



The Sullivan emotional intelligence scale for children: Assessing the validity and reliability of the scale in the Malaysian context

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ABSTRACT

Emotional intelligence plays a critical role in the development of children and has gained significant interest in academic research. This study aimed to evaluate the accuracy of the Malay translation of the Sullivan Emotional Intelligence Scale for Children (EISC). The research involved a convenient group of 50 preschoolers, ages five to six, from the Kuala Nerus district in Terengganu for an initial investigation. To assess the reliability of the EISC, researchers used the Rasch model for analysis. Findings from the Rasch model indicated that out of the original 59 questions, only 38 were appropriate and effective for evaluating the emotional intelligence of children. Furthermore, the analysis revealed a high reliability for both the items and the individuals, with scores of 0.96 and 0.92, respectively. This research offers new insights into the effectiveness of the Malay version of the Sullivan EISC as a tool for assessing emotional intelligence among preschool children in Eastern cultures.

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1. Introduction

Several tools have been developed to measure emotional intelligence (EI), one of which is the Mayer-Salovey-Caruso EI Test (MSCEIT). This test evaluates EI through various tasks aimed at gauging an individual's capability to recognize, use, comprehend, and manage emotions. It operates on the premise that EI encompasses measurable and enhancable skills. The MSCEIT offers an overall EI score and separate scores for each of the four key areas identified in Mayer and Salovey's model of EI (Stoller, 2021). This model views EI as a true form of intelligence that's distinct from personality traits (Mayer et al., 2002). The Multi Factor Emotional Intelligence Scale (MEIS) is an earlier version of the MSCEIT that was developed to assess EI across multiple dimensions. It measures an individual's ability to perceive, facilitate, understand, and manage emotions in themselves and others. The

MEIS involves a variety of tasks and scenarios designed to evaluate these facets of EI, aiming to provide a comprehensive assessment of an individual's emotional capabilities. This scale laid the groundwork for the later development of the MSCEIT, offering a structured approach to understanding emotional intelligence (Mayer et al., 1990) and several other EI measuring tools. However, based on a study conducted by Coşkun et al. (2017), it was found that the current EI measurement tool is not suitable for measuring the level of children's EI.

Researchers have adapted The Sullivan Emotional Intelligence Scale for Children (EISC) (Sullivan, 1999) for Malaysian children. This adaptation involves assessing several aspects of emotional intelligence: recognizing, understanding, controlling, and utilizing emotions. The EISC includes various sub-measures, such as interpreting facial expressions, storytelling, comprehension, and emotion regulation, with specific items dedicated to each area. For instance, identifying emotions through facial expressions involves 20 items, while storytelling involves eight items. Additionally, there are domains focusing on understanding emotions with 12 items, controlling emotions with nine items, and a section on empathy with 10 items.

The EISC instrument was translated from English to Malay language using the back-translation method. The researcher also changed some of the item statements to match the focus tendencies of Malaysian children. Apart from that, every facial expression under the domain of how to identify emotions was also changed and replaced with facial expressions that resemble Malaysians.

In addition to the changes made to the research instruments, the researchers also changed the survey answer scale from three scales to only two scales. For example, 'Yes,' 'No,' and 'I Don't Know' have been changed to 'Yes' and 'No' only. This is because the answer scale for the 'No' and 'I Don't Know' categories record the same identity score. Instructions for the use or application of the instrument will be discussed in the next topic.

2. Instruments instructions

In this initial study, a group of 50 preschool children aged five to six from the Kuala Nerus district in Terengganu was selected through a convenience sampling method. This selection size aligns with [Creswell's \(2014\)](#) recommendation that about 15 participants are needed for each experimental group. Consequently, the researchers divided the 50 children into two groups of 25, grouping them by their preschools to facilitate the study's objectives. This approach ensured a balanced distribution for comparative analysis.

The data collection process is when the researcher reads and asks children questions about each EISC item that has been adapted for Malay preschool children. The preschool children will be shown some stimulus pictures and voiced narration one by one, followed by the question, 'Is this how it feels?' The preschool children will only have to answer either 'yes' or 'no' to each question asked. Researchers should also be involved in helping children answer the distributed questionnaires. This aims to ensure a fair assessment of each child's emotional intelligence ([Ulutaş and Ömeroğlu, 2007](#)). To assess the adapted Sullivan EISC for use with Malaysian preschoolers in Terengganu, both Exploratory Factor Analysis (EFA) and the Rasch Model approach were utilized. These methods examined the validity and reliability of the instrument. Specifically, Rasch analysis was employed because of its unique ability to simultaneously evaluate the difficulty levels of the test items and the capabilities of the test-takers. This dual analysis contributes to a more comprehensive understanding of the tool's effectiveness in the specified context.

A total of 59 items have been adapted using a 'dichotomous' scale that is 'zero' and 'one' during the EISC administration. The 'zero' scale means 'no,' and 'one' means 'yes.' Four domains have been formed under the Sullivan EISC and have been adapted to the context of Malaysian preschool children. The first domain is identifying emotion, which has two parts which are identifying emotions through facial

expressions or pictures (20 items) and storytelling (eight items). The second domain is to understand emotions (12 items). The third domain is controlling emotions (nine items), and the last domain is using emotions (ten items). The researcher used the Exploratory Factor Analysis (EFA) and Rasch Model to test the validity and reliability of the adapted EISC. After the adaptation process and pilot studies were conducted, some items were changed and discarded. After that, the refined instrument is used as the real instrument in this study. The adaptation results will be discussed further in the next section.

3. Validity

In constructing the items, the researcher focused on construct validity as in psychological tests that have been conducted. Testing the level of validity is important to ensure that the items that are constructed are compatible with the respondents to be studied. Therefore, the researcher carried out the exploratory factor analysis (EFA) to identify, reduce, and organize a large number of questionnaire items into specific constructs in the study to determine the validity of this research instrument. [Table 1](#), which is the Rotated Component Matrix which, is a table often used in EFA that displays the loadings of each variable on the extracted factors after rotation. Rotation is a technique used to make the results more interpretable. In this matrix, each row represents a variable, and each column represents a factor. The numbers show how strongly each variable is associated with each factor. A higher absolute value indicates a stronger relationship. This matrix helps in identifying which variables are most related to each factor, aiding in the interpretation of the factors, and shows the questionnaire items in the form of four dimensions (containing four factors). Four factors were extracted from the questionnaire.

The research findings indicate that the questionnaire's items cover multiple concepts rather than a single one, as evidenced by [Table 2](#)'s demonstration of a low correlation among the constructs. This suggests that the four identified factors operate independently from one another, representing distinct constructs.

Upon conducting a thorough examination of the elements encompassed within each factor and juxtaposing them with prior scholarly investigations, it was elucidated that the constituents of the first factor pertain to the utilization of emotions as a mechanism for problem resolution. The elements within the second factor are predominantly concerned with the regulation of emotions, both of the self and of others. The third factor is dedicated to the adeptness in recognizing emotional states in oneself as well as in others, whereas the fourth factor is centered around the comprehension of emotional dynamics. This systematic categorization facilitates a deeper understanding of how each cluster of elements correlates with distinct dimensions of emotional intelligence ([Mayer and Salovey, 1997](#)).

Table 1: Rotated component matrix

	Rotated component matrix ^a			
	Component			
	1	2	3	4
Ability to use emotion 8	.989			.981
Ability to use emotion 9	.975			.946
Ability to use emotion 10	.964			.891
Ability to use emotion 3	.951			
Ability to use emotion 1	.948			
Ability to use emotion 2	.945			
Ability to use emotion 5	.930			
Ability to use emotion 6	.922			
Ability to use emotion 7	.921			
Ability to use emotion 4	.895			
Ability to use emotion 3		.947		
Ability to use emotion 7		.938	.931	
Ability to use emotion 4		.934		
Ability to use emotion 2		.926		
Ability to use emotion 6		.920		
Ability to control emotion 1		.913		
Ability to control emotion 5		.870		
Ability to control emotion 8		.861	.929	
Ability to control emotion 9		.842	.927	
Ability to identify emotion 17			.926	
Ability to identify emotion 16		.799	.925	
Ability to identify emotion 7			.922	
Ability to identify emotion 25			.901	
Ability to identify emotion 24			.899	
Ability to identify emotion 2			.895	
Ability to identify emotion 8			.892	
Ability to identify emotion 4		.657	.886	
Ability to identify emotion 15			.884	
Ability to identify emotion 23			.882	
Ability to identify emotion 22			.879	
Ability to identify emotion 21			.875	
Ability to identify emotion 13			.869	
Ability to identify emotion 12		.654	.866	
Ability to identify emotion 5			.864	
Ability to identify emotion 9		.650	.867	
Ability to identify emotion 10		.647	.853	
Ability to identify emotion 11		.635	.850	
Ability to identify emotion 28		.633	.846	
Ability to identify emotion 27		.631	.847	
Ability to identify emotion 26		.609	.843	
Ability to identify emotion 6			.840	
Ability to identify emotion 3		.599	.825	
Ability to identify emotion 1			.758	
Ability to identify emotion 14		.576	.751	
Ability to identify emotion 18		.564	.746	
Ability to identify emotion 19			.741	
Ability to identify emotion 20		.532	.732	
Ability to understand emotion 2				.842
Ability to understand emotion 5				.803
Ability to understand emotion 6				.727
Ability to understand emotion 1	.463			.697
Ability to understand emotion 4	.345			.659
Ability to understand emotion 3	.341			.655
Ability to understand emotion 7				.572
Ability to understand emotion 8				.569
Ability to understand emotion 9				.541
Ability to understand emotion 10				.532
Ability to understand emotion 11				.498
Ability to understand emotion 12				.495

Extraction method: Principal component analysis; Rotation method: Varimax with Kaiser normalization; a: Rotation converged in 5 iterations

Table 2: Component transformation matrix

Component	Component transformation matrix			
	1	2	3	4
1	.626	.290	.122	.370
2	-.041	.921	-.188	-.338
3	-.776	.170	.554	.248
4	-.064	.195	-.520	.829

Extraction method: Principal component analysis; Rotation method: Varimax with Kaiser normalization

The results of the analysis also found that there are three items under the construct of knowing how to use emotions (items 8, 9, and 10), three items under the construct of knowing how to control emotions (items 7, 8, and 9), 13 items under the construct of know how to identify emotions (item 3, 4, 9, 10, 11, 12, 14, 16, 18, 20, 26, 27, and 28) and four items under the construct of know how to understand emotions' (items 1, 2, 3, and 4) that can be loaded into two factors. After being examined, the items are not suitable and need to be removed due to overlapping concepts. This is because the research conducted is to make a difference between the four constructs, so each item cannot represent two constructs in the comparative analysis between the constructs.

After examining each factor's items and comparing them with previous studies, it was found that the items fall into four distinct categories of emotional intelligence. The first category involves using emotions to solve problems, with seven items. The second category includes five items on controlling emotions. The third, with fifteen items, focuses on identifying emotions. Lastly, the fourth category, understanding emotions, has eight items. This organization helps clarify the different aspects of emotional intelligence. The reliability and deeper analysis of these categories will be discussed further, aiming to enhance understanding of how the instrument measures emotional intelligence.

4. Reliability

Rasch analysis in Table 3 shows moderate item reliability, which is 0.60, which shows that the item is quite enough to measure what should be measured. The moderate quality of the item shows that it is capable of separating individuals with a moderate separation power, which is Person Separation = 1.70. In general, the good level of preschool children's emotional intelligence (EI) in the study area is at the level of $\mu = +2.99$ logit, which is depicted by the person's mean value.

Table 3 reveals the highest item score is +2.55 logit (with a standard error of 1.22), while the highest score for an individual is +4.42 logit (standard error: 1.08), as seen in Table 4. The range of scores for items extends from -1.31 to +2.55 logit, a breadth of 3.86 logits. There exists a gap of 1.87 logits (+2.55 logit to +4.42 logit), indicating a segment of preschool children displaying higher levels of emotional intelligence not covered by the items.

Therefore, the results of the item measurement show that there are less suitable items that are considered very easy for preschool children to answer. As for the results of measuring people, there are preschool children who are unable to answer the items that are considered difficult for them.

Table 3: Measurement of 59 items

	Raw core	Count	Measure	Model error	Infit		Outfit	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	43.0	50.0	.00	.70	.98	.1	1.12	.0
S.D.	4.2	.0	1.43	.28	.34	.9	1.78	1.1
MAX.	50.0	50.0	2.55	1.22	1.60	2.7	9.80	3.6
MIN.	31.0	50.0	-1.67	.37	.48	-2.2	.06	-1.8

Item separation: 1.35; Item reliability: .60

Table 4: Measurements of 50 people

	Raw score	Count	Measure	Model error	Infit		Outfit	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	53.0	59.0	2.99	.65	.99	.1	1.17	.1
S.D.	6.9	.0	1.43	.24	.12	.5	1.81	.9
MAX.	60.0	59.0	4.42	1.08	1.70	2.3	9.80	3.5
MIN.	25.0	59.0	-1.31	.35	.67	-1.2	.17	-9

Person separation: 1.70; Person reliability: .71

5. Distillation results

Reliability of the EISC instrument for children in the context of Malaysian preschoolers conducted using Rasch Model analysis has recorded some items that are not suitable to drop. As a result of distillation, it was found that the number of remaining items was 38 items. As a result of the analysis, a refined instrument was produced that meets good measurement parameters, as shown in Table 5. The skewed values found in Table 5 are the original values of the EISC measurement scale. At

the same time, the value outside the bracket is the best measurement value that has been purified.

Based on Table 5, the instrument that has been purified shows better reliability characteristics than before, which changed from 4.22 logit to 6.68 logit for the range of items. At the same time, the range of people is from 5.73 logit to 10.32 logit. This shows that there is a longer and more encouraging increase in the measuring stick for the item, which is as much as 2.46 logit. This shows that the instrument that has been harmonized has enough ability to measure what it is supposed to measure.

Table 5: Distilled EISC measurement scale in the Malaysian preschool children context

	Item (After distillation)	Item (Before distillation)	Person (After distillation)	Person (Before distillation)
Reliability	0.96	(0.60)	0.92	(0.71)
Infit	0.41	(0.34)	0.38	(0.12)
MNSQ SD				
Mean error	0.53	(0.70)	0.59	(0.65)

5.1. EISC instrument adaptation

Table 5's analysis led to the removal of 21 items deemed unsuitable for assessing Malaysian preschoolers. These include items from various domains, such as identifying emotions through facial expressions and storytelling, understanding emotions, controlling emotions, and using emotions effectively. The specific items removed span across these domains, highlighting a refinement process to ensure the assessment's relevance and appropriateness for the target population. Further details on the discarded items are documented in Tables 6 to 9.

storytelling test. Conversely, Section B is constituted of ten items, Section C encompasses six items, and finally, Section D is comprised of seven items.

6. Findings

7. Conclusion

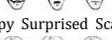
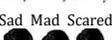
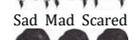
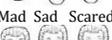
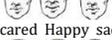
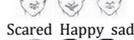
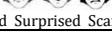
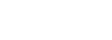
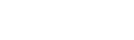
6.1. A refined EISC instrument

Table 10 delineates sections A, B, C, and D, presenting instruments of the Emotional Intelligence Scale for Children (EISC) that have been suitably harmonized for application within Malaysian preschool environments and possess adequate validity for their intended measurements. Section A comprises a total of fifteen items, with ten items dedicated to the assessment of facial expression recognition and five items allocated for the

The investigation revealed that, from a total of 59 items, 21 necessitated exclusion from the original instrument. The rationale behind this exclusion stemmed from certain items being overly simplistic, deemed irrelevant to the respondents (characterized as 'independent of individuals'), or excessively complex for the preschool demographic. Moreover, items that were amenable to classification into multiple categories, thereby implying ambiguous meanings or conceptual overlap, were likewise omitted.

Subsequent to the refinement of the tool, the reliability coefficients for the items were ascertained to be 0.96, and for the individuals, 0.92. These findings suggest that the modified Sullivan Emotional Intelligence Scale for Children (EISC) is efficacious in assessing emotional intelligence among Malaysian preschoolers aged four to six years. The adapted instrument appears to be congruent with the cognitive and response capacities of children, indicating its potential to accurately evaluate the designated facets of emotional intelligence.

Table 6: Domains ability to identify emotions

Domain	Item	The original EISC	Adaptation of EISC	EISC after distillation
Ability to identify emotions	Test through facial expressions	1 AI  Scared Sad Mad	 Scared Sad Mad	
		2 AI  Happy Scared Surprised	 Happy Scared Surprised	
		3 AI  Happy Mad Sad	 Happy Mad Sad	Discard
		4 AI  Sad Scared Happy	 Sad Scared Happy	Discard
		5 AI  Sad Scared Mad	 Sad Scared Mad	
		6 AI  Happy Surprised Scared	 Happy Surprised Scared	
		7 AI  Sad Mad Scared	 Sad Mad Scared	
		8 AI  Mad Sad Scared	 Mad Sad Scared	
		9 AI  Surprised Happy Sad	 Surprised Happy Sad	Discard
		10 AI  Sad Mad Scared	 Sad Mad Scared	Discard
		11 AI  Mad Scared Sad	 Mad Scared Sad	Discard
		12 AI  Sad Scared Surprised	 Sad Scared Surprised	Discard
		13 AI  Scared Surprised Happy	 Scared Surprised Happy	
		14 AI  Mad Happy Sad	 Mad Happy Sad	Discard
		15 AI  Sad Scared Mad	 Sad Scared Mad	
		16 AI  Mad Happy Sad	 Mad Happy Sad	Discard
		17 AI  Scared Happy sad	 Scared Happy sad	
		18 AI  Mad Surprised Scared	 Mad Surprised Scared	Discard

Test through storytelling	19 AI	 <p>Sad Happy Scared</p>	 <p>Sad Happy Scared</p>	
	20 AI	 <p>Surprised Scared Happy</p>	 <p>Surprised Scared Happy</p>	Discard
	1 AII	It's bedtime, and Ben hears raindrops on the roof. Ben is just about to fall asleep when a bright of lightening fills her room, and a loud clap of thunder suddenly makes her wide awake. Point to the picture that best describes how Ben feels	While sleeping, Abu hears the raindrops on the roof. As Abu is about to drift off to sleep, suddenly, he is jolted awake by the loud thunder and flashes of lightning illuminating his room. Show Abu's feelings at that moment	
	2 AII	Rashad and his mother walk slowly out the back door. Rashad carries a small box to the backyard. Together, Rashad and his mother stop at the place where he has chosen to bury his pet turtle that died. Point to the picture that best describes how Rashad feels	Rashad and his mother slowly walk out from the back door of the house. Rashad carries a small box. They stop at a spot behind the house to bury his beloved cat, who has passed away. Show Rashad's feelings at that moment	
	3 AII	Ani loves horses, but she has never ridden a real horse. One day, her family goes for a drive to the country. When the car stops, Ani gets out and sees horses out in a field and a big stable where the horses live. She is told that she will have a chance to ride a horse. Point to the picture that best describes how Ani feels	Horses are Ani's favorite animals, but she has never ridden one. One day, Ani's family took her to a rural area. When they arrived at a certain place, Ani's father stopped the car. Ani got out and saw a horse in front of her. Ani's father allowed her to ride the horse. Show Ani's feelings at that moment	
	4 AII	Ali walks into the classroom with the model car he just built. He puts the car on his desk and gets ready for show and share time. Ali walks over to sharpen his pencil. When he gets back to his desk, he finds that someone has broken the wheels off of his car. Ali's face turns red, and he looks around the room. Point to the picture that best describes how Ali feels	Ali brings his toy car to class. He puts his toy car on the table to show it to his friends. Ali then goes to sharpen his pencil. When he returns to his desk, he finds that someone has broken the wheel of his toy car. Ali's face turns red, and he looks for who did it. Show Ali's feelings at that moment	
	5 AII	Four-year-old Atan and his mom are at the grocery store. Atan walks beside his mom until the toy section of the store catches his eye. He stops to look at the coloring books and toys. When he looks around, he realizes that his mom isn't there, and he doesn't see her anywhere. Point to the picture that best describes how Atan feels	Atan, who is four years old, is at the grocery store with his mother. Atan walks beside his mother until he sees a toy store. He stops to look at the coloring books and toys in the store. When he looks around, he realizes that his mother is no longer by his side, and she is nowhere to be seen. Show Atan's feelings at that moment	
	6 AII	Ten-year-old Jamil is playing in his last football game of the year. Jamil's dad hadn't been able to come to any of the games. At half-time, Jamil walks off the field and hears someone call his name. When Jamil looks up, he sees his dad sitting in the stands. Point to the picture that best describes how Jamil feels	Ten-year-old Jamil is playing in the last soccer match of the year. Jamil's father has never been present to watch him play in any match before. During half-time, Jamil walks off the field, and he hears someone calling his name. When Jamil looks up, he sees his father. Show Jamil's feelings at that moment	Discard
7 AII	Ani is playing with her friends one day on the playground. They are standing in a circle, tossing a blue ball back and forth to each other. When the ball is tossed to Annie, she just misses it, and the ball rolls across the playground. Annie runs over to get the ball, and she sees another girl pick it up and walk away with it. When Annie asks for the ball back, the girl laughs and says no. Point to the picture that best describes how Annie feels	One day, Annie was playing with her friends at the playground. They stood in a circle, tossing a blue ball back and forth to each other. When the ball was thrown to Annie, she failed to catch it. Annie ran to retrieve the ball, only to see another girl snatch it and run away. When Annie asked for the ball back, the girl laughed and refused to return it. Show Annie's feelings at that moment	Discard	
8 AII	Dani and his father are on the way to the zoo. Dani, who is eight years old, has been looking forward to seeing the animals for weeks. In the car, they talk about what a fun day it will be, and Dani is especially excited about seeing the polar bears. When they get to the zoo, Dani's dad parks the car. They get out and begin to walk up to the front gates of the zoo. At the gate, Dani and his dad read a sign that says the zoo is closed for repair. Point to the picture that best describes how Dani feels	Dani and his father are on their way to the zoo. Dani, who is eight years old, can't wait to see the animals. In the car, they're excitedly talking about the animals at the zoo. Dani is especially thrilled to see the polar bears. When they arrive at the zoo, Dani's father drives towards the parking area. They get out and start walking towards the front entrance of the zoo. Upon reaching the zoo gate, Dani and his father read the sign stating that the zoo was closed for maintenance. Show Dani's feelings at that moment	Discard	

Table 7: Domain ability to understand emotions

Domain	Item	The original EISC	Adaptation of EISC	EISC after distillation
Ability to Understand Emotions	1 B	Part I Janna is playing bicycle in the park one Saturday afternoon. She looks at her good friend sitting down right in her path. He is trying to fix his damaged bicycle. a. Would Janna feel sad that her friend's bicycle was damaged? b. Would Janna feel mad that he was sitting in her path?	Part I Janna was cycling in the park one Saturday afternoon. Suddenly, she saw her close friend sitting right in front of the path where Janna was cycling. Her friend was trying to fix a broken bicycle. a. Will Janna feel sad seeing her friend's bicycle broken? b. Will Janna feel angry seeing her friend sitting in front of her path?	Discard part II
		Part II When Janna sees her friend, she decides to stop and help him fix his bicycle. Janna accidentally runs over his foot while trying to stop, and she falls down hard c. Would he be happy that Janna wanted to help him? d. Would he be mad at Janna for running over his foot?	Part II When Janna saw her friend, she decided to stop and help her friend fix the broken bicycle. As she was stopping, Janna accidentally bumped into her friend and fell hard a. Will her friend be happy when Janna wants to help her? b. Will her friend be angry when Janna accidentally bumps into her?	
	2B	Part I Yong Hong and his big dog are outside in the yard playing with a ball. James throws the ball too hard, and the ball bounces out of the yard. The big dog runs out in the street to get the ball and is hit by a truck a. Would Yong Hong feel happy because his dog got hit? b. Would Yong Hong feel mad at the dog for getting hit?	Part I Yong Hong and his big dog were outside playing with a ball in their backyard. Yong Hong threw the ball too hard, and it bounced out of the yard. The dog ran into the street to get the ball and was hit by a truck a. Will Yong Hong feel happy because his dog was hit by a truck? b. Will Yong Hong feel angry at his dog for being hit by a truck?	

		Part II The driver stops his truck and rushes over to check on the dog. The dog is not hurt badly, but the driver's truck has a dent on the front. c. Would the driver feel sad that he hit the dog? d. Would the driver feel mad at the dog for denting his truck?	Part II The truck driver stopped and ran towards the big dog to check on it. The dog wasn't seriously injured, but the driver's truck had a dent in the front. c. Will the driver feel sad because he hit the dog? d. Will the driver feel angry at the dog for causing a dent in his truck?
		Part I Jane is playing outside on the playground when she realizes she has lost her bracelet. She looks for it but can't find it anywhere. She starts to feel like she'll never find it. a. Would Jane feel sad that she lost her bracelet? b. Would Jane be happy when she can't find it?	Part I Jun was playing outside in the playground when she realized that she had lost her bracelet. She searched for her bracelet but couldn't find it. a. Will Jun feel sad when she loses her bracelet? b. Will Jun feel happy when she doesn't find her bracelet?
3B		Part II The teacher comes over to help Jane find her bracelet. Together, they search the playground. The teacher finds the bracelet and returns it to Jane. c. Would Jane be mad at the teacher for trying to help? d. Would the teacher be happy that she found the bracelet for Jane?	Part II The teacher came to help Jun search for her bracelet. They searched together in the playground. The teacher found the bracelet and returned it to Jun. c. Will Jun feel angry when her teacher comes to help her? d. Will the teacher feel happy when she finds Jun's bracelet?

Table 8: Domains ability to control emotions

Domain	Item	The original EISC	Adaptation of EISC	EISC after distillation
Ability to control emotions	1C	You are playing a game with your friends on the playground. Suddenly, your friend makes fun of you, and it really hurts your feelings. a. Should you tell your friend that you don't like it when she makes fun of you? b. Should you yell at your friend? c. Should you make fun of your friend right back?	You are playing a game with your friends at the playground. Suddenly, your friend mocks you, and it really hurts your feelings. a. Should you tell your friends that you don't like it when they mock you? b. Should you scream at your friend? c. Should you retaliate with the same mocking at your friend to hurt their feelings, too? You want to listen to music in your room, but you can't find your new birthday gift CD. You spend a long time searching for it, and then you see your CD in your sibling's room. You have reminded your sibling not to take your belongings without asking first. a. Should you scream at your sibling for taking the CD without permission?	
	2C	You want to listen to some music in your room, but you can't find the new CD you got for your birthday. You spend a long time searching, and then you see the CD in your brother's room. You had already asked Mark not to take things without asking a. Should you yell at your brother for taking your CD? b. Should you stomp into your brother's room and grab the CD back? c. Should you remind your brother that he can listen to the CD if he'll just ask you first?	b. Should you rush into your sibling's room and snatch the CD back? c. Should you remind your siblings that they can listen to the CD if they ask for your permission first?	
	3C	Your teacher asks everyone in the classroom to work very quietly. You suddenly remember you are going to a pizza party after school. You become very happy just thinking about all the fun you will have. a. Should you get so excited that you jump up and down by your seat? b. Should you tell your friends right then how happy you are? c. Should you stay quiet and just wait to tell your friends later?	Your teacher asks everyone in the class to work quietly. Suddenly, you remember the birthday party you will attend after school. You become very excited thinking about the fun you will have later. a. Should you be so excited that you start jumping up and down in your seat in class? b. Should you continue to tell your friends in class how excited you are? c. Should you stay calm and just wait to tell your friends after class?	Discard

Table 9: Domains ability to use emotions

Domain	Item	The original EISC	Adaptation of EISC	EISC after distillation
Ability to Use Emotions	1D	Your best friend gets a new bike and is very happy. Would you feel happy for your friend?	Your good friend got a new bicycle and feels very happy. Would you also feel happy for your friend?	
	2D	A little girl is being hurt by someone much bigger. Would you feel sad for the girl?	A girl is being hit by someone much bigger. Would you also feel sad about the situation the girl is going through?	
	3D	A new boy at school wants to play but has no one to play with him. Would you feel happy for the boy?	A new boy at school wants to play, but nobody is available to play with him. Would you feel happy about the situation the boy is going through?	
	4D	A much smaller girl is crying because she is sad. Would you feel mad at the girl?	A smaller girl is crying because she is sad. Would you feel angry towards the little girl?	
	5D	Someone hurts a small animal. Would you feel sad for the animal?	Someone is hurting a small animal. Would you also feel sad seeing the animal?	
	6D	Your friend is being picked on and teased by someone. Would you feel happy and laugh too?	Your friend is being teased by someone. Would you feel happy and laugh too?	
	7D	A girl wants to be on a team, but no one chooses her. Would you feel sad for the girl and choose her to be on your team?	A girl wants to join a team, but nobody wants to pick her up. Would you also feel sad seeing the girl's situation and choose her to join your team?	
	8D	A boy finds his lost toy and is happy. Would you feel happy for him?	A boy finds his lost toy and feels happy. Would you feel happy about the situation the boy is experiencing?	Discard
	9D	A new girl at school wants to play but has no one to play with her. Would you feel sad for the girl and ask her to play?	A new girl at school wants to play, but no one wants to play with her. Would you also feel sad seeing the situation of the girl and invite her to play with you?	Discard
	10D	A much smaller boy is crying because he is sad. Would you feel mad at the boy?	A younger boy is crying because he is sad. Would you feel angry towards the boy?	Discard

Table 10: EISC instrument in Malaysian preschools context (A: Test through facial expressions)

No.	Item	1	2	3
1.	Pointing to a scared face picture			
2.	Pointing to a surprised face picture			
3.	Pointing to an angry face picture			
4.	Pointing to a happy face picture			
5.	Pointing to a sad face picture			
6.	Pointing to a shocked face picture			
7.	Pointing to a fearful face picture			
8.	Pointing to an angry face picture			
9.	Pointing to a surprised face picture			
10.	Pointing to an angry face picture			

Score: ____/10

A II: Test through storytelling

No.	Item	Happy 	Sad 	Angry 	Scared 
1.	As Abu was about to fall asleep, he heard the raindrops on the roof. Just as Abu was nearly drifting off, he suddenly woke up from his sleep when he heard a loud thunderclap and saw a bright flash of lightning illuminating his room. Show Abu's feelings at that moment				
2.	Rashad and his mother walked slowly out of the back door of the house. Rashad was carrying a small box. They stopped at a place behind the house to bury their beloved cat, who had passed away. Show Rashad's feelings at that moment				
3.	Horses were Ani's favorite animals, but she had never ridden one before. One day, Ani's family took her to a rural area. When they arrived at a certain place, Ani's father stopped the car. Ani got out and saw a horse in front of her. Ani's father allowed her to ride the horse. Show Ani's feelings at that moment				
4.	Ali brought his toy car to class. He placed his toy car on the table to show it to his friends. Ali then went to sharpen his pencil. When he returned to his desk, he found that someone had broken the wheel of his toy car. Ali's face turned red, and he searched for who had done it. Show Ali's feelings at that moment				
5.	Atan, who is four years old, is with his mother at the grocery store. Atan walks beside his mother until he sees a toy store. He stops to look at the toys in the store. When he looks around, he realizes that his mother is no longer by his side, and she is not visible anywhere. Show Atan's feelings at that moment				

Score: ____/5

Part B: Know to understand emotions

No.	Item	1 (No)	2 (Do not know)	3 (Yes)
Part 1				
1.	Janna is riding her bicycle in the park with her best friend. Suddenly, she sees her best friend stopping their bicycle in front of her. Her friend is trying to fix a broken bicycle. When Janna sees her friend, she decides to stop and help her friend fix the broken bicycle. As she stops, Janna accidentally bumps into her friend and falls hard.	1	2	3
	a. Will her friend be happy when Janna wants to help her?	1	2	3
	b. Will her friend be angry when Janna accidentally bumps into her?			
Part I				
2.	Yong Hong and his big dog are playing with a ball in the yard of his house. Yong Hong throws the ball too hard, and it bounces out of the yard. The dog runs onto the street to get the ball and is hit by a truck.	1	2	3
	a. Will Yong Hong feel happy because his dog was hit by a truck?	1	2	3
	b. Will Yong Hong feel angry at his dog because it was hit by a truck?	1	2	3
Part II				
	The truck driver stops and runs towards the big dog to check on it. The dog is not seriously injured, but the driver's truck has a dent in the front.	1	2	3
	c. Will the driver feel sad because he hit the dog?			
	d. Will the driver feel angry at the dog because it caused a dent in his truck?			
Part I				
3.	Jun is playing outside at the playground when he realizes that he has lost his bracelet. He searches for his bracelet but cannot find it	1	2	3
	a. Will Jun feel sad when he loses his bracelet?	1	2	3
	b. Will Jun feel happy when he doesn't find his bracelet?	1	2	3
Part II				
	The teacher comes to help Jun look for his bracelet. They search together in the playground. The teacher finds the bracelet and returns it to Jun	1	2	3
	c. Will Jun be angry when his teacher comes to help him?			
	d. Will the teacher feel happy when she finds Jun's bracelet?			

Score: ___/10

Part C: Know how to control emotions

No.	Item	1 (No)	2 (Don't know)	3 (Yes)
1.	You are playing a game with your friends at the playground. Suddenly, your friend mocks you, and it really hurts your feelings	1	2	3
	a. Should you tell your friends that you don't like it when they mock you?	1	2	3
	b. Should you yell at your friend?	1	2	3
	c. Should you retaliate with the same mockery towards your friend to hurt their feelings too?			
2.	You want to listen to music in your room, but you can't find your CD. You spend a long time searching for it, and then you see your CD in your brother's room. You have reminded your brother not to take your belongings without asking first	1	2	3
	a. Should you yell at your brother for taking the CD without permission?	1	2	3
	b. Should you rush into your brother's room and snatch the CD back?	1	2	3
	c. Should you remind your brother that he can listen to the CD if he asks for your permission first?			

Score: ___/6

Part D: Know how to use emotions

No.	Form of event	1 (No)	2 (Don't know)	3 (Yes)
1.	Your good friend got a new bicycle and feels very happy. Would you also feel happy for your friend?	1	2	3
2.	A girl is hit by someone much bigger. Would you also feel sad about the situation the girl is going through?	1	2	3
3.	A new boy at school wants to play, but no one is available to play with him. Would you feel happy about the situation the boy is going through?	1	2	3
4.	A younger girl is crying because she is sad. Would you feel angry at the little girl?	1	2	3
5.	A child is hitting a cat. Would you also feel sad seeing the cat?	1	2	3
6.	Your friend is teased by someone. Would you feel happy?	1	2	3
7.	A girl wants to join a team, but no one wants to pick her. Would you also feel sad seeing the situation of the girl and choose her to join your team?	1	2	3

Score: ___/7

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References

Coşkun K, Öksüz Y, and Yılmaz HB (2017). Ten years emotional intelligence scale (TYEIS): Its development, validity and reliability. *International Journal of Assessment Tools in Education*, 4(2): 122-133.

Creswell JW (2014). *Research design: Qualitative, quantitative, and mixed method approaches*. SAGE Publications, Los Angeles, USA.

Mayer JD and Salovey P (1997). What is emotional intelligence? In: Salovey P and Sluyter D (Eds.), *Emotional development and emotional intelligence: Educational implications*: 3-31. Basic Books, New York, USA.

Mayer JD, DiPaolo M, and Salovey P (1990). Perceiving affective content in ambiguous visual stimuli: A component of emotional intelligence. *Journal of Personality Assessment*, 54(3-4): 772-781.
<https://doi.org/10.1080/00223891.1990.9674037>
PMid:2348356

Mayer JD, Salovey P, and Caruso D (2002). The Mayer-Salovey-Caruso emotional intelligence test (MSCEIT). Multi Health Systems, Toronto, Canada.

Stoller JK (2021). Emotional intelligence: Leadership essentials for chest medicine professionals. *Chest*, 159(5): 1942-1948.
<https://doi.org/10.1016/j.chest.2020.09.093>
PMid:32956713

Sullivan AK (1999). The emotional intelligence scale for children. Ph.D. Dissertation, University of Virginia, Charlottesville, USA.

Ulutaş İ and Ömeroğlu E (2007). The effects of an emotional intelligence education program on the emotional intelligence of children. *Social Behavior and Personality: An International Journal*, 35(10): 1365-1372.
<https://doi.org/10.2224/sbp.2007.35.10.1365>