to encourage career advancement.
2. The need for achievement consists of indicators of making the best effort in completing tasks, taking the initiative to do what is needed to achieve career goals, and having a high desire to learn new skills.
3. Willingness to take risks consists of being able to express ideas even though they are contrary to others, not being afraid to tell others when they make mistakes, taking risks for something they believe in, and being innovative in doing work.
4. Able to work independently and with others, including indicators of comfort working alone or in groups, working effectively both alone and in groups, and finally being able to complete tasks well.

Data Analysis

The data obtained from the participants were processed in Microsoft Excel Spreadsheet. Then to analyze the results of the study to produce the validity and reliability coefficients, testing was carried out using the Rasch model analysis with the WINSTEP 3.73 application. The results obtained are then analyzed and compared with existing theories.

Results and Discussion

Rating Scale

The initial model of the Adolescent Career Resilience Scale (ACRS) consists of 46 items using a Likert scale with favorable and unfavorable statements. The choice of scale consists of very often, often, sometimes, rarely, and never. The statement's value depends on the statement type, which can be seen in table 1.

Table 1. Skala Likert

Likert	Very Often	Often	Occasionally	Seldom	Never
<i>Favorable</i>	5	4	3	2	1
<i>Unfavorable</i>	1	2	3	4	5

The results of the Rating Scale analysis on the Adolescent Career Resilience Scale (ACRS) can be seen in Table 2 below:

Table 2. Summary of Category Structure Model R

CATEGORY LABEL	SCORE	OBSERVED COUNT	OBSVD %	SAMPLE AVRGE	INFIT EXPECT	OUTFIT MNSQ	ANDRICH MNSQ	ANDRICH THRESHOLD	CATEGORY MEASURE
1	1	1561	11	-.34	-.37	1.06	1.09	NONE	(-2.25)
2	2	2525	18	-.16	-.15	.96	.96	-.74	-.92
3	3	4533	32	.05	.08	.88	.84	-.63	-.01
4	4	3262	23	.04	0.37	0.94	.96	.55	.91
5	5	2471	17	.07	0.72	1.05	1.06	.82	(2.29)

Table 2 shows the increase in the threshold value between each category. For example, the second to the third category is around 0.11 logit; from the third to the fourth category, it is around 1.18 logit; from the fourth to fifth category, it is 0.27 logit. Then, the average value of the observations starts from -0.37 (for a score of 1) to 0.72 (for a score of 5). This logit means that there is an average increase. Based on Rangka et al. (2018), the average increase in the logit value of observations shows that the instrument has very good scale validation. So, referring to this theory, the scale used by the Adolescent Career Resilience Scale (ACRS) has a very good scale validation because of the increase in logit in each category

Unidimensionality

Unidimensionality is an important measure to evaluate whether the developed instrument can measure what should be measured as the construct of career success. The criteria that the test instrument developed can measure range variables or measure the subject's ability to answer question items if *Raw Variance*

Explained by Measures (>20%) with both consisting of total raw unexplained variance values (<15%) (Sumintono & Widhiarso, 2014). The results are presented in Table 2 as follows.

Table 3. Unidimensionality item test result ACSI

	Empirical		Modeled	
Total raw variance in observations	64.3	100.0%		100.0%
Raw variance explained by measures	18.3	28.5%		28.8%
Raw variance explained by persons	.5	.8%		0.8%
Raw Variance explained by items	17.8	27.7%		28.0%
Raw unexplained variance (total)	46.0	71.5%	100.0%	71.2%
Unexplned variance in 1st contrast	6.3	9.8%	13.7%	
Unexplned variance in 2nd contrast	5.2	8.0%	11.2%	
Unexplned variance in 3rd contrast	2.8	4.3%	6.1%	
Unexplned variance in 4th contrast	1.9	3.0%	4.2%	
Unexplned variance in 5th contrast	1.7	2.6%	3.7%	

The result of the unidimensionality test on 312 respondents showed that the raw variance value explained by measures was 28.5%, which indicated that the minimum 20% unidimensionality requirement could be met. While the value of unexplained variance in the first contrast is 9.8%, which means that the variance that the instrument cannot explain is not more than 15% so it can be said that the Adolescent Career Resilience Scale (ACRS) meets the constructed test and can describe the construct of career resilience as it should (Smintono & Widhiarso, 2014).

Item Validity

Item validity includes testing the instrument on each item. In the Rasch model test, the content validity test is carried out by looking at Outfit MNSQ, ZTSD, and PT Measure Corr with the following standards or categories (Smintono & Widhiarso, 2014):

1. X Value *Outfit MNSQ*: $0,5 < \text{MNSQ} < 1,5$
2. Value *Outfit ZSTD*: $-2,0 < \text{ZSTD} < +2,0$
3. Value *Point Measure Correlation (Pt Measure Corr.)*: $0,4 < \text{Pt Measure Corr} < 0,85$

The results of item validity can be seen in Table 4 below:.

Table 4. Adolescent Career Resilience Scale (ACRS) Items Test Results

No. Item	Construct Item (Indicators and sub-indicators)	Favorable (+)/ Unfavorable (-)	Outfit MNSQ	Outfit ZSTD	PT Measure Corr
Believe in yourself: Easy to adjust					
1	Difficulty doing something that has never been done before	-	0.62	-6.2	0.20
9	Feeling unable to adjust to the new environment	-	1.40	5.2	0.37
24	Able to adapt to a new environment	+	0.82	-2.4	0.31
36	Feel confident when talking to new people	+	0.90	-1.6	0.31
Believe in yourself: Convey the idea you have even if the idea is not popular					
3	Have an idea but have a hard time conveying it to others	-	1.02	0.5	0.29
7	Able to convey their ideas even though they are different from other people's ideas	+	0.77	-3.5	0.25

No. Item	Construct Item (Indicators and sub-indicators)	Favorable (+)/ Unfavorable (-)	Outfit MNSQ	Outfit ZSTD	PT Measure Corr
27	Not confident in own ideas when discussing with others	-	0.91	-1.3	0.03
37	Feeling not creative in completing a job	+	1.00	0.1	-0.02
Believe in yourself: Trying to encourage career advancement					
2	Learn new abilities as an effort to improve yourself	+	0.75	-3.8	0.28
12	Trying to encourage yourself to achieve goals	+	1.17	1.6	0.18
17	Improve yourself when there is encouragement from others	-	0.65	-5.9	-0.05
25	Not having a plan for facing life	-	0.89	-1.6	-0.19
The need for achievement: Make the best effort to complete the task					
4	Complete the task without intention	-	0.96	-0.5	0.41
15	Doing all the work as an obligation	-	0.94	-0.8	-0.01
19	Striving for the best results when doing something	+	1.27	3.6	-0.04
46	Always trying to do everything ideally	+	0.76	-3.5	0.32
The need for achievement: Take the initiative to do what it takes to achieve career goals					
5	Prepare to achieve future goals	+	0.96	-0.3	0.40
22	Trying to introspect your shortcomings	+	0.74	-3.9	0.31
29	Living life without a purpose	-	0.86	-2.2	0.31
30	Do not care about your progress	-	1.75	7.7	0.32
The need for achievement: Have a high desire to learn new skills					
13	Have the initiative to learn new things	+	0.68	-4.9	0.37
23	Considering the importance of mastering new competencies as a provision for the future	+	0.83	-1.9	0.26
34	Have no desire to renew me	-	0.85	-2.4	-0.08
41	Feeling no need to master new skills	-	1.01	0.2	0.26
Willingness to take risks: Expressing ideas even if the ideas are opposite to others					
10	Feeling disappointed not to express ideas because it has been preceded by someone else	-	1.29	3.9	0.26
31	Trying to express ideas even though my ideas are different from others	+	1.64	6.5	-0.14
38	Keep trying to express opinions even though they are different from older people	+	1.07	1.1	-0.13
45	Not confident when you have the same idea as other people	-	1.13	1.9	0.17
Willingness to take risks: Not afraid to tell others when they make a mistake					
6	Trying to correct older people when they do something wrong	+	0.89	-1.5	0.07
21	Trying to reprimand others when they do something wrong	+	1.00	0.1	0.22

No. Item	Construct Item (Indicators and sub-indicators)	Favorable (+)/ Unfavorable (-)	Outfit MNSQ	Outfit ZSTD	PT Measure Corr
32	Do not want to cheat on other people who make mistakes	-	0.92	-1.1	-0.19
42	Do not care when other people make mistakes	-	1.19	2.5	0.26
Willingness to take risks: Taking risks for something to believe in					
18	Do not want to fight for something that has a big chance of failure	-	0.95	-0.6	-0.01
20	Keep taking the choices you believe in even though it has the potential for big losses	+	0.85	-2.1	0.27
28	Reluctant to make choices because they have a high potential for failure	-	0.98	-0.3	0.29
35	Believe in your own choice even though it has the potential to fail	+	1.74	8.2	-0.21
Willingness to take risks: Innovative in doing a job					
16	Have a new way of doing things	+	0.95	-0.8	0.01
26	Difficulty solving various problems	-	1.39	4.7	0.27
37	Feeling not creative in completing a job	-	1.00	0.1	-0.02
39	Doing work in a way that other people do not usually do	+	0.68	-5.1	0.26
Able to work independently and work with others: Convenience of working alone or in groups on certain tasks					
8	Feel more comfortable working alone than in groups	-	1.29	4.0	0.24
44	No problem working alone or in groups	+	0.91	-1.3	0.07
14	Feeling able to complete tasks effectively both individually and in groups	+	0.72	-4.5	0.19
40	Feel faster if you do the work individually rather than in groups	-	0.90	-1.5	0.08
Able to work independently and work with others: Able to complete tasks as a form of appreciation for group assignments					
11	Prioritizing individual tasks over group assignments	-	1.03	0.4	0.31
43	Willing to prioritize group work over individual tasks	+	1.27	3.7	-0.07

As described above, to qualify for the content test, each item must meet the MNSQ and Pt Corr values for a respondent size of 312. However, suppose it is observed from the table above. In that case, many Pt Corr values do not meet the minimum value of 0.4, so a decision is taken on items that do not have a negative perception by the respondent and will still be declared valid. Although the value 0.2-0.4 will still be taken if the item can affect the disclosure of the indicator. Even though the Pt value is positive, if it is below 0.2 (0.0-0.19), it is not taken because the opinion of Alagumai et al. in Marfu'I (2018) will affect the instrument's accuracy. Based on these considerations, items 6, 12, 15, 16, 18, 19, 25, 27, 31, 32, 33, 34, 35, 37 and 45 are declared ineligible and must be discarded. Items 14, 17, 38, 40, 43, and 44 should be revised. Items 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13, 20, 21, 22, 23, 24, 26, 28, 29, 30, 36, 39, 41, 42, 46 qualify. Altogether 31 items were retained, and 15 items were discarded.

Difficulty Level Test

The level of difficulty in the Rasch model, according to Smintorno and Widhiarso in Perdana (Perdana, 2018) divided into four categories:

1. Value measure < -1 very easy items
2. Value measure -1 s/d 0 easy items
3. Value measure 0 s/d 1 difficult items
4. Value measure > 1 very difficult items

Based on this categorization, the level of difficulty in the career resilience instrument that was tested on 312 respondents can be seen in the following table:

Table 5. Item Difficulty Level

Explanation	Item Number
Very easy	5, 23, 12
Easy	30, 20, 24, 42, 26, 13, 22, 2, 36, 14, 39, 16, 7, 4, 9, 21, 6
Difficult	40, 29, 33, 27, 28, 28, 37, 11, 8, 44, 19, 34, 1, 41, 10, 15, 17, 32, 3, 45, 25, 43, 18
Very difficult	35, 31

Based on table 5 above, it can be seen that three items are very easy according to the respondents. There are 17 easy items, according to respondents. Twenty-three items were difficult, according to the respondents, and two were very difficult.

Differentiation Test

According to Marfu'I (2018), the criteria of differentiation test of career resilience instrument development can be seen in the value of PT Corr (point measure correlation). Based on this theory, it can be seen that the differentiating power of each item of the career resilience instrument can be presented as follows.

Table 6. Distribution of items by differentiation test

Explanation	Pt Corr	Item Number
Need item check	$< 0,00$	15, 17, 18, 19, 25, 31, 32, 34, 35, 37, 38, 43
Unable to describe indicators	$0,00 - 0,19$	6, 12, 14, 16, 27, 33, 40, 44, 45
Enough	$0,20 - 0,29$	1, 2, 3, 7, 8, 10, 20, 21, 23, 26, 39, 41, 42
Well	$0,30 - 0,39$	9, 11, 13, 22, 24, 29, 36, 46
Very good	$> 0,40$	4 dan 5

Table 6 shows that there are 12 items whose distinguishing power suggests an examination, but considering that respondents do not misperceive negative items. Items included in this category were partially discarded: items 15, 18, 19, 25, 31, 32, 34, 35, and 37. The items numbered 17, 38, and 43 were retained by revision. For the second category, which has a Pt Corr value of $0.00-0.19$, there are three items (14, 40, and 44) that are retained because if they are discarded, this will have an impact on the achievement of each indicator, and therefore will be revised. It is assumed as a qualifying item in the category of sufficient, good, and very good.

Interpretation guide

Adolescent Career Resilience Scale (ACRS) uses measurement results and standard deviation calculations (Azwar, 2010) to determine the category, which can be seen as follows:

Tabel 7. ACRS norm

Criteria	Category
$X \geq 0.17$	Resilience
$X \leq 0.17$	Not Resilient/vulnerable

Based on table 7 regarding the norms above, it can be identified which respondents are resilient or have career resilience and which respondents are not career-vulnerable. The meaning of an individual who is career resilient or not resilient can be seen from the interpretation guide as follows

1. Individuals with career resilience (career resilience) believe in their abilities, need for achievement, are willing to take risks, and can work independently and together in groups when needed.
2. Individuals who are not careered resilient or vulnerable, that is, do not have confidence in their abilities.

Reliability

Reliability describes the consistency of an instrument. According to Sumintono and Widhiarso (2014), the reliability test using the Rasch Model has the following criteria: 1) the value of person measure is greater than logit 0.0, indicating the tendency of respondents to answer "very often" on various career resilience instrument items; 2) Cronbach's Alpha scores were categorized as <0.5 as poor, 0.5-0.6 poor, 0.6-0.7 adequate, 0.7-0.8 good, >0.8 very good; and 3) the value of person reliability and item reliability: <0.67 weak, 0.67-0.80 adequate, 0.80-0.90 good, 0.91-0.94 very good, 0.94: special. Following are the results of the ACRS reliability test:

Table 8. Summary of Reliability Test Results N = 312

	Mean Measure	Separation	Reliability	Alpa Cronbach
<i>Person</i>	0.40	1.71	0,70	0,78
<i>Item</i>	0.00	5.90	0,97	

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Conclusion

Based on the Rasch model analysis, this study developed a valid and reliable 31-item Adolescent Career Resilience Scale (ACRS). ACRS has a Cronbach alpha value of 0.78, which is good for measuring the level of career resilience in adolescents. The variance that cannot be explained by the instrument is not more than 15% so that it can be said that the Adolescent Career Resilience Scale (ACRS) meets the constructed test and can properly describe the construction of career resilience. ACRS can be used to reveal adolescent career resilience both for research purposes and for assessment purposes at school. Using ACRS in schools reveals student career resilience so that Counselors can develop appropriate programs for student. The novelty of this study is to develop a career resilience instrument for adolescents using the Rasch model analysis. However, there is one weakness in this study. This study has not measured the instrument's bias towards gender and culture. So that further research can examine the instrument's bias towards gender and culture.

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