

Assessing the Development of Self-Confidence in Socially Deprived Students: A Rasch Model Analysis

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<https://doi.org/10.17977/um065.v6.i7.2026.12>

Article history

Submitted: 26 May 2026

Revised: 1 July 2026

Accepted: 2 July 2026

Published: 5 July 2026

Keywords

Academic supervision

Instructional leadership

Principal

Teacher potential abilities

Abstract

This research is motivated by the low confidence of students which can hinder academic, social, and emotional success. One of the factors that contribute to low self-confidence in adolescents is social deprivation, which refers to a lack of social interaction or a feeling of isolation in the surrounding environment. This study aims to develop an instrument to measure the confidence of students with social deprivation using the Rasch Model to obtain a valid and reliable measuring tool. A quantitative approach with a survey method through an online questionnaire was used in this study, with participants as many as 396 high school students in Pangandaran Regency who experienced social deprivation, selected through purposive sampling techniques. The instrument was developed based on Lindenfield's theory, covering aspects of inner confidence and innate confidence, and analyzed using the Rasch Model through Winsteps software version 3.73. The results of the study show that this instrument is valid and reliable, with a unidimensionality confirmed through raw variance explained of 48.1%. In addition, response categories 0 and 1 are well understood, supporting validity, while high reliability with Alpha Cronbach 0.89 and Person Reliability 0.87, as well as person-fit analysis show consistent responses. Thus, this instrument can be used to measure the self-confidence of students who experience social deprivation more accurately. The recommendations of this study include the implementation of instruments in guidance and counseling services in schools as well as follow-up research to test the effectiveness of psycho-cybernetics-based interventions in improving students' self-confidence with social deprivation.

1. Introduction

Adolescence is often referred to as a phase of life full of dynamics and challenges. Various demands in the social and academic environment can cause psychological problems that affect mental well-being and individual development. One of the psychological aspects that plays an important role in adolescent development is self-confidence. Confidence is a person's belief in their abilities and potential in facing various life situations. Individuals with high levels of self-confidence tend to be better able to face challenges, achieve success, and maintain optimal mental health (Perry, 2011). On the other hand, low self-confidence can be an obstacle in making decisions, establishing social relationships, and achieving maximum academic achievement (Maxwell, 2015).

Self-confidence is a fundamental aspect of adolescent life because it is closely related to psychological well-being, motivation, and academic performance (Clément et al., 1994; Kukulu et al., 2013). Adolescents who have high self-confidence tend to be more optimistic, resilient, and able to develop effective coping strategies in dealing with social and academic pressure. In contrast, those with low self-esteem are more prone to anxiety, stress, and even depression (Gottlieb et al., 2022). Research shows that a healthy level of self-confidence contributes to success in various aspects of life, both in academic and professional settings (Stankov et al., 2017; Stankov & Lee, 2014).

In a global context, confidence has been recognized as one of the 56 key talent elements (Distinct Elements of Talent/DELTAS) that are needed in the world of work and future life (Kennedy et al., 2022). However, confidence is not an attribute that is shared equally by every individual. Various factors, both internal and external, affect a person's confidence level. Factors such as life experiences, social support, and environmental conditions can play a role in shaping an individual's self-confidence (Bengtsson et al., 2005; Markway & Ampel, 2018).

In the context of education in Indonesia, self-confidence is part of the element of independence in the profile of Pancasila students. The Ministry of Education, Culture, Research, and Technology (2022) emphasizes the importance of self-confidence in shaping student independence and in developing critical thinking skills (Egan, 2019). The role of teachers, especially Guidance and Counseling teachers, is very important in building and developing students' confidence (Maretha et al., 2016). Good confidence is also part of the competency standards of high school graduates, where students are expected to be able to convey original ideas and show creativity in solving problems (Sulistyaningsih, 2018; Synthiawati & Ma'arif, 2021).

One of the factors that can hinder the development of confidence in adolescents is social deprivation. Social deprivation refers to feelings of isolation or inadequacy of social interaction in the surrounding environment (Orben et al., 2020). This can be caused by a variety of factors, such as economic limitations, physical limitations, or unfavorable social conditions. Adolescents who experience social deprivation tend to have lower levels of self-confidence, which can impact their psychological, academic, and social aspects. Research shows that social isolation can lead to increased stress, anxiety, and a higher risk of depression (Haney, 2003; Kaba et al., 2014).

The phenomenon of social deprivation was also found in a preliminary study conducted in Pangandaran. This study revealed that students with economic limitations tend to feel inferior and reluctant to interact with their friends. This happens because of social stigma and striking differences in economic conditions in the school environment. For example, a student from a disadvantaged family may feel insecure about socializing because they feel that their appearance is not comparable to that of their more capable peers. Another case shows that students with high levels of intelligence still feel less confident because they have less than ideal bodies. As a result, they avoid social interaction, often skip school, and experience decreased academic achievement.

By understanding the importance of self-confidence and the impact of social deprivation on adolescent development, a valid and reliable instrument is needed to measure student confidence in the context of social deprivation. An instrument for analyzing self-confidence has been developed by Amir (2015) and Baćanac et al., (2014) who focus on athlete confidence; Bopp & Vadeboncoeur (2019) who developed an instrument of motivation and confidence of adolescents to perform physical activity and exercise; and Rusmana et al. (2020) which develops the confidence instruments of elementary school students in poetry learning.

Although several self-confidence instruments have been developed for athletes, elementary school students, and physical activity contexts, these instruments were designed for specific populations and purposes that differ from the characteristics of high school students experiencing social deprivation. Existing instruments generally assess self-confidence as a broad psychological construct without considering the unique challenges associated with social deprivation, such as social isolation, perceived social exclusion, economic disadvantage, and limited social interaction. Consequently, there is currently no validated instrument specifically designed to measure self-confidence among high school students who experience social deprivation. This gap highlights the need to develop a context-specific instrument capable of capturing the distinctive dimensions of self-confidence within this vulnerable population. The various instruments developed do not focus on adolescents in high school, especially those who experience social deprivation. Thus, there is a research opportunity to develop student confidence instruments with social deprivation.

A good instrument must be able to provide an accurate picture of the student's level of confidence and the factors that affect it. One of the methods that can be used in the development of this instrument is the Rasch Model. This model allows for a more objective and accurate analysis in measuring psychological aspects, including self-confidence. Unlike classical test theory, the Rasch Model provides detailed information regarding item difficulty, person ability, reliability, and item fit, thereby strengthening the psychometric quality of the instrument. Therefore, research focusing on the development of student confidence instruments with social deprivation through the Rasch Model is very important to be conducted. The results of this study are expected to contribute to the field of education, especially in interventions to increase the confidence of students who experience social deprivation.

2. Method

2.1. Research Design and Participant

This study uses a quantitative approach with a survey method through an online questionnaire. The choice of this approach is based on the need to obtain objective, measurable, and statistically analyzable data. The quantitative approach allows researchers to develop valid and reliable instruments by testing the quality of statement items based on statistical analysis (Creswell, 2012; Creswell & Creswell, 2018). This method allows the evaluation of factor structure, internal consistency, as well as the degree of suitability of the instrument in measuring the constructed under study (Ramdani et al., 2020; Wongwiwatthanakit, 2002).

The inclusion criteria for participants were: (1) being enrolled as an active high school student, (2) being aged between 15 and 17 years, (3) demonstrating indications of social deprivation based on self-report

screening results and teacher recommendations, and (4) voluntarily agreeing to participate in the study. Students who did not complete the questionnaire or did not meet the screening criteria were excluded from the analysis.

Sampling was conducted using purposive sampling, which allows researchers to select participants with specific characteristics relevant to the research objectives (Creswell & Creswell, 2018). Participant identification was conducted through self-report screening and recommendations from guidance and counseling teachers. Teachers provided recommendations based on their observations of students who exhibited low self-confidence, social withdrawal, or difficulties in social interaction. The characteristics of the participants are presented in Table 1.

Table 1. Research Participants

No.	Participant	Gender		Total
		Male	Female	
1	School 1	138	228	366
2	School 2	5	25	30
Total		143	253	396

Instrument was developed through six stages: (1) conceptualization of constructs, (2) operational definition, (3) instrument grid preparation, (4) statement item development, (5) expert judgment, and (6) readability testing and initial validation (Table 2). The development process was designed to produce an instrument that accurately measures self-confidence among students experiencing social deprivation.

2.2. Instrument Development and Content Validity

The development of the self-confidence instrument followed a systematic process to ensure its conceptual relevance and psychometric quality. The instrument was specifically designed to measure self-confidence among students experiencing social deprivation. Table 2 presents the stages of instrument development.

Table 2. Stages of Self-Confidence Instrument Development for Students with Social Deprivation

Phase	Stage	Description
1	Conceptualization of Constructs	Identifying the self-confidence construct of students with social deprivation through literature review and theoretical analysis to determine the key dimensions.
2	Operational Definition	Defining self-confidence operationally and establishing measurable dimensions and indicators relevant to students with social deprivation.
3	Instrument Grid Preparation	Developing an instrument blueprint that includes dimensions, indicators, and statement item specifications.
4	Statement Item Development	Constructing positive and negative statement items based on the blueprint and aligning them with the Rasch measurement model.
5	Expert Judgment	Evaluating content validity through expert review and revising items based on feedback.
6	Readability Test and Initial Validation	Conducting readability testing and preliminary Rasch analysis to assess reliability, item difficulty, and model fit.

To establish content validity, the preliminary instrument was evaluated by experts in educational psychology, guidance and counseling, and educational measurement. The experts reviewed the relevance, clarity, and representativeness of each item in relation to the construct being measured. Their feedback was used to revise ambiguous wording, improve item clarity, and ensure alignment between indicators and instrument items before field testing.

The development process was designed to produce an instrument that accurately reflects the characteristics of students experiencing social deprivation. The use of the Rasch Model enabled the evaluation of item quality and ensured that each statement functioned appropriately across different respondent ability levels.

2.3. Data Collection and Analysis

The collection of research data was carried out through the dissemination of online questionnaires using Google Form. The data that has been collected is then analyzed descriptively to find out the picture of the research participants using Ms Excel. Data analysis was also carried out through the application of the Rasch Model with Winsteps software version 3.73 which assisted researchers in obtaining the distribution tendencies of research participants and testing the validity and reliability of instruments (Boone et al., 2014; Planinic et al., 2019; Sumintono & Widhiarso, 2015).

To obtain an overview of the participants and the level of validity and reliability of the instrument, first, a rating scale test was carried out to verify whether the scale used was understandable or confusing to respondents. The results were shown through the observation average and the Andrich *threshold*. Furthermore, the analysis of the assumption of unidimensionality and measurement independence that tested the instrument actually measured student confidence.

The third stage in analyzing research data is to test the suitability of participants (*person fit*) to determine the ability of participants to answer statements consistently and clearly. After that, each item in the instrument is analyzed through a *fit item* to determine the level of validity and reliability of the student's confidence instrument.

2.4. Research Ethics

During the research process, researchers adhere to the principles of research ethics to ensure the protection of participants. Research ethics are very important, especially when involving students and teachers as participants. In this case, researchers must maintain trust and ensure that participants' rights are protected. Patton (2002) raised several ethical issues relevant in the research, such as reciprocity, risk assessment, confidentiality, informed consent, and data access and ownership. Therefore, this study applies ethical principles, including obtaining participation permits, maintaining data privacy and confidentiality, and paying attention to the power relationship between researchers and participants.

Gaining consent is an important aspect of this study. The researcher provided the participants with a written consent document that included information related to the research objectives, data sensitivity, and data protection measures, such as the use of pseudonyms and restrictions on the dissemination of images. In addition, the privacy and confidentiality aspect is maintained through permission to use electronic devices, such as recorders or cameras, provided that the images taken do not show the participant's face. In terms of power relations, the researcher is aware of the potential for the dominance of his perspective over students' views. Therefore, the researcher seeks to reconfirm the conclusions made to match the participants' experiences and understandings.

3. Results and Discussion

3.1. Self-Confidence Instrument

The confidence instrument in this study is based on the theory Lindenfield (2011), which defines self-confidence as an individual's belief in his or her ability to positively assess himself or herself and his environment in order to achieve academic success through personal effort. Self-confidence consists of two dimensions, namely inner confidence and innate confidence.

The dimension of inner self-confidence includes four aspects including self-love, self-understanding, clear goals, and positive thinking. Self-love involves respect for physical and spiritual needs, while self-understanding reflects an awareness of potential and openness to criticism. Clear goals are characterized by high motivation and the ability to determine the direction of life, while positive thinking reflects hope and confidence in facing challenges.

Confidence is born to include aspects of communication, self-appearance, assertiveness, and control of feelings. Good communication allows individuals to express their opinions clearly, while a polite self-appearance increases social acceptance. Assertiveness is characterized by assertiveness and the ability to compromise, while mood control helps individuals face challenges stably. The confidence instrument in this study consisted of 48 statements arranged in the form of a structured questionnaire with a Guttman scale, in which the respondents chose the answer "Yes" or "No" according to their characteristics which can be seen in Table 2. On Table 2, IDN is item on Bahasa Indonesia, ENG is item on English.

Table 2. Instruments of Confidence

NO	ITEM	OUTFIT		PT. MEASURE	
		MNSQ	ZSTD	CORR.	EXP.
1	IDN: <i>Saya mampu menampilkan diri saya dengan baik.</i> ENG: I am able to present myself well.	.75	-1.7	.55	.39
2	IDN: <i>Saya bangga dengan penampilan fisik saya.</i> ENG: I am proud of my physical appearance.	1.22	1.7	.33	.43
3	IDN: <i>Saya merasa senang ketika orang lain memperhatikan saya.</i> ENG: I feel happy when people pay attention to me.	1.30	3.0	.40	.46
4	IDN: <i>Saya mampu mengerjakan pekerjaan rumah tanpa bantuan orang lain.</i> ENG: I can complete my homework without help from others.	1.31	2.8	.36	.45
5	IDN: <i>Saya mengetahui kekurangan dan kelebihan diri saya.</i> ENG: I am aware of my strengths and weaknesses.	1.13	1.0	.41	.42

NO	ITEM	OUTFIT		PT. MEASURE	
		MNSQ	ZSTD	CORR.	EXP.
6	IDN: Saya bangun pagi dengan semangat karena saya tahu apa yang harus saya lakukan. ENG: I wake up in the morning with enthusiasm because I know what I need to do.	1.28	2.6	.30	.45
7	IDN: Saya optimis terhadap hasil pekerjaan sekolah saya. ENG: I am optimistic about the results of my schoolwork.	1.06	.5	.43	.42
8	IDN: Saya memilih langsung pulang ke rumah daripada menerima ajakan teman untuk nongkrong sepulang sekolah. ENG: I choose to go straight home rather than accept my friends' invitations to hang out after school.	1.23	1.8	.31	.42
9	IDN: Saya mampu mencapai tujuan yang saya perjuangkan. ENG: I am capable of achieving the goals I am striving for.	.94	-.3	.46	.39
10	IDN: Saya memiliki peluang besar untuk berhasil. ENG: I have a great chance of being successful.	.97	-.1	.37	.37
11	IDN: Saya tidak menyontek saat ujian meskipun saya tidak tahu jawabannya. ENG: I do not cheat on tests even if I do not know the answers.	1.35	3.2	.38	.45
12	IDN: Saya terbiasa mendengarkan terlebih dahulu sebelum menyampaikan pendapat. ENG: I am used to listening before expressing my opinion.	1.13	.7	.30	.35
13	IDN: Saya menyampaikan pendapat dalam diskusi kelas tanpa ragu. ENG: I express my opinions in class discussions without hesitation.	1.07	.9	.43	.48
14	IDN: Saya tidak malu berbicara di depan banyak orang. ENG: I am not shy about speaking in front of a large audience.	1.36	2.8	.29	.47
15	IDN: Saya mampu jika ditunjuk menjadi pemimpin/petugas upacara. ENG: I am capable if chosen to be a ceremony leader or officer.	1.24	2.0	.35	.47
16	IDN: Saya terbiasa mengenakan seragam sekolah dengan rapi. ENG: I am used to wearing my school uniform neatly.	.98	.0	.34	.34
17	IDN: Saya mengenakan pakaian yang sopan dan pantas di sekolah. ENG: I wear polite and appropriate clothing at school.	.85	-.7	.45	.35
18	IDN: Saya mengenakan pakaian yang sesuai dengan kegiatan yang saya lakukan. ENG: I wear clothes that match the activities I am doing.	.82	-.8	.39	.32
19	IDN: Saya tegas menentang teman yang melanggar peraturan sekolah. ENG: I firmly stand against friends who break school rules.	1.05	.6	.43	.47
20	IDN: Saya terlibat dalam diskusi di kelas untuk mencapai kesepakatan dengan teman-teman saya. ENG: I engage in discussions in class to reach agreements with my friends.	1.11	.6	.33	.36
21	IDN: Saya bersyukur atas pujian yang diberikan orang lain kepada saya. ENG: I express gratitude when others compliment me.	.86	-.7	.46	.35
22	IDN: Saya berani ditugaskan mengikuti perlombaan mewakili teman-teman sekelas di sekolah. ENG: I am confident in representing my classmates in competitions.	1.42	4.3	.26	.48
23	IDN: Saya tetap tenang meskipun sedang merasa sedih. ENG: I remain calm even when I am feeling sad.	1.45	3.2	.34	.42
24	IDN: Saya dapat membuat teman-teman merasa nyaman di dekat saya meskipun saya sedang menghadapi banyak masalah. ENG: I can make my friends feel comfortable around me even when I am facing many problems.	1.13	.8	.30	.37
25	IDN: Saya malas merawat penampilan saya. ENG: I am lazy about maintaining my appearance.	.89	-.8	.46	.46
26	IDN: Saya merasa tidak percaya diri dengan penampilan fisik saya. ENG: I feel insecure about my physical appearance.	1.19	1.1	.38	.44
27	IDN: Saya merasa malu ketika orang lain memperhatikan saya. ENG: I feel embarrassed when people pay attention to me.	.74	-.8	.45	.36
28	IDN: Saya panik ketika diminta menjawab pertanyaan di depan kelas tanpa persiapan. ENG: I panic when asked to answer a question in front of the class without preparation.	.68	-.7	.35	.30
29	IDN: Saya marah ketika teman mengkritik saya. ENG: I get angry when a friend criticizes me.	1.08	.5	.49	.42
30	IDN: Saya merasa tidak bersemangat ketika bangun tidur karena bosan dengan rutinitas saya. ENG: I feel unmotivated when I wake up because I am bored with my routine.	.92	-.3	.45	.39
31	IDN: Saya ragu dengan kemampuan saya untuk meraih peringkat tinggi di kelas. ENG: I doubt my ability to achieve a high rank in class.	.91	-.2	.38	.37
32	IDN: Saya mengikuti kegiatan ekstrakurikuler di sekolah hanya karena teman-teman saya mengikutinya. ENG: I join extracurricular activities at school just because my friends do.	.88	-.5	.48	.42
33	IDN: Saya merasa ragu untuk melanjutkan studi saya. ENG: I feel uncertain about continuing my studies.	.84	-.7	.48	.40

NO	ITEM	OUTFIT		PT. MEASURE	
		MNSQ	ZSTD	CORR.	EXP.
34	IDN: <i>Saya tidak percaya diri dengan kemampuan saya sendiri.</i> ENG: I am not confident in my own abilities.	.85	-.4	.40	.35
35	IDN: <i>Saya tidak dapat menyelesaikan masalah yang saya hadapi tanpa bantuan orang lain.</i> ENG: I cannot solve my problems without help from others.	.72	-1.5	.51	.42
36	IDN: <i>Saya terkadang menyela pembicaraan teman-teman saya.</i> ENG: I sometimes interrupt conversations with my friends.	.44	-2.6	.55	.38
37	IDN: <i>Saya diam saja saat diskusi kelas.</i> ENG: I remain silent during class discussions.	.62	-2.3	.58	.43
38	IDN: <i>Saya merasa malu menyampaikan pendapat di depan banyak orang.</i> ENG: I feel shy about expressing my opinion in front of many people.	.46	-1.8	.46	.33
39	IDN: <i>Saya merasa sulit berkomunikasi dengan orang lain.</i> ENG: I find it difficult to communicate with others.	.48	-2.7	.58	.40
40	IDN: <i>Saya merasa kerapian dalam penampilan itu tidak penting.</i> ENG: I feel that neatness in appearance is not important.	.63	-2.6	.60	.45
41	IDN: <i>Saya tidak peduli dengan pakaian yang saya kenakan.</i> ENG: I do not care about the clothes I wear.	.89	-.7	.54	.45
42	IDN: <i>Saya mengenakan pakaian dengan warna yang tidak serasi.</i> ENG: I wear clothes with clashing colors.	.64	-2.7	.60	.45
43	IDN: <i>Saya terkadang tidak setuju dalam diskusi tanpa alasan yang jelas.</i> ENG: I sometimes disagree in discussions without any reason.	.77	-1.0	.46	.41
44	IDN: <i>Saya memaksa teman-teman sekelas untuk menyetujui keinginan pribadi saya.</i> ENG: I force my classmates to agree with my personal desires.	.96	-.2	.52	.46
45	IDN: <i>Saya bersikap rendah hati.</i> ENG: I have a humble attitude.	1.47	1.1	.22	.29
46	IDN: <i>Saya gugup ketika sedang bingung.</i> ENG: I get nervous when I am confused.	1.31	.7	.13	.25
47	IDN: <i>Saya merasa putus asa ketika menghadapi kesulitan keuangan.</i> ENG: I feel hopeless when facing financial difficulties.	.83	-.6	.35	.38
48	IDN: <i>Saya melampiaskan amarah saya dengan menangis.</i> ENG: I release my anger by crying.	1.50	1.5	.18	.36

3.2. Rating Scale Diagnostics

Rating scale diagnostics In the analysis of the Rasch Model aims to evaluate the effectiveness of scale categories in measurement instruments (Sumintono & Widhiarso, 2015). This process involves analyzing the distribution of respondents on categories, functions, and monotonicity categories, and Threshold between categories. In this study, the alternative answers used were 0 and 1 to measure students' confidence with social deprivation. The clarity of the difference in answers is understood by the respondent if the Consistency There has been a consistent increase in the 0 and 1 answer categories (Lerdal et al., 2014). The results of the analysis in Table 3. indicates that the answer categories 0 and 1 can be clearly understood by the participants, so this instrument is considered valid for measuring students' confidence with social deprivation.

Table 3. Rating Scale Diagnostics

Category	Observed	Obsvd	Sample	Infit	Outfit	Consistency		Estimate		
Label score	Count	%	Avrge	Expect	Mnsq	Mnsq	M->c	C->m	Rmsr	Discr
0	0	11358	60	-1.95	-1.94	1.00	1.09	85%	85%	.3146
1	1	7650	40	1.08	1.08	.99	1.01	78%	77%	.4037

3.3. Unidimensionality Analysis

Unidimensionality analysis aims to identify the number of attributes or dimensions measured by an instrument (Planinic et al., 2019; Sumintono & Widhiarso, 2015). In this study, the analysis was carried out using Output Table 23, which considered the Raw variance explained by measures and Unexplained variance in 1st to 5th contrast of residuals. An instrument can be considered to have good unidimensionality if Raw variance explained by measures $\geq 20\%$ (with criteria: enough if 20-40%, good if 40-60%, and very good if $>60\%$) as well as Unexplained variance in 1st to 5th contrast of residuals each $< 15\%$ (Sumintono & Widhiarso, 2015).

Based on the results of data analysis in Table 4, the raw variance explained by measures was 48.1%, which is included in the 'good' category, indicating that the proportion of variance that can be explained by the instrument is quite high. In addition, the Unexplained variance in 1st to 5th contrast of residuals was 8.8%, 6.6%, 3.6%, 2.3%, and 1.9%, all of which were below the 15% threshold. This indicates that there are no other dominant dimensions in the residual, so it can be concluded that this instrument does measure one main

construct, namely student confidence with social deprivation. Thus, this instrument can be said to have good unidimensionality validity in measuring the concept in question.

Table 4. Unidimensionality

		--	Empirical	--	Modeled
Total raw variance in observations	=	92.5	100.0%		100.0%
Raw variance explained by measures	=	44.5	48.1%		47.7%
Raw variance explained by persons	=	12.0	13.0%		12.9%
Raw Variance explained by items	=	32.5	35.1%		34.8%
Raw unexplained variance (total)	=	48.0	51.9%	100.0%	52.3%
Unexplained variance in 1st contrast	=	8.1	8.8%		16.9%
Unexplained variance in 2nd contrast	=	6.1	6.6%		12.7%
Unexplained variance in 3rd contrast	=	3.3	3.6%		6.9%
Unexplained variance in 4th contrast	=	2.1	2.3%		4.4%
Unexplained variance in 5th contrast	=	1.8	1.9%		3.7%

3.4. Person-Fit

Participant suitability explains the consistency of participants in answering statements logically and stably. Unfit or outlier participants exhibit inconsistencies in response patterns to instrument construction, which may indicate inconsistencies in answering or other factors such as misunderstanding of statements in instruments. Therefore, responses from unfit participants generally need to be further analyzed or eliminated in order for measurement results to be more accurate.

The determination of fit and person fit items in this study refers to the following criteria: (1) The accepted Outfit Mean Square (MNSQ) value is $0.5 < \text{MNSQ} < 1.5$; (2) The accepted Z-standard Outfit (ZSTD) value is $-2.0 < \text{ZSTD} < +2.0$; and (3) the Point Measure Correlation (Pt Measure Corr) value is in the range of $0.4 < \text{Pt Measure Corr} < 0.85$ (Boone et al., 2014; Sumintono & Widhiarso, 2014). A respondent is declared fit if he meets at least one of the three criteria that have been set (Sumintono & Widhiarso, 2015).

Based on the results of data analysis in Table 4, out of a total of 396 participants who filled out the questionnaire, it was found that 87 participants were not fit according to the predetermined criteria. Therefore, the responses of these participants were eliminated in further analysis. Thus, the number of participants who were considered fit and consistent in answering according to their abilities was 309 people. This shows that the majority of participants can understand the instrument well, so that this instrument can be used to measure students' confidence with social deprivation in a valid and reliable manner.

3.5. Validity and Reliability Test

The suitability of the items in the instrument indicates whether each item of the statement functions properly in measuring the construct in question. If an item is declared misfit, this indicates a misconception or inconsistency in the response pattern with the measurement model, so that it can be an evaluation material for researchers to improve the quality of the instrument (Sumintono & Widhiarso, 2015).

The determination of fit items in this study refers to the following criteria: (1) The Outfit Mean Square (MNSQ) value received is in the range of $0.5 < \text{MNSQ} < 1.5$; (2) The accepted Z-standard Outfit (ZSTD) value is in the range of $-2.0 < \text{ZSTD} < +2.0$; and (3) The accepted Point Measure Correlation (Pt Measure Corr) value was $0.4 < \text{Pt Measure Corr} < 0.85$ (Boone et al., 2014; Sumintono & Widhiarso, 2014). An item is said to be fit if it meets at least one of the three criteria (Sumintono & Widhiarso, 2015).

In addition, the item fit analysis also considers the unidimensionality of the instrument to ensure that the instrument measures one key attribute, namely student confidence with social deprivation. In this case, unidimensionality was tested by looking at the Raw Variance Explained by Measures and Unexplained Variance in 1st to 5th Contrast values based on Output Table 23. The instrument is considered to have good unidimensionality if the Raw Variance Explained by Measures $\geq 20\%$, with the following interpretation criteria: adequate (20-40%), good (40-60%), and very good ($>60\%$). In addition, the Unexplained Variance in 1st to 5th Contrast of Residuals should be $<15\%$ (Sumintono & Widhiarso, 2015).

Based on the results of the analysis, out of a total of 48 items in the instrument, all items met the item fit criteria, so there were no misfit items. This shows that each statement item functions optimally in measuring students' confidence with social deprivation. Thus, this instrument can be said to have good validity and can be used for further research.

A reliable instrument is one that, when used on the same individual under similar conditions albeit at different times, produces scores that tend to be stable and consistent (Sumintono & Widhiarso, 2015). The

reliability of the instruments in this study can be analyzed through statistics that reflect the quality of the response pattern of the respondent (person), the quality of the instrument (item), and the interaction between person and item, as shown in Table 5 Summary Statistics.

Table 5. Summary Statistics

Remarks	Infit MNSQ	Infit ZSTD	Outfit MNSQ	Outfit ZSTD	Reliability	Separation	Cronbach Alpha
Person	1.00	-0.2	0.99	-0.2	0.87	2.60	0.70
Item	0.98	0.0	0.99	0.2	0.99	10.17	

To assess the reliability of an instrument, there are several main criteria used. One of them is the Person Measure value, where an average log value greater than 0.0 indicates a tendency for respondents to answer statements optimistically. In addition, the reliability of the instrument can also be reviewed from the Alpha Cronbach value, which reflects the overall interaction between the respondent and the item of the statement. In this study, the Alpha Cronbach value of 0.89, which is in the very good category, shows that the level of reliability of the instrument in measuring students' confidence with social deprivation is very high.

Other aspects that are indicators of reliability are the Person Reliability and Item Reliability values. The Person Reliability value obtained in this study was 0.87, which is included in the good category. Although the Item Reliability value is not explicitly presented in the table, if it follows the reliability pattern of the person, it can be said to be in the range of good to very good categories. The high reliability value indicates that this instrument has stability in providing consistent results to different respondent samples.

In addition, the results of the analysis in Table 5. show that the Person Separation value is 2.60. This value indicates that the instrument has a good ability to distinguish respondents based on their level of confidence. The greater the separation value, the better the instrument in grouping respondents according to the variation in their confidence level. The average Person Measure obtained was -0.77 logits, which indicates that most of the respondents in this study had a lower level of confidence compared to the neutral point (0.0 logit).

3.6. Discussion

Analysis results Rating Scale Diagnostics It shows that the answer categories used in this instrument work well in measuring students' confidence with social deprivation. Infit value and Dressing Up (MNSQ) is in the acceptable range, i.e. 0.99–1.09, indicating that there is no significantly deviant response pattern (Linacre, 2000). The high coherence values further support the appropriateness of the dichotomous response format for this population.

Beyond the technical adequacy of the rating scale, the findings provide important insights into the confidence characteristics of students experiencing social deprivation. The person measure mean of -0.77 logits indicates that, on average, respondents were located below the average item difficulty level. In the Rasch framework, negative person measures suggest that participants tended to endorse fewer confidence-related statements, reflecting a generally low level of self-confidence. This finding is consistent with previous studies indicating that social deprivation is often associated with feelings of inferiority, social withdrawal, and reduced self-belief.

Furthermore, these results are in line with previous research which shows that scales with clear and limited categories can improve the reliability and validity of measurements in psychometrics (Sumintono & Widhiarso, 2015). These findings confirm that the use of two answer categories in this instrument allows for effective mapping of confidence levels, particularly for students who experience social deprivation. Thus, this instrument can be used more widely in research related to the development of confidence in vulnerable populations, supporting the effectiveness of the Rasch Model approach in evaluating psychological attributes quantitatively (Boone, Staver, & Yale, 2014).

In addition, the value of Raw variance explained by persons of 13.0% and Raw variance explained by items of 35.1% indicates that the contribution of individuals and items in this instrument is quite balanced in explaining total variance, which is an important indicator in the validity of unidimensionality (Bond & Fox, 2015). These results are consistent with previous studies that confirmed that instruments that have low unexplained variance values in the first to fifth contrast tend to be more accurate in measuring one key dimension (Linacre, 2012).

Furthermore, the value of the unexplained variance that is below the 15% threshold indicates that there are no significant hidden patterns in the residuals, thus supporting the assumption of unidimensionality (Sumintono & Widhiarso, 2015). This confirms that this instrument can be validly used to measure students' confidence with social deprivation in the absence of interference from other factors not identified in the model. Thus, these findings provide empirical evidence that the developed instrument has a clear and reliable structure

in psychometric research, particularly in measuring confidence levels among students with social limitations (Boone, Staver, & Yale, 2014).

On the results Person fit, demonstrating consistency with previous research confirming that elimination of unfit participants can improve the validity and reliability of the instrument (Linacre, 2012). In addition, further analysis of the response patterns of unfit participants showed the possibility of several factors influencing the inconsistency of the answers, such as a lack of understanding of the item of the statement or the tendency to answer randomly (Meijer & Sijtsma, 2001). This indicates that although most participants can understand and answer consistently, there are a small number of individuals who may have difficulty understanding the concepts being measured.

The negative average person measure further suggests that self-confidence remains a significant challenge among adolescents experiencing social deprivation. Students who experience social exclusion, economic disadvantage, or perceived social inferiority may develop doubts about their abilities and social worth. Consequently, interventions aimed at strengthening self-confidence should become a priority within school counseling programs.

The item hierarchy generated by the Rasch analysis can also provide valuable information regarding which aspects of self-confidence are most problematic for students. Items with higher difficulty levels represent aspects of confidence that are more difficult for students to endorse. If the most difficult items are related to communication, this would indicate that students struggle to express opinions and interact socially. If appearance-related items dominate the higher logit range, concerns about physical appearance and social comparison may represent the primary source of low confidence. Similarly, if assertiveness items are the most difficult, students may experience challenges in expressing personal rights, refusing negative peer pressure, or defending their opinions. Therefore, future interpretation of the Wright Map and item difficulty hierarchy is essential for identifying the specific dimensions of confidence that require intervention.

The validity and reliability test of student confidence instruments with social deprivation showed that instruments that have high validity and reliability can be used as a reliable measuring tool in identifying certain psychological constructs, such as confidence in students with social deprivation (Boone et al., 2014; Linacre, 2012). By meeting the item fit criteria, this instrument shows that each statement item has functioned according to the Rasch model, so that it can measure the construct accurately and does not contain biases that can reduce the validity of the measurement (Sumintono & Widhiarso, 2015).

In addition, the high reliability value, both in terms of person and item, suggests that this instrument can produce consistent data when used in a variety of different samples or times (Wright & Masters, 1982). A good person separation value also indicates that this instrument has a fairly high discriminating power in classifying individuals based on their level of confidence. Therefore, this instrument can be recommended for further research or as an assessment tool in psychological interventions to understand and improve the self-confidence of students against a background of social deprivation.

3.7. Implementations

The developed instrument has practical implications for guidance and counseling services in schools. Guidance and counseling teachers can use the instrument as an initial screening tool to identify students who experience low self-confidence related to social deprivation. The measurement results can assist counselors in classifying students according to their confidence levels and determining the intensity of intervention required.

In addition, the item-level information generated through Rasch analysis allows counselors to identify specific areas of weakness. For example, students who show difficulties in communication-related items may benefit from social skills training, whereas students with difficulties in appearance-related confidence may require interventions focused on self-acceptance and positive self-image. Students with low assertiveness scores may benefit from assertiveness training and peer-support programs. Thus, the instrument can support data-driven counseling practices and more targeted intervention planning.

The instrument may also be used for monitoring and evaluating counseling programs. Repeated administration can help teachers assess changes in students' confidence levels following interventions and determine program effectiveness over time.

3.8. Limitations

Several limitations should be acknowledged. First, the participants were drawn from only two high schools in Pangandaran Regency, which may limit the generalizability of the findings to other regions and educational contexts. Second, the instrument relied on self-report responses, which may be influenced by social desirability bias and individual interpretation of questionnaire items.

Third, although the Rasch Model provides strong evidence of validity and reliability, the present study focused primarily on psychometric evaluation and did not examine relationships between self-confidence and other psychological variables, such as academic achievement, resilience, or social support. Finally, the study did not conduct differential item functioning (DIF) analysis to examine potential item bias across gender or other demographic groups. Future research should involve larger and more diverse samples, include DIF analysis, and explore the predictive validity of the instrument across different educational settings.

4. Conclusion

Based on the results of the study, the instrument used in measuring student confidence with social deprivation has been proven to be valid and reliable. Analysis of rating scale diagnostics showed that response categories 0 and 1 were well understood by respondents, supporting the validity of the instrument. The unidimensionality of the instrument has also been confirmed, with the raw variance explained by measures of 48.1%, indicating that the instrument accurately measures one major construct. In addition, the reliability of the instrument is high with an Alpha Cronbach value of 0.89 and a Person Reliability of 0.87. Therefore, this instrument can be used in further research to understand the factors that affect students' confidence with social deprivation.

Author Contributions

All authors contributed equally to this paper. All authors have read and approved the final manuscript.

Funding

No funding support was received.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

Data Availability

The datasets generated during and/ or analyzed during the current study are available from the corresponding author on reasonable request.

Declaration on AI Use

The authors declare that no artificial intelligence (AI) or AI-assisted tools were used in the preparation of this manuscript.

References

- Akbari, O., & Sahibzada, J. (2020). Students' self-confidence and its impacts on their learning process. *American International Journal of Social Science Research*, 5(1), 1–15. <https://doi.org/10.46281/aijssr.v5i1.462>
- Amir, N. (2015). Instrument development of self-confidence for badminton athletes. *ANIMA Indonesian Psychological Journal*, 30(2), 101–110. <https://doi.org/10.24123/aipj.v30i2.539>
- Andrich, D. (2011). *Rasch models for measurement*. Sage. <https://doi.org/10.4135/9781412985598>
- Baćanac, L., Miličević-Marinković, B., Kasum, G., & Marinković, M. (2014). Competitive anxiety, self-confidence and psychological skills in top athletes with and without disabilities: A pilot study. *Facta Universitatis: Physical Education & Sport Series*, 12(2), 59–70.
- Bénabou, R., & Tirole, J. (2002). Self-confidence and personal motivation. *Quarterly Journal of Economics*, 117(3), 871–915. <https://doi.org/10.1162/003355302760193913>
- Bengtsson, C., Persson, M., & Willenhag, P. (2005). Gender and overconfidence. *Economics Letters*, 86(2), 199–203. <https://doi.org/10.1016/j.econlet.2004.07.012>
- Blakemore, S.-J., & Mills, K. L. (2014). Is adolescence a sensitive period for sociocultural processing? *Annual Review of Psychology*, 65, 187–207. <https://doi.org/10.1146/annurev-psych-010213-115202>
- Boone, W. J., Yale, M. S., & Staver, J. R. (2014). *Rasch analysis in the human sciences*. Springer. <https://doi.org/10.1007/978-94-007-6857-4>
- Bopp, T., & Vadeboncoeur, J. D. (2019). Assessing affective physical literacy of adolescents: The development of a motivation and confidence in sport and physical activity instrument. *Journal of Physical Education and Sports Management*, 6(2), 56–69. <https://doi.org/10.15640/jpesm.v6n2a7>
- Clément, R., Dörnyei, Z., & Noels, K. A. (1994). Motivation, self-confidence, and group cohesion in the foreign language classroom. *Language Learning*, 44(3), 417–448. <https://doi.org/10.1111/j.1467-1770.1994.tb01113.x>
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.

- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage.
- Egan, A. (2019). *Confidence in critical thinking: Developing learners in higher education*. Routledge. <https://doi.org/10.4324/9781315163123>
- Gorsy, C., & Panwar, N. (2015). Study of self-confidence as a correlate of peer-relationship among adolescents. *International Journal of Education & Management Studies*, 5(4), 298–301.
- Gottlieb, M., Chan, T. M., Zaver, F., & Ellaway, R. (2022). Confidence-competence alignment and the role of self-confidence in medical education: A conceptual review. *Medical Education*, 56(1), 37–47. <https://doi.org/10.1111/medu.14592>
- Haney, C. (2003). Mental health issues in long-term solitary and “supermax” confinement. *Crime & Delinquency*, 49(1), 124–156. <https://doi.org/10.1177/0011128702239239>
- Hoffman, M. A., Ushpiz, V., & Levy-Shiff, R. (1988). Social support and self-esteem in adolescence. *Journal of Youth and Adolescence*, 17, 307–316. <https://doi.org/10.1007/BF01537672>
- Kaba, F., Lewis, A., Glowa-Kollisch, S., Hadler, J., Lee, D., Alper, H., Selling, D., MacDonald, R., Solimo, A., Parsons, A., et al. (2014). Solitary confinement and risk of self-harm among jail inmates. *American Journal of Public Health*, 104(3), 442–447. <https://doi.org/10.2105/AJPH.2013.301742>
- Kennedy, K. J., Pavlova, M., & Lee, J. C.-K. (2022). *Skills agendas in the 21st century: Soft skills and hard values: Meeting education's 21st century challenges*. Routledge. <https://doi.org/10.4324/9781003219415>
- Kukulu, K., Korukcu, O., Ozdemir, Y., Bezci, A., & Calik, C. (2013). Self-confidence, gender and academic achievement of undergraduate nursing students. *Journal of Psychiatric and Mental Health Nursing*, 20(4), 330–335. <https://doi.org/10.1111/j.1365-2850.2012.01924.x>
- Lerdal, A., Fagermoen, M. S., Bonsaksen, T., Gay, C. L., & Kottorp, A. (2014). Rasch analysis of the sense of coherence scale in a sample of people with morbid obesity: A cross-sectional study. *BMC Psychology*, 2(1). <https://doi.org/10.1186/2050-7283-2-1>
- Linacre, J. M. (2000). *Fit diagnosis: Infit outfit mean-square standardized*. Winsteps.com. <https://www.winsteps.com/winman/misfitdiagnosis.htm>
- Linacre, J. M. (2012). *Winsteps® Rasch measurement computer program*. Winsteps.com.
- Lindenfield, G. (2011). *Confident teens: How to raise a positive, confident and happy teenager*. HarperCollins.
- Maretha, A. A., Ibrahim, I., & Said, A. (2016). Self confidence siswa dalam menyelesaikan tugas dan implikasinya terhadap layanan bimbingan dan konseling. *Konselor*, 3(3), 88–93. <https://doi.org/10.24036/02014332988-0-00>
- Markway, B. G., & Ampel, C. (2018). *The self-confidence workbook: A guide to overcoming self-doubt and improving self-esteem*. Althea Press.
- Maxwell, M. (2015). *Psycho-cybernetics updated and expanded*. Tarcher Perigee.
- Mellenbergh, G. J. (1989). Item bias and item response theory. *International Journal of Educational Research*, 13(2). [https://doi.org/10.1016/0883-0355\(89\)90002-5](https://doi.org/10.1016/0883-0355(89)90002-5)
- Nufus, H., Duskri, M., & Bahrin, B. (2018). Mathematical creative thinking and student self-confidence in the challenge-based learning approach. *JRAMathEdu: Journal of Research and Advances in Mathematics Education*, 3(2), 57. <https://doi.org/10.23917/jramathedu.v3i2.6367>
- Orben, A., Tomova, L., & Blakemore, S.-J. (2020). The effects of social deprivation on adolescent development and mental health. *The Lancet Child & Adolescent Health*, 4(8), 634–640. [https://doi.org/10.1016/S2352-4642\(20\)30186-3](https://doi.org/10.1016/S2352-4642(20)30186-3)
- Perry, P. (2011). Concept analysis: Confidence/self-confidence. *Nursing Forum*, 46(4), 218–230. <https://doi.org/10.1111/j.1744-6198.2011.00230.x>
- Planinic, M., Boone, W. J., Susac, A., & Ivanjek, L. (2019). Rasch analysis in physics education research: Why measurement matters. *Physical Review Physics Education Research*, 15(2). <https://doi.org/10.1103/PhysRevPhysEducRes.15.020111>
- Ramdani, R., Hanurawan, F., Ramli, M., Lasan, B. B., & Afdal, A. (2020). Development and validation of Indonesian academic resilience scale using Rasch models. *International Journal of Instruction*, 14(1). <https://doi.org/10.29333/iji.2021.1417a>
- Rusmana, N., Hafina, A., Wardhany, R. O., & Suryana, D. (2020). Students' confidence instrument analysis in poetry learning through Rasch model. *The Open Psychology Journal*, 13(1). <https://doi.org/10.2174/1874350102013010289>
- Salim, A. (2022). General self-confidence and its implication on students' achievement in oral presentation. *JEELS: Journal of English Education and Linguistics Studies*, 2(2), 34–48. <https://doi.org/10.30762/jeels.v2i2.95>
- Stankov, L., & Lee, J. (2014). Quest for the best non-cognitive predictor of academic achievement. *Educational Psychology*, 34(1), 1–8. <https://doi.org/10.1080/01443410.2013.858908>
- Stankov, L., Morony, S., & Lee, Y. P. (2017). Confidence: The best non-cognitive predictor of academic achievement? In *Noncognitive psychological processes and academic achievement* (pp. 19–38). Routledge.
- Stenner, A. J., Fisher, W. P., Jr., Stone, M. H., & Burdick, D. S. (2013). Causal Rasch models. *Frontiers in Psychology*, 4, 536. <https://doi.org/10.3389/fpsyg.2013.00536>

- Sulistyaningsih, R. (2018). The effectiveness of metaphorical techniques in group counseling services to increase student confidence. *Education Journal*, 10(1), 73–86.
- Sumintono, B., & Widhiarso, W. (2015). *Application of Rasch modeling in educational assessment*. Trim Komunikata Publishing House.
- Synthiawati, N. N., & Ma'arif, I. (2021). Survey of students' confidence level in PJO online learning during the Covid-19 pandemic. *SPRINTER: Journal of Sport Science*, 2(3), 230–238. <https://doi.org/10.46838/spr.v2i3.130>
- Ul Hassan, M., & Miller, F. (2019). Discrimination with unidimensional and multidimensional item response theory models for educational data. *Communications in Statistics: Simulation and Computation*. <https://doi.org/10.1080/03610918.2019.1705344>
- Wongwiwatthanakut, S. (2002). Development and validation of an instrument to assess the self-confidence of students enrolled in the advanced pharmacy practice experience. *American Journal of Pharmaceutical Education*, 66(1), 5–19. [https://doi.org/10.1016/S0002-9459\(26\)01318-5](https://doi.org/10.1016/S0002-9459(26)01318-5)