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Developing and validating the survival-safety skills scale (4S): Rasch model analysis

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Abstract

The ability to ensure survival and safety, known as Survival-Safety Skills, is a critical concern for adolescents today. Despite various interpretations, the literature lacks sufficient tools to measure these skills. This study aims to address this gap by developing a valid and reliable Survival-Safety Skills Scale (4S), specifically tailored for adolescents in school settings. To date, no research has discussed an instrument focused on survival-safety skills in this demographic. The study utilized a quantitative approach with participants comprising high school students. Data analysis was conducted using Rasch Model Analysis. The findings indicate that the Survival-Safety Skills Scale (4S) demonstrated strong person reliability, item reliability, and internal consistency, making it a suitable instrument for assessing adolescent survival-safety skills. Out of the 43 items developed, 36 were found to be valid and reliable, with a mix of favorable and unfavorable items. This study introduces an important tool for understanding and assessing adolescents' survival-safety skills. Further research is recommended to examine the scale's validity across diverse school levels, demographic regions, and gender-based analyses.

Keywords: Adolescent safety; Rasch models; reliability; scale development; survival skills; validity.

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1. INTRODUCTION

The need to survive and to get a sense of security (survival-safety need) is essential for every person. According to Maslow (Martin & Loomis, 2013), the most basic human needs are survival and the physiological need to maintain physical life (Abulof, 2017), like food, drink, rest, and oxygen (Yusuf & Nurihsan, 2013). After the physiological needs are covered, the next critical need is the safety need related to self-security, stability (steadiness, strength, and balance), protection, boundaries, and freedom from fear and anxiety (Hall et al., 1998). Safety is fulfilled when someone, in this case, knows that no more danger will befall him, either physically, mentally, or emotionally (Martin & Loomis, 2013).

Adolescence is a developmental phase with the highest frequency of dangerous behaviors that can potentially cause harm to oneself or others (Clark & Lohéac, 2007). These risky behaviors include drug abuse, driving vehicles in an accident-prone manner, sexual and alcohol use, and criminal acts (Côté, 2013). Recent studies have highlighted the significant role of peer influence in shaping adolescent risk-taking behaviors, with peer dynamics playing a crucial role in shaping adolescent behavior, particularly in substance abuse, reckless driving, and unsafe sexual practices (Zhang & Zhu, 2021). Safety-threatening behavior is more prevalent among adolescents with internalizing and externalizing difficulties. Exposure to childhood trauma has been found to increase internalizing and externalizing behavior problems in adolescents, with executive function playing a mediating role in this relationship (Wang et al., 2023). On the other hand, behavior that has a beneficial effect on adolescents will aid in their growth. Adolescents who engage in good behavior will develop a more excellent feeling of accomplishment and social acceptability. These behaviors allow adolescents to exist in a secure environment and contribute to forming their identities (Sinković et al., 2013).

In Indonesia, there are 67 million children with a maximum age of 18. 5.9 million adolescents become drug addicts due to the influence of their closest people. Furthermore,914 narcotics abuse problems and 1,355 suspects have been revealed. Teenagers dealing with legal issues (ABH) reached 1,434, followed by family problems and alternative care, running 857. Pornography and cyber cases got 679; education problems totaled 451. Health cases of narcotics, psychotropics, and addictive substances (Napa) reached 364. Cases of sexual violence with male perpetrators amounted to 103, while female perpetrators amounted to 58. The cases show that many teenagers still cannot survive and do not have a good sense of security. Another case that is still rife among adolescents is sexual violence; the number of sexual violence cases in 2019 exceeded the number of other violence cases, which reached 5,509 cases (Juarni et al., 2020). Responding to existing cases, children's safety skills will considerably aid them in avoiding the hazards of sexual violence and other problems (Neherta, 2017).

The Regulation of the Minister of Education and Culture in Indonesia, number 54 of 2013, indicates the necessity for teenagers to possess survival-safety skills. Prescriptively, the issue of survival-safety skills is also directly related to the Competency Standards for Self-Reliance of Students, especially on ethical behavior, intellectual maturity, peer relationship maturity, and awareness of social responsibility (Setyono & Widodo, 2019). For senior high school level, several indicators related to students' survival-safety skills competence are behaving based on decisions that consider ethical aspects, learning ways to avoid conflict with others, being tolerant of various expressions of self and others, learning ways to make decisions objectively, and strengthen friendships by taking into account the prevailing norms (Gysbers & Henderson, 2014).

One of the competencies included in adolescent personal development is survival-safety skills. Mastery of survival-safety skills will bring them to a prosperous condition, as mentioned in the comprehensive guidance and counseling program (Lapan, 2012; Trevisan & Carey, 2020). Skills, knowledge, abilities, and competencies are indispensable for anyone in the form of life skills. This knowledge is more of a practice and technique than a theory. It is a science as a skill to do and a skill of being (Hawkins et al., 2015).

Safety behavior is a condition of a person resulting from behavior modification and the design of the physical environment to reduce the possibility of danger and accidents (Elfering et al., 2013; Adotey et al., 2025; Fialho et al., 2024). The approach to improving safety and health is the theory of total safety culture as an essential guide to achieving safety excellence (Baruni & Miltenberger, 2024; Chen et al., 2015; Zhang et al., 2024). To strategy that includes the dynamics of injury prevention, safety emerges from a dynamic interaction

between behavior- and environment-based factors and people-based factors. Territorial study of guidance and counseling related to adolescent development to achieve a total safety culture (Hatch et al., 2015).

The humanist Abraham Maslow created the most prevalent theory of human motivation, which is known as the hierarchy of needs theory (Winston, 2016). The categories of requirements are hierarchically structured so that to fulfill needs at a higher level, needs at a lower level must be addressed (Desautels, 2014). A person's drive to meet physiological demands (for survival) comprises fundamental circumstances such as food, drink, water, shelter, and rest. Humans are driven to fulfill their need for security and safety, the need to feel safe and protected from potential threats, after their physiological demands are addressed. While preparing for upcoming physiological needs, a person works proactively to satisfy survival, safety, and security requirements (Stoyanov, 2017).

Appropriate and credible instruments are needed to understand the phenomenon of contextual adolescent survival-safety skills. There are several instruments used to determine current survival-safety skills. However, the scale still has specific limitations when used in Indonesia and for adolescents age. For example, the Street Survival Skills Questionnaire (Denkowski & Denkowski, 2008; Janniro et al., 1994) focuses on the ability to survive on the road. This instrument has limitations in its focus outside the school context, and its validity is too old and has not been retested. Examples of other instruments are personal safety skills instrument that focuses on the safety skills of school students, but are still limited to the elementary school level (Juarni et al., 2020). In particular, until now, there has been no proven safety and survival capability instrument for high school students.

On the other hand, a measuring tool for adolescent survival-safety skills is essential for assessing and finding empirical conditions. Therefore, this research aims to develop and evaluate the psychometric properties of the Survival-Safety Skills Scale (4S) using Rasch Model Analysis. The Rasch model can provide a measuring scale that offers precise data about the quality of people and items (Taufiq et al., 2021). The study has produced accurate and reliable tools that may be used to assess adolescents' capacity to survive and acquire a sense of security.

Various theories underlie survival safety skills, including safety and health improvements (Zin & Ismail, 2012), Abraham Maslow's hierarchy of needs theory (Stoyanov, 2017), and the survival safety team model by Bruce Tuckman (Vaida & Șerban, 2021). Each approach has its characteristics and special focus. First, Safety and health are the outcome of dynamic interactions between environmental behavior and individual variables, according to the idea of safety and health enhancement. To achieve a whole safety culture, person- and behavior-based psychology must be integrated to effectively address the dynamics of injury prevention (Zin & Ismail, 2012).

An adolescent total safety culture requires constant attention to three domains: (1) environmental factors (including equipment, tools, physical layout, procedures, standards, and temperature), (2) people factors (including parental, societal, and adolescent attitudes), and (3) behavioral factors (including safe and risky adolescent activities, as well as concern for the safety of oneself and others). The triangle of variables relating to safety is known as the safety trio (Cui et al., 2013). These three variables are interacting and dynamic. Changes in one aspect eventually affect the other two, thus, for security to be achieved, there must be a strong connection between the three factors.

Furthermore, the most common theory of human motivation is Abraham Maslow's hierarchy of needs (Stoyanov, 2017). Categories of needs are arranged hierarchically. It means that to meet the needs at one stage, the needs at the previous (lower) stage must be fulfilled (Crandall et al., 2020). Through this theory, one's motivation to fulfill physiological needs (for survival) includes the basic requirements for survival, such as food, drink, water, shelter, and sleep. After these needs can be controlled, humans are motivated by safety and security needs, the desire to feel safe and protected from danger in the future. When preparing for future physiological needs, a person proactively works to meet the needs for survival, safety, and security (Young & Young 2016).

The next survival-safety theory is a theory that refers to joint or team/group survival safety, as presented by Tuckman. A circumstance that makes it possible to join a group or a group mission. Changing policies, priorities, or personnel as needed to get the group back in order. Three important functions must be considered for group work including (1) supervising and reviewing the safety program and its processes (by the survival-safety steering group), (2) observing work practices, providing feedback and coaching (by the observation group and feedback), (3) people hold the responsibility for safely replacing risky behavior (by a well-accountable group/responsibility group).

Group development is considerably more likely to involve reform, restructuring, or transformation when applied to security. Even though researchers, academics, businesses, and other organizations have used different terminology to refer to the four stages of group cooperation growth, there is no dispute that these four stages pertain to a certain form of leadership. Forming, storming, norming, and performing are the most prominent names for this developmental period (Vaida & Șerban, 2021).

In the forming stage, the unit is newly constituted and has been assigned duties. Group members prefer to operate alone and do not yet know or trust one another. Much time is spent planning, gathering information, and getting along. In the storming stage, the group has begun to explore ideas connected to the work they must complete. Group members are receptive to one another, exchange their thoughts and viewpoints, and construct the group's vision and goal (Vaida & Șerban, 2021).

At the norming stage, there is already an agreement between group members. The group began to mutually determine which way out they chose to complete their guidance and counseling tasks. They agree on who should lead and who should work to complete the task. In the performing stage, the group can complete work and tasks smoothly and effectively. Members work together, and they respect each other and communicate. Guidance and counseling participant groups have determined the rules and member functions and started tasks following what has been agreed upon (Vaida & Șerban, 2021).

The capacity for survival and the experience of safety are interpreted through diverse conceptual frameworks and perspectives. This capacity may be attained through self-integration of the surrounding environment, the fulfillment of fundamental human needs, or adherence to structured stages of occupational or developmental processes.

1.1. Purpose of study

This study aims to address this gap by developing a valid and reliable Survival-Safety Skills Scale (4S), specifically tailored for adolescents in school settings. Based on the purpose of this study, to develop and evaluate the psychometric properties of The Survival-Safety Skills Scale (4S) and the background literature above, the research questions are:

1. How validated is the Survival-Safety Skills Scale (4S) based on Rasch Model analysis?
2. How reliable is the Survival-Safety Skills Scale (4S) based on Rasch Model analysis?

2. METHODS AND MATERIALS

2.1. Participants

The participant selection technique uses a convenience sampling technique. This research covers responses from 362 Indonesian students enrolled in senior high school. Table 1 summarizes the demographics of the respondents to this study.

Table 1

Profile of the participants

No	School	Gender		frequency
		Male	Female	
1	Senior High School 2 Yogyakarta	47	70	117
2	Muhammadiyah 2 Senior High School Yogyakarta	59	68	127
3	Senior High School Bopkri 1 Yogyakarta	68	50	118
	Total	**174**	**188**	**362**

2.2. Data collection tool

The instrument developed and tested in this study was the Survival-Safety Skills Scale (4S) using a quantitative approach. The research procedure for developing the Survival-Safety Skills Scale (4S) was carried out in 4 stages: the development of concepts and items, expert validity, readability test, and empirical test. First, the development of concepts and items. Survival-safety skills are the abilities possessed by individuals to survive various threats by modifying the interaction between people, behavior, and the environment so that the individual is free from physical, psychological, and personal-social injuries. The developed instrument consists of 43 items with details of 37 favorable items and 6 unfavorable items (Table 2).

Table 2

Alternative answer scores on the survival-safety skills (SSS) scale

Alternative Answers	score	
	Favorable	Unfavorable
Agree	3	1
Neither agreed	2	2
Disagree	1	3

Second, expert validity. The judgment of experts in the field of guidance and counseling carries expert validity. Experts weigh instruments with observing, assessing, and evaluating techniques. Experts review content, construction, and language with notes as material for instrument revision. Experts agree that, although there are minor notes, the survival safety skills (SSS) instrument, which has been studied in terms of constructs, content, and editorial points, is feasible.

The third is a test of readability. After the instrument was changed according to the expert's comments, a readability test for high school students was conducted. The readability test was carried out by asking the willingness of several teenagers to fill out the survival-safety skills instrument and analyzing whether the language used in each statement item could be understood. The readability test results are then used as material for the improvement of the statement items. Fourth, empirical trials were conducted on 365 participants. Three of the 365 answer sheets collected were not filled out, so the answer sheets used were 362. Finally, the calibration and standardization of the SSS instrument were carried out through the analysis of the Rasch Model.

2.3. Data analysis

The empirical trial data were evaluated using the Rasch Model's calibration and normalization functions. In addition, the study was undertaken to assess the validity and reliability of the scale. Rasch model operation using the Winstep application version 3.73. The benefits of the model include: providing a linear scale with equal intervals, being able to forecast missing data, being able to provide exact predictions, being able to discover the scale's weaknesses, and supplying a scale that can be replicated (Taufiq et al., 2021).

3. RESULT

The research results are presented in tables, graphs, and images, so readers can understand easily. The research results on the development of Survival-Safety Skills (SSS) were analyzed using the Rasch Model, including Unidimensionality, Wright Map Analysis (Person-Item Map), Item Analysis, Rating Scale Diagnostic, Reliability, and Test Information Functioning. The discussion is presented after the result is presented.

3.1. Unidimensionality

Item analysis should be carried out on data that has met the assumption of unidimensionality (DeVellis & Thorpe, 2021) and local independence (Sumintono & Widhiarso, 2013). Unidimensionality analysis identifies several dimensions or attributes that are measured by the instrument. The unidimensionality analysis examines the value of raw variance explained by measures and unexplained variance. The outcomes of the 4S unidimensionality test items are displayed in the table 3 below.

Table 3

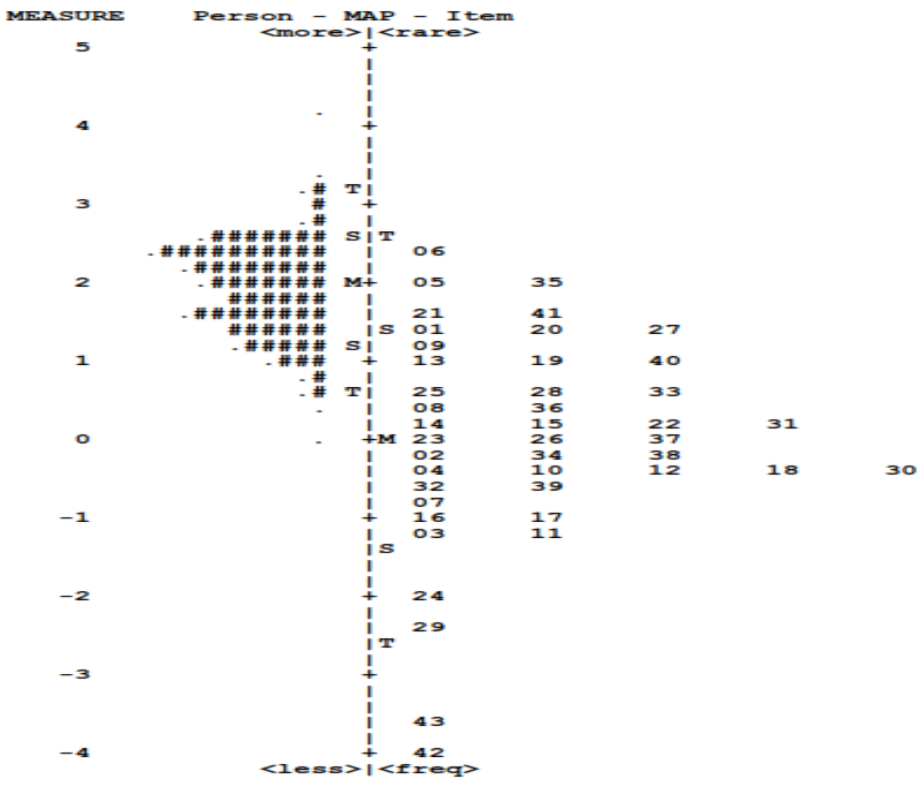
Unidimensionality item test results 4S

		empirical		modeled
Total raw variance in observations	62.9556	100.0%		**100.0%**
Raw variance explained by measures	19.9555	**31.7%**		**33.3%**
Raw variance explained by persons	6.7111	10.7%		**11.2%**
Raw Variance explained by items	13.2444	21.0%		**22.1%**
Raw unexplained variance (total)	430000	68.3%	100.0%	**66.7%**
Unexplained variance in 1st contrast	2.8908	**4.6%**	6.7%	
Unexplained variance in the 2nd contrast	2.2378	**3.6%**	5.2%	
Unexplained variance in the 3rd contrast	1.7317	**2.8%**	4.0%	
Unexplained variance in 4th contrast	1.7091	**2.7%**	4.0%	
Unexplained variance in the 5th contrast	1.5992	**2.5%**	3.7%	

Table 3 indicates that the raw variance explained by the measures, totaling 31.7%, falls within the sufficient category. This result demonstrates that the unidimensionality requirement is satisfied, as unidimensionality of measurements is supported when the raw variance explained by the measure exceeds 20% (Sumintono & Widhiarso, 2013). The unexplained variance is recorded as 4.6%, 3.6%, 2.8%, 2.7%, and 2.6% for the first through fifth contrasts of residuals, respectively. Each value remains below the 15% threshold. According to Fisher and To (2012), unexplained variance within the first to fifth contrasts of residuals below 15% supports interpretation criteria where values above 15% are considered poor, between 10% and 15% are considered fair, between 5% and 10% are considered good, around 3.5% are considered very good, and values below 3% are categorized as excellent. Based on these findings, the construct measured by the instrument is interpreted as representing a single unidimensional variable, namely survival safety skills (SSS).

Figure 1

Person-ıtem map



3.2. Wright map analysis

Referring to the variable map, it is known that the person's ability map spreads from -0.09 to +4.20 logit. Meanwhile, some items have outlier capacities that are low and high extremes. The average logit strength of the person is +1.91, and the standard deviation of 0.64 is above the average logit item, which is 0.00. It indicates that the average person's capacity is above the average item standard difficulty level. Meanwhile, the item difficulty map spreads from -4.00 to +2.35 logit. The difficulty level is 41, which is from -2SD to +2SD, while two items, namely numbers 42 and 43, are below -2SD. Therefore, item numbers 42 and 43 have item difficulty levels, including outliers. The average difficulty level of standard items is below the ability level. Thus, the statement items on the survival-safety skills scale (4S) were relatively easy to agree with by the participants. The Person-Item Map is presented in Figure 1.

3.3. Item analysis

The analysis of items reveals how the difficulty level of the items and the items fit the participants. The test results on these two things are described below.

3.3.1. Item difficulty level

The result of the item difficulty level is revealed through the item measure output is 1.33 SD value. The difficulty level of items is grouped into four categories based on (Boone et al., 2014), namely very difficult, difficult, easy and very easy category. Then, the criteria are combined with the average results of SD which produce the item difficulty level as follows (table 4). Very difficult category (greater than 1.33), difficult category (0.00 -1.33), easy category (-1.33 to less than 0.00) and very easy category (less than -1.33).

Table 4

Item difficulty test results 4S

Entry number	Total score	Total Count	measures	MODEL SE	Infit		Outfits		Pt measure		Exactobs%	matchexp%	Items
					Mnsq	Zstd	Mnsq	Zstd	Corr.	Exp			
6	648	362	2.35	.08	.83	-3.21	.87	-2.13	.42	.40	56.6	46.7	06
35	705	362	2.02	.08	.75	-4.93	.79	-3.99	.31	.41	60.2	44.6	35
5	719	362	1.94	.08	1.41	6.69	1.40	6.19	.52	.41	16.3	44.7	05
21	786	362	1.56	.08	.89	-1.96	.87	-2.28	.52	.40	48.3	45.8	21
41	792	362	1.52	.08	.50	-9.90	.56	-8.74	.11	.40	71.0	46.4	41
20	804	362	1.45	.08	1.19	3.11	1.14	2.20	.47	.40	34.5	46.4	20
1	816	362	1.38	.08	.67	-6.25	.75	-4.34	.00	.40	60.8	47.9	01
27	827	362	1.32	.08	.51	-9.90	.55	-8.28	.25	.40	71.5	47.8	27
9	842	362	1.22	.08	.62	-7.28	.66	-5.68	.17	.39	61.0	49.9	09
19	879	362	.98	.08	1.29	4.07	1.30	3.65	.23	.38	49.4	55.0	19
13	887	362	.92	.08	98	-.28	.95	-.62	.34	.38	51.4	55.3	13
40	889	362	.91	.08	1.39	5.09	1.29	3.45	.37	.37	49.2	55.3	40
28	920	362	.68	.09	1.25	3.14	1.12	1.32	.43	.36	58.8	60.3	28
33	923	362	.65	.09	.82	-2.58	.76	-2.90	.50	.36	70.7	60.5	33
25	935	362	.56	.09	.88	-1.56	.85	-1.63	.37	.35	60.8	63.5	25
36	946	362	.46	.09	1.00	.00	1.12	1.21	.04	.34	52.8	65.3	36
8	957	362	.36	0.10	1.05	.57	1.13	1.29	.33	.33	69.1	67.7	08
14	969	362	.24	0.10	1.76	6.93	1.62	4.85	.32	.32	74.0	70.5	14
22	969	362	.24	0.10	.87	-1.44	.87	-1.21	.34	.32	68.2	70.5	22
31	974	362	.19	0.10	.97	-.28	1.04	.42	.21	.31	69.3	72.0	31
15	977	362	.16	0.10	1.00	.01	.86	-1.30	.45	.31	76.8	72.4	15
37	979	362	.07	0.11	1.10	1.01	1.04	.38	.35	.30	75.3	74.7	37
26	991	362	-.01	0.11	.99	-.08	1.19	1.53	.08	.30	73.5	76.4	26
23	998	362	-.09	0.11	1.32	2.82	1.29	2.12	.29	.29	80.4	77.9	23
34	999	362	-.11	0.11	1.46	3.83	1.18	1.38	.37	.29	82.3	78.1	34
2	1006	362	-.20	0.12	.92	-.71	.81	-1.43	.35	.28	80.7	79.6	02
38	1009	362	-.24	0.12	1.22	1.82	.99	-.02	.36	.27	84.0	80.5	38
4	1014	362	-.32	0.12	1.06	.53	.83	-1.19	.43	.27	83.7	81.6	04
10	1019	362	-.40	0.13	.91	-.73	.86	-.97	.35	.26	84.3	82.8	10

18	1020	362	-.42	0.13	1.30	2.26	1.08	.56	.41	.26	88.4	83.1	18
30	1020	362	-.42	0.13	1.10	.81	.79	-1.44	.44	.26	86.2	83.1	30
12	1024	362	-.48	0.13	1.32	2.31	1.17	1.10	.23	.25	85.6	84.2	12
39	1032	362	-.63	0.14	1.23	1.60	1.16	.99	.19	.24	86.7	86.0	39
32	1033	362	-.65	0.14	1.21	1.48	1.16	.96	.22	.23	87.3	86.3	32
7	1039	362	-.78	0.15	1.50	3.01	1.14	.81	.33	.22	92.0	87.8	07
16	1045	362	-. 93	0.16	.99	-.03	.65	-2.03	.33	.21	89.8	89.2	16
17	1050	362	-1.07	0.17	1.34	1.86	1.24	1.14	.23	.20	91.7	90.5	17
3	1054	362	-1.19	0.18	1.60	2.89	1.10	.52	.28	.19	94.5	91.6	03
11	1056	362	-1.26	0.19	1.41	2.04	1.30	1.31	.23	.18	93.9	92.1	11
24	1070	362	-1.90	0.25	1.72	2.42	1.58	1.71	.13	.14	97.2	95.7	24
29	1077	362	-2.49	0.34	1.41	1.18	1.32	.85	.14	.10	98.1	97.6	29
43	1083	362	-3.59	0.58	1.00	.19	.95	.15	.06	.06	99.2	99.2	43
42	1084	362	-4.00	0.71	.99	.23	.64	-.32	.09	.05	99.4	99.5	42
MEAN	950.4	362.0	.00	0.14	1.11	.3	1.02	-.2			73.6	71.8	
P.SD	108.5	.3	1.33	0.12	.30	3.6	.25	2.9			18.3	17.2	

The complexity of the items ranges from very difficult to very simple based on these criteria. There were discovered to be 7 items in the very difficult category. They are items 06, 35, 05, 21, 41, 20, and 01; the difficult category has 15 items, they are items 7, 09, 19, 13, 40, 28, 33, 25, 36, 08, 14, 22, 31, 15, and 37; the easy category has 17 items, they are items 26, 23, 24, 02, 38, 04, 10, 18, 30, 12, 39, 32, 07, 16, 17, 03, and 11; and four items for very easy category which are items 24, 29, 43.

3.3.2. Item suitability level

The degree of item appropriateness seeks to determine the item's compatibility with the model that describes whether the item normally performs in measuring, and any preconceived notion of the item. The criteria for checking item fit and item mismatch are: The MNSQ OUTFIT > 0.5 and < 1.5, the closer to number is 1 the better, The OUTFITZSTD > -2.0 and < +2.0, the closer to 0 is better, PT MEASURE CORR > 0.40 and < 0.85[29]. Another way of assessing item suitability is to add up the mean of the INFIT MNSQ with the standard deviation (INFIT MNSQ SD). Items that have an INFIT MNSQ value greater than the sum of the mean INFIT MNSQ values (mean INFIT MNSQ) with their standard deviation (INFIT MNSQ SD) are therefore declared unsuitable (Sumintono & Widhiarso, 2013).

According to the data in the item fit order, the INFIT mean square (MNSQ) column shows that the average is 1.11 and the SD is 0.30, so that the value is 1.11+0.30+1.41; so, the MNSQ infit value is greater than 1.41. This indicates that the item is not consistent. Based on the criteria (Boone et al., 2014) using the MNSQ OUTFIT value, it is known that there are 2 misfit items, namely numbers 14 and 24, each of which has an MNSQ OUTFIT value of 1.62 and 1.58. As for referring to the criteria (Sumintono & Widhiarso, 2013). There are 5 items that have an INFIT MNSQ value greater than 1.41, namely numbers 14, 24, 03.07, and 34. Thus, 28 survival-safety skills (SSS) items are declared fit, meaning the items usually function and can be correctly understood by participants and can also measure what should be measured, in this case, survival safety skills (SSS).

3.4. Diagnostic rating scales

The diagnostic of the rating scale determines if the participant comprehends the difference between response options on a scale of 1, 2, and 3. If the observed values and the Andrich threshold in the output demonstrate conformity and both rise in the alternative replies 1,2,3, the responder may comprehend the difference in answers. The output table displays the similarity between the increase in the observed average and Andrich threshold values and the response selections on a scale of 1.2.3. Because the analysis results show a match between the increase in the value of these two things and the increase in the rating scale, it may be concluded that participants comprehend the differences between response choices 1, 2, and 3. Therefore, alternative answers 1, 2, and 3 can be used in the survival-safety skills (SSS) instrument. An overview of the Diagnostic Rating Scale is presented in Table 5.

Table 5

Summary of category structure Model 4S

CATEGORY	OBSERVED	OBSVD	SAMPLE	INFIT	OUTFITS	ANDRICH	CATEGORY

LABEL	SCORE	COUNT	%	AVRGE	EXPECT	MNSQ	MNSQ	THRESHOLD	MEASURE	
1	1	1172	8	**.37**	.16	1.16	1.59	NONE	(-1.81)	0
2	2	3482	22	**.92**	1.06	.87	.71	-.50	.00	1
3	3	10910	70	**2.39**	2.37	.99	1.01	.50	(1.81)	3

3.5. Reliability

The reliability results were analyzed based on the person and item Survival-Safety Skills Scale (4S). Person reliability analysis is presented in Table 5, and item reliability is presented in Table 6 below.

Table 6

Person reliability test results 4S

	TOTAL SCORE	COUNT	MEASURE	MODEL SE	INFIT		OUTFITS	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	112.9	43.0	1.91	.31	.98	.00	1.02	.14
SEM	.4	.0	.03	.00	.02	.07	.04	.05
P.SD	7.3	.1	.64	.06	.33	1.27	.78	1.00
S.SD	7.3	.1	.64	.06	.33	1.28	.78	1.00
MAX.	127.0	43.0	4.20	.72	2.57	5.94	7.42	5.29
min.	83.0	42.0	-.09	.24	.50	-2.57	.30	-1.42
REAL	RMSE .33	TRUE SD	.55	SEPARATIONS 1.64		Person RELIABILITY .73		
MODEL	RMSE.32	TRUE SD	.56	SEPARATIONS 1.75		Person RELIABILITY .75		
SE of Person MEAN=.03								

Table 6

Item reliability test results 4S

	TOTAL SCORE	COUNT	MEASURE	MODEL SE	INFIT		OUTFITS	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	950.4	362.0	.00	.14	1.11	.25	1.02	-.24
SEM	16.7	.0	.20	.02	.05	.56	.04	.45
P.SD	108.5	.3	1.33	.12	.30	3.63	.25	2.90
S.SD	109.8	.3	1.34	.12	.30	3.67	.26	2.93
MAX.	1084.0	362.0	2.35	.71	1.76	6.93	1.62	6.19
min.	648.0	360.0	-4.00	.08	.50	-9.90	.55	-8.74
REAL	RSE .20	TRUE SD	1.31	SEPARATIONS 6.56		RELIABILITY items .98		
MODEL	RMSE .19	TRUE SD	1.31	SEPARATIONS 6.99		RELIABILITY items .98		
SE of Person MEAN=.20								

Person and Item Reliability. The table shows that the personal reliability value is 0.73. based on the criteria, it is in a good category (Boone et al., 2014). However, the item's reliability is 0.98 and belongs to the special category (Boone et al., 2014). The results indicate that item reliability is better than person reliability in the category. The Cronbach Alpha describing the person and the items interaction is 0.78, which includes the good category. Person Measure. The Mean Person measure 1.91 logit is the average score of all participants on the survival-safety skills (SSS) data-revealing instrument items. The average person value is larger than the average item value (where the average item value is 0.00 logit), showing that the participant's ability reaches the instrument item's difficulty.

Person and Item Quality. The average values of INFIT MNSQ and OUTFIT MNSQ for people are 0.98 and 1.02. Meanwhile, the average values for items are 1.11 and 1.02. The typical person and item closely meet the ideal characteristics, and 1 is the optimal value. Therefore, the closer to 1 is the better criterion. In addition, the mean values for INFIT ZSTD and OUTFIT ZSTD for the person are 0.00 and 0.14. Items have INFIT and OUTFIT ZSTD values of 0.25 and 0.24. The optimal ZSTD value is 0; the closer to 0, the better. Thus, it can be concluded that the quality of people and items is good.

Person and Item Separation. The reliability value in Rasch modeling is indicated by the separation or grouping of individuals (person separation) and the grouping of items (item separation) (Hamdan et al., 2022). Individual separation shows how well the item set is on the survival-safety skills (SSS) instrument. Spread throughout the logit strength range. The larger the value of individual separation, the better the preparedness of the instruments, which may reach persons with high-level to low-level competencies. The item separation indicates how widely the measured sample is distributed over a linear interval scale. The greater the grain separation, the more accurate the measurements. The index is also useful for characterizing the significance of the measured component.

Tables 4 and 5 show that the separation between a person and an item is 1.64 and 6.56. The larger the separation value, the higher the overall quality of the instrument. The separation value is determined with more precision using the formula: H {(4 x separation) + 1}/3. Based on the formula, the person's separation value is 2.52, rounded to 3, while the item's separation value is 9.08, rounded to 9. This indicates that study participants' talents may be classified into three groups. Moreover, the complexity of the items is divided into nine groups, ranging from the easy group to the most difficult group. The summary of test reliability is presented in the following Table 8.

Table 8

Summary of Reliability Test Results 4S

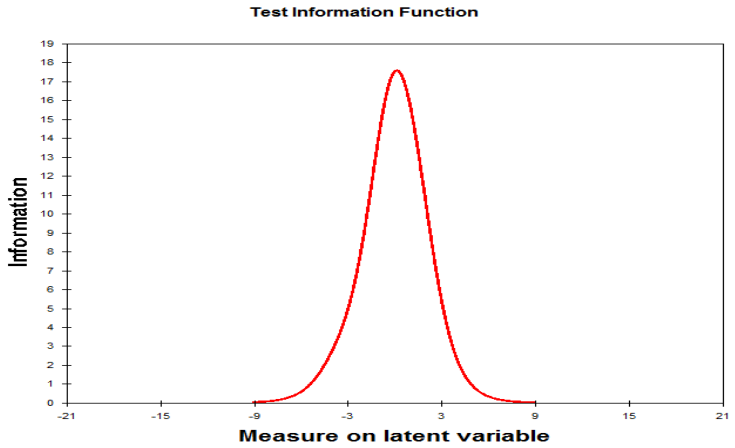
	Means	SD	Separation	reliability	Cronbach Alpha
Person	1.91	0.64	1.64	0.73	0.78
Items	0.00	1.33	6.56	0.98	

3.6. Test information functioning

The measurement information feature displays the accuracy of the measurements that have been taken. The higher the peak of the information function, the greater the measurement reliability (Boone et al., 2014). Regarding the measurement results/focus data, a picture as depicted in Figure 2 is acquired. The chart illustrates that survival-safety skills (SSS) items are likely to yield high information for persons with moderate ability.

Figure 2

Test information functioning



4. DISCUSSION

The table shows that the raw variance explained by measures of 31.7% is in the good category. Based on these results, it can be stated that 4S only measures one variable, namely survival-safety skills (SSS), and does not measure other variables. When compared with previous findings, namely the Street Survival Skills Questionnaire, the use of the questionnaire in the assessment of adaptive behavior was supported but within

a narrow scope (Janniro et al., 1994). This scale focuses on conditions on the road, while the 4S focuses on conditions at school. If analyzed from theoretical studies, this scale is in line with the concept of safety (Zin & Ismail, 2012), even though there are several aspects in it; all aspects have been measured to become one unified whole. Like Zin & Ismail (2012) state that security is a combination of personal and environmental factors.

Item numbers 42 and 43 have item difficulty levels, including outliers. The average difficulty level of standard items is below the ability level. Thus, the statement items on the survival-safety skills scale (4S) were relatively easy to agree with by the participants. Of all the items tested, only two items were considered the most difficult by the respondents, meaning that the other items were appropriate. The level of difficulty of this item can be analyzed by the suitability of the respondents' criteria with the developed scale. This instrument is suitable for high school students. This finding is also an extension of the findings on the safety skill scale Penetliti previously used the Personal Safety Skills instrument at the elementary school level. (Juarni et al., 2020).

Different periods in life call for completing specific tasks. Tasks closely related to changes in maturity, schooling, work, religion, and others are a prerequisite for life's fulfillment and happiness. To complete developmental tasks, survival-safety skills in adolescents are an effort to prevent adolescents from mall adjustment risky behavior in the future.

In addition, adults have a positive relationship in helping adolescents feel safe, have a sense of belonging, and be loved (sense of survival-safety, sense of belonging, and love). Teenagers are still directly dependent on adults to meet their needs to gain life skills. By having skills based on survival safety, adolescents can complete developmental tasks and solve life's problems in the future. The developmental stage is a task that comes at a given point in a person's life span and, if performed effectively, will lead to enjoyment and success in completing the subsequent assignment. Nonetheless, if it fails, it will result in the individual's sadness.

Based on the rating scale side, the results of the analysis show that there is a match between the increase in the value of these two things along the rise in the rating scale. It may be concluded that participants comprehend the differences between response choices 1, 2, and 3. Therefore, alternative answers 1, 2, and 3 can be used in the survival-safety skills (SSS) instrument. The rating scale analysis developed (4S) is different from other instruments. Such as the survival and safety skills questionnaire used (Putri, 2020) has a range of 1-4, with answer choices 1) Poor, 2) Fair, 3) Good, and 4) Very Good. There are other differences with person safety used statements with five Likert model choices of answer: Absolutely Agree (AA), Agree (A), Neutral (N), Not Agree (NA), and Absolutely Not Agree (ANA). The scores were moved from 1 to 5 (Juarni et al., 2020). Even though the various scales used are vulnerable, the accuracy of the scale developed has been tested to be appropriate and precise.

5. CONCLUSION

This study shows that the 36 items from the survival-safety skills (4S) scale are valid and reliable. Outlier items (numbers 42 and 43) and inappropriate items (numbers 03, 07, 14, 24, 34) were declared unsuitable items, so they are not used in data collection. The Cronbach Alpha value is in a good category, the person reliability is in a good category, and the item reliability is in a special category. The survival-safety skills scale (4S) items are more dominant in realizing high information in individuals with moderate abilities.

Future research recommends testing the survival safety skills scale (4S) instrument more broadly. First, this study is limited to revealing survival safety skills in high school participants, therefore the sample for future research has a more varied school level, such as junior high school. Second, testing with demographics of different regions, this research is limited to testing in one area, Yogyakarta. Third, adding test analysis based on gender strengthens the feasible instrument without gender bias.

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Ethical Approval: The study adheres to the ethical guidelines for conducting research.

REFERENCES

Abulof, U. (2017). Introduction: Why we need Maslow in the twenty-first century. *Society*, *54*(6), 508-509. https://link.springer.com/article/10.1007/s12115-017-0198-6

Adotey, P. B., Segbefia, E., Sampene, A. K., & O'Brien, C. (2025). Occupational Health and Safety Practices to Enhance Safety Behavior in Ghana's Mining Sector: The Moderating Effect of Transformational Leadership. *Journal of the Knowledge Economy*, 1-32. https://link.springer.com/article/10.1007/s13132-025-02636-6

Baruni, R. R., & Miltenberger, R. G. (2024). A Survey of Safety Skills Training Used by Behavior Analysts in Practice. *Behavior Analysis in Practice*, *17*(1), 270-282. https://link.springer.com/article/10.1007/s40617-023-00835-8

Boone, W. J., Staver, J. R., & Yale, M. S. (2014). *Rasch analysis in the human sciences* (Vol. 10, pp. 978-94). Dordrecht: Springer. https://link.springer.com/content/pdf/10.1007/978-94-007-6857-4.pdf

Chen, H. Y., Chen, L. J., & Hsueh, Y. F. (2015). Explore the Key Incidents of Adolescents Deviant Behavior based on the Perspective of Social Control. *International Journal of Crisis Management*, *5*(1), 1-7. https://www.airitilibrary.com/Article/Detail/P20191206001-201501-201912060024-201912060024-1-7

Clark, A. E., & Lohéac, Y. (2007). "It wasn't me, it was them!" Social influence in risky behavior by adolescents. *Journal of health economics*, *26*(4), 763-784. https://www.sciencedirect.com/science/article/pii/S0167629606001299

Côté, J. E. (2013). *Adolescent storm and stress: An evaluation of the Mead-Freeman controversy*. Routledge. https://www.taylorfrancis.com/books/mono/10.4324/9780203773642/adolescent-storm-stress-james-t%E2%80%9A-james-cote

Crandall, A., Powell, E. A., Bradford, G. C., Magnusson, B. M., Hanson, C. L., Barnes, M. D., ... & Bean, R. A. (2020). Maslow's hierarchy of needs as a framework for understanding adolescent depressive symptoms over time. *Journal of Child and Family Studies*, *29*, 273-281. https://link.springer.com/article/10.1007/s10826-019-01577-4

Cui, L., Fan, D., Fu, G., & Zhu, C. J. (2013). An integrative model of organizational safety behavior. *Journal of safety research*, *45*, 37-46. https://www.sciencedirect.com/science/article/pii/S0022437513000029

Denkowski, G. C., & Denkowski, K. M. (2008). Misuse of the Street Survival Skills Questionnaire (SSSQ) for evaluating the adult adaptive behavior of criminal defendants with intellectual disability claims. *Intellectual and developmental disabilities*, *46*(2), 144-149. https://meridian.allenpress.com/idd/article-abstract/46/2/144/219

Desautels, L. (2014). Addressing our needs: Maslow comes to life for educators and students. https://digitalcommons.butler.edu/coe_papers/115/

DeVellis, R. F., & Thorpe, C. T. (2021). *Scale development: Theory and applications*. Sage publications.

Elfering, A., Ruppen, V., & Grebner, S. (2013). Learning to drive: Learners' self-reported cognitive failure level predicts driving instructor's observation rating of driving performance. *International journal of occupational safety and ergonomics*, *19*(3), 485-491. https://www.tandfonline.com/doi/abs/10.1080/10803548.2013.11077004

Fialho, M., Nunes, S., & Gamelas, C. A. (2024). Risk Perception, Safety Behavior and Work Accidents: Assessment and Relations in a Sample of Portuguese Firefighters. *Fire Technology*, *60*(5), 3529-3552. https://link.springer.com/article/10.1007/s10694-024-01585-x

Fisher, C. D., & To, M. L. (2012). Using experience sampling methodology in organizational behavior. *Journal of Organizational behavior*, *33*(7), 865-877. https://onlinelibrary.wiley.com/doi/abs/10.1002/job.1803

Gysbers, N. C., & Henderson, P. (2014). *Developing and managing your school guidance and counseling program*. John Wiley & Sons.

Hall, C. S., Lindzey, G., & Campbell, J. B. (1998). *Theories of personality*. John Wiley & Sons Inc. https://psycnet.apa.org/record/1998-06741-000

Hamdan, A. H., Supriatna, M., & Yhuda, E. S. (2022). Developing the Adolescent Career Success Instrument (ACSI): A Rasch Model analysis. *International Journal of Research in Counseling and Education*, *6*(1).

Hatch, T., Poynton, T. A., & Pérusse, R. (2015). Comparison findings of school counselor beliefs about ASCA national model school counseling program components using the SCPCS. *Sage Open*, *5*(2), 2158244015579071. https://journals.sagepub.com/doi/abs/10.1177/2158244015579071

Hawkins, R. E., Welcher, C. M., Holmboe, E. S., Kirk, L. M., Norcini, J. J., Simons, K. B., & Skochelak, S. E. (2015). Implementation of competency-based medical education: are we addressing the concerns and challenges?. *Medical education*, *49*(11), 1086-1102. https://asmepublications.onlinelibrary.wiley.com/doi/abs/10.1111/medu.12831

Janniro, F., Sapp, G. L., & Kohler, M. P. (1994). Validating the Street Survival Skills Questionnaire. *Psychological reports*, *74*(1), 191-194. https://journals.sagepub.com/doi/abs/10.2466/pr0.1994.74.1.191

Juarni, S. E., Mukhtar, D. Y., & Daulay, D. A. (2020). Knowledge and personal safety skill of children in Banda Aceh. *International Research Journal of Advanced Engineering and Science*, *5*(1), 60-62. http://irjaes.com/wp-content/uploads/2020/10/IRJAES-V4N4P358Y19.pdf

Lapan, R. T. (2012). Comprehensive school counseling programs: In some schools for some students but not in all schools for all students. *Professional School Counseling*, *16*(2), 2156759X1201600201. https://journals.sagepub.com/doi/abs/10.1177/2156759X1201600201

Martin, D. J., & Loomis, K. S. (2013). *Building teachers: A constructivist approach to introducing education*. Wadsworth Publishing. https://digitalcommons.kennesaw.edu/facbooks2013/12/

Neherta, M. (2017). Modul Intervensi pencegahan kekerasan seksual terhadap anak. *Padang: Universitas Andalas*.

Putri, V. D. (2020). Layanan Dasar Bimbingan Dan Konseling untuk Peningkatan Survival And Safety Skills Siswa. *Coution: Journal Counseling and Education*, *1*(1), 21-33. https://jurnal.uibbc.ac.id/index.php/coution/article/view/80

Setyono, B., & Widodo, H. P. (2019). The representation of multicultural values in the Indonesian Ministry of Education and Culture-Endorsed EFL textbook: a critical discourse analysis. *Intercultural Education*, *30*(4), 383-397. https://www.tandfonline.com/doi/abs/10.1080/14675986.2019.1548102

Sinković, M., Štulhofer, A., & Božić, J. (2013). Revisiting the association between pornography use and risky sexual behaviors: The role of early exposure to pornography and sexual sensation seeking. *Journal of sex research*, *50*(7), 633-641. https://www.tandfonline.com/doi/abs/10.1080/00224499.2012.681403

Stoyanov, S. (2017). A theory of human motivation. In *A Theory of Human Motivation*. Macat Library. https://doi.org/10.4324/9781912282517

Sumintono, B., & Widhiarso, W. (2013). *Aplikasi model rasch: Untuk penelitian ilmu-ilmu sosial*. Trim Komunikata Publishing House.

Taufiq, A., Yudha, E. S., Md, Y. H., & Suryana, D. (2021). Examining the Supervision Work Alliance Scale: A Rasch Model Approach. *The Open Psychology Journal*, *14*(1). https://openpsychologyjournal.com/VOLUME/14/PAGE/179/FULLTEXT/

Trevisan, M. S., & Carey, J. C. (2020). *Program evaluation in school counseling: Improving comprehensive and developmental programs*. Routledge. https://www.taylorfrancis.com/books/mono/10.4324/9780429437229/program-evaluation-school-counseling-michael-trevisan-john-carey

Vaida, S., & Șerban, D. (2021). Group development stages. A brief comparative analysis of various models. *Studia Universitatis Babeș-Bolyai Psychologia-Paedagogia*, *66*(1), 91-110. https://www.researchgate.net/profile/Sebastian-Vaida/publication/352815932_Group_Development_Stages_A_Brief_Comparative_Analysis_of_Various_Models/links/60dacf91458515d6fbe7adf8/Group-Development-Stages-A-Brief-Comparative-Analysis-of-Various-Models.pdf

Wang, X., Zhang, Y., & Li, J. (2023). Childhood trauma and internalizing and externalizing behavior problems among adolescents: Role of executive function and life events stress. *Journal of Child and Adolescent Behavior*. https://doi.org/10.1016/j.jcab.2023.100123

Winston, C. N. (2016). An existential-humanistic-positive theory of human motivation. *The Humanistic Psychologist*, *44*(2), 142. https://psycnet.apa.org/record/2016-28070-003

Young, G., & Young, G. (2016). Revising Maslow. *Unifying Causality and Psychology: Being, Brain, and Behavior*, 833-855. https://link.springer.com/chapter/10.1007/978-3-319-24094-7_34

Yusuf, S., & Nurihsan, J. (2013). *Teori Kepribadian*. PT Remaja Rosdakarya.

Zhang, J., Zhang, F., Liu, S., & Zhou, Q. (2024). Enhancing work safety behavior through supply chain safety management in small and medium sized manufacturing suppliers. *Scientific Reports*, *14*(1), 22667. https://www.nature.com/articles/s41598-024-73098-0

Zhang, W., & Zhu, L. (2021). The influence of peers on adolescents' risk-taking behavior and its mechanism. *Advances in Psychological Science, 29*(8), 1462–1471. https://doi.org/10.3724/SP.J.1042.2021.01462

Zin, S. M., & Ismail, F. (2012). Employers' behavioural safety compliance factors toward occupational, safety and health improvement in the construction industry. *Procedia-Social and Behavioral Sciences*, *36*, 742-751. https://www.sciencedirect.com/science/article/pii/S1877042812005484