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## **Construct Validity and Reliability of Emotional Intelligence Scale**

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### **Abstract**

The purpose of this study is to test the construct validity and reliability of the emotional intelligence scale. It also wants to examine aspects and indicators that can form emotional intelligence variables. Emotional intelligence is measured by five aspects, which consists of self-awareness, self-regulation, self-motivation, empathy, and social skills. The population in this study are all "X" grade high school students in the city of Yogyakarta, with a total sample of 60 students. The sampling technique performed is simple random sampling technique. The data collection method is a scale of emotional intelligence. Research data were analyzed using Structural Equation Modeling (SEM) through the SmartPLS 3.2.8 program. Based on the results of data analysis, the aspects and indicators that shape the emotional intelligence variable met validity and reliability requirement. The most dominant aspect that reflects the emotional intelligence variable is self-regulation with a loading factor of 0.848. The weakest aspect reflecting the emotional intelligence variable is self-awareness with a loading factor of 0.613. This shows that all aspects and indicators are able to reflect and form emotional intelligence variables. Thus, the measurement model can be accepted because the theory that describes emotional intelligence variables fit with empirical data obtained from the subject.

**Keywords:** Empathy; Emotional Intelligence; Self-awareness; Self-regulation; Self-motivation; Social Skills; Structural Equation Modeling.

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## **1. Introduction**

High School is one of the levels of education in Indonesia. Individuals who study in high school are generally in the adolescent development phase. In the adolescent phase, individuals will face various changes both physically, cognitively and emotionally, so this phase is often referred to as the stress phases [1]. This phase will be passed well if the individual has the ability to control himself and one way to control this is through emotional control. A good emotions control will help individual form emotional intelligence.

Emotional intelligence refers to an individual's ability to recognize and control his emotions [2]. The research results showed that emotional intelligence is important to support the ability to cooperate and determine the goals of an activity [3,4]. In addition, emotional intelligence can also reduce stress and improve mental health [5,6,7,8]. Other studies reveal that emotional intelligence is a strong predictor of success in various aspects, such as life skills, mental health, and academic achievement [9,10,11,12]. In students, high emotional intelligence is related to academic performance and behavior in the classroom [13], so that with good emotional intelligence students can learn and develop their potential better [14,15,16]. Conversely, low emotional intelligence has an impact on the difficulty of students' adjustment to various academic demands [17], low ability to adapt, poor academic achievement, low social competence and high deviations in schools [13,18,19].

Adolescents are still unstable emotionally which makes them unable to control their emotion. This has an impact on his social life. Yet at that age, a teenager is more intense and closer to the social environment, for example with his peers. Unstable emotions and the way teens express negative emotions sometimes make a detrimental impact on themselves and others. One example is when a teenager is angry at his friend's treatment, he will also respond to it with actions that he also thinks are worth it. When teenagers have good emotional intelligence, they will be able to control their anger as much as possible and refrain from acting as they please. Besides, uncontrolled emotions also have an impact on academic life.

Reference [20] introduced the term "emotional intelligence" in the early 1990s. Early in the 1920s some experts began researching and measuring emotional intelligence. Reference [21] was one of the first experts to try to define this intelligence as a form of "emotional intelligence". Then Reference [22] developed knowledge about interpersonal and intrapersonal intelligence in the mid-1980s. Reference [23] then developed the concept of emotional intelligence and tried to study the various benefits of emotional intelligence, until finally the researchers agreed that emotional intelligence was important for achievement, both academic and career achievements [24].

Reference [21] initially assumed that emotional intelligence was one component of intelligence measured using IQ scores, but in the end, it distinguished social intelligence from other forms of intelligence. Then Reference [25] agrees with Thorndike's findings which state that emotional intelligence is not only different from academic intelligence, but also included in the part the people's life. Reference [22] in his theory has an opinion about multiple intelligences, that traditional IQ tests can measure linguistics, logical-mathematical intelligence and spatial intelligence. Intrapersonal intelligence deals with the ability to recognize and understand components of one's mind such as feelings, reactions and aspirations. While interpersonal intelligence includes the ability of

individuals to interpret moods, temperaments, motivations and intentions possessed.

Reference [20] together define emotional intelligence as the ability of individuals to monitor their own feelings and emotions and those of others, and which information is used to guide individual thoughts and actions. Emotional intelligence is divided into four components which include perception, judgment and emotional expression; emotional support for thinking; understand and analyze emotions and their application; and reflection on emotional regulation to help emotional and intellectual growth [26].

Reference [23] suggests several aspects of emotional intelligence, namely self-awareness, self-regulation, self-motivation, empathy, and social skills. Knowing and managing emotions involves the abilities of individuals to feel emotions that arise and handle those feelings appropriately. Motivation is described as a means of channeling emotions in achieving goals, delaying pleasure, and oppressive events. Empathy is respecting differences with others and being sensitive to what other people feel and social skills is abilities and skills in socializing with others.

Reference [27] argues that emotional intelligence is the ability of individuals to motivate themselves and survive frustration, control impulse, not to exaggerate pleasure, regulate mood and to keep stress from crippling the ability to think, empathize and pray. Reference [28] defines emotional intelligence as the ability to learn from experience, and the ability to communicate with the surrounding environment. Furthermore, Reference [26] define emotional intelligence as intelligence that describes a number of skills related to the accuracy of the assessment of emotions about oneself and others, and the ability to manage feelings to motivate, plan and achieve life goals.

Reference [29] describe emotional intelligence as the ability to feel, understand and effectively apply emotional power and sensitivity as a source of energy, information, correction and humane influence. Emotional intelligence requires feelings to learn to acknowledge, respect feelings for yourself and others and respond appropriately, effectively applying emotional energy in everyday life. Reference [30] suggest that emotional intelligence is a series of skills possessed by individuals including the personal, social, and defense aspects of all intelligence, common sense and sensitivity that are essential to functioning effectively every day. Commonly, emotional intelligence is referred to as "street smart", or special abilities that we call "common sense".

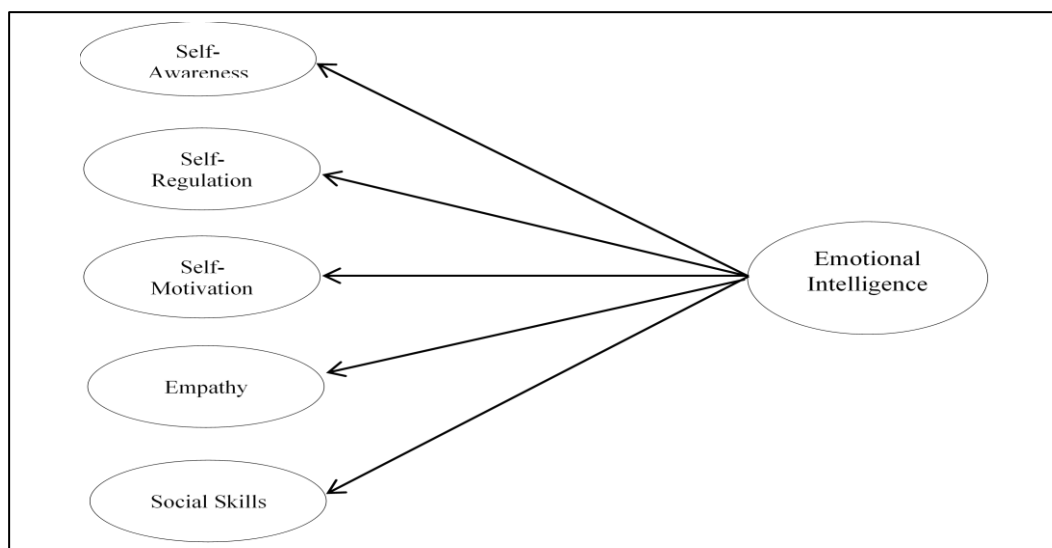
Based on the opinions of the experts above, it can be concluded that emotional intelligence is an intelligence and skills related to the ability to recognize one's own emotions and others, the ability to manage one's own emotions and relationships with others, as well as the ability to motivate oneself and apply it effective in everyday life to achieve better life goals.

Emotional intelligence consists of several aspects. Reference [27] puts emotional intelligence to expand these capabilities into five main aspects, namely as follows: First, self-awareness is related with the ability to recognize the feelings when those feelings occur. The ability to recognize self-emotion is the basis of emotional intelligence. In this aspect of knowing oneself, there are two indicators, namely knowing and feeling one's own emotions, and understanding the cause of feelings that arise. Second, self-regulation means maintaining feelings

so that feelings are expressed in accordance with self-awareness. Control does not mean suppressing emotions but it rather works as emotional balance in which every feeling has value and meaning. Reference [27] states that self-regulation is a natural emotion, and a harmony between feelings and the environment. When emotions are too suppressed, boredom will be created. Keeping troubling emotions under control is the key to emotional well-being. Excessive emotions can increase our stability. In the aspect of self-regulation, there are two indicators like ability to control anger and ability to control aggressive behavior that can damage oneself and others.

Third, self-motivation, managing emotions as a measure to achieve goals is an important thing with regard to paying attention to motivating oneself to control and to react. Refrain from satisfaction and control of impulse are the foundation of success in various fields. People who are able to motivate themselves are people who have the characteristics of being able to control anxiety, have a positive mindset, optimism, are able to achieve a state of flow that is the state when the individual fully merges into what they are doing, his attention is only focused on what he is doing, and awareness merges with action. In this aspect of self motivation, there are two indicators, namely being optimistic and ability to focus on the task at hand.

Fourth, empathy is the ability of individuals to recognize other people or care, and show the ability of empathy. Individuals who have the ability to empathize are better able to pick up on hidden social signals that sing what others need so that they are more able to accept other people's perspectives, be sensitive to other people's feelings and more able to listen to others. Individuals who have high empathy are better able to pick up on signals that are needed or desired by others. In the aspect of empathy, there are two indicators, namely having an attitude of empathy or sensitivity towards others and being able to listen to others. Fifth, social skills are skills to relate to other people which are emotional skills that support success in associating with others. Relationship building skills are skills that support popularity, leadership and interpersonal success [27]. Individuals who are great at this skill will succeed in any field related to interacting with others. In the aspect of fostering this relationship there are two indicators: having the ability to communicate with others and being democratic.



**Figure 1:** Conceptual model of emotional intelligence

Based on Figure 1 above, the hypotheses proposed in this study are 1) The emotional intelligence scale measurement model that is fit with empirical data is formed. 2) The aspects of self-awareness, self-regulation, self-motivation, empathy, and social skills are able to form emotional intelligence variables.

One approach that can be used in testing the construct of a measuring instrument is Confirmatory Factor Analysis (CFA). Confirmatory Factor Analysis (CFA) is one of the main approaches in factor analysis. It can be used to test aspects of a construct. This test is used to measure the model (model measurement) so that it can describe aspects in reflecting latent variables, namely emotional intelligence by looking at the loading factor of each aspect that forms a construct. Confirmatory Factor Analysis (CFA) is also used to test the construct validity and construct reliability of the indicators (items) forming latent constructs [31]. Confirmatory Factor Analysis (CFA) used in this study is the second order Confirmatory Factor Analysis (2nd Order CFA), a measurement model that consists of two levels. The first level of analysis is carried out from aspects to its indicators and the second analysis is carried out from latent variables to its aspects [31].

Based on the description above, the formulation of the problems in this study are: 1) Is the emotional intelligence scale valid and reliable? 2) Are aspects of self-awareness, self-regulation, self-motivation, empathy, and social skills able to form variables of emotional intelligence? The purpose of this study is to test the construct validity and reliability on the emotional intelligence scale, and examine aspects and indicators that can form this variable.

## **2. Research Method**

### ***2.1. Population, and Sample***

The population in this study were all "X" high school students in the city of Yogyakarta. The sample in this study were 60 "X" high school students. The sampling technique in this study uses simple random sampling technique.

### ***2.2. Data Collection Method***

Emotional intelligence was measured using a scale of emotional intelligence with a Likert scaling model. The scale of this study was arranged by researchers by referring to aspects of emotional intelligence according to Reference [27] consisting of self-awareness, self-regulation, self-motivation, empathy and social skills. Example items on the self-awareness aspect are "I am anxiously waiting for the results of the exam" and "I do not understand the feelings that arise when I see a natural disaster". Examples of items in the self-regulation aspect are "I stroked my chest to ease resentment" and "I cursed at a friend who accidentally stepped on my foot". Furthermore, examples of items in the aspect of self-motivation are "I believe I can achieve my goals if I persevere in undergoing the process" and "I have difficulty starting something when I have experienced failure". Then the example items on the empathy aspect are "I stopped doing other activities when parents advised" and "I was indifferent to classmates who were hit by disaster". Examples of items on the aspect of social skills are "I like to solve problems by deliberation" and "I speak rudely to people who ask for help". Blueprint as a reference in developing emotional intelligence scale can be seen in table 1.

**Table 1:** Blueprint of emotional intelligence scale

Aspect	Indicators	Item Number		Total
		Favourable	Unfavourable	
Self-awareness	1. Know and feel your own emotions	1,2,11,12	21,22,31,32	8
	2. Understand the cause of feelings that arise			
Self-regulation	1. Able to control anger better	3,4,13,14	23,24,33,34	8
	2. Can control aggressive behavior that can damage yourself and others			
Self-motivation	1. Be optimistic	5,6,15,16	25,26,35,36	8
	2. Being able to focus attention on the task at hand			
Empathy	1. Having an attitude of empathy or sensitivity towards others	7,8,17,18	27,28,37,38	8
	2. Being able to listen to other people			
Social Skills	1. Having the ability to communicate with others	9,10,19,20	29,30,39,40	8
	2. Being democratic			
Total		20	20	40

### 2.3. Construct Validity and Construct Reliability

To test the construct validity and construct reliability, this study uses the outer model testing through the smartPLS 3.2.8 program. The construct validity test consists of convergent and discriminant validity tests. Convergent validity can be seen from the loading factor and Average Variance Extracted value of  $> 0.5$  [32].

According to [33] the higher the loading factor score, the more important the role of loading will be in interpreting the factor matrix. a loading factor and AVE value of  $> 0.5$  are considered significant [32]. While discriminant validity can be seen from comparing the roots of the Average Variance Extracted (AVE) between aspects in which it must be higher than the correlation with other aspects [32].

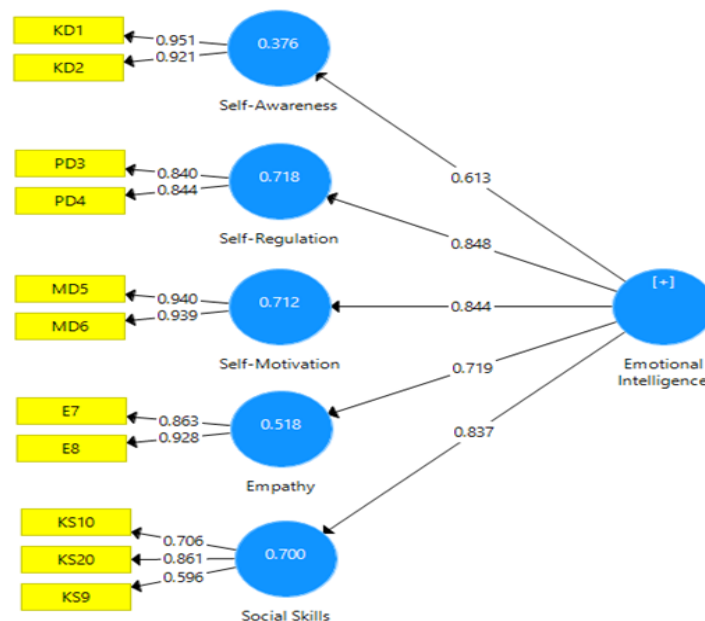
The construct reliability test was conducted to show the internal consistency of the measuring instrument by looking at the value of composite reliability and Cronbach alpha. The higher value would indicate the consistency of each item in measuring latent variables. According to [33] the expected composite reliability and Cronbach alpha values are  $> 0.7$  and  $0.6$  values are still acceptable [32].

## 2.4. Data Analysis

The data in this study were analyzed using the outer model with the CFA 2nd Order approach through the SmartPLS 3.2.8 program. According to [34] Partial Least Square (PLS) is a variant-based Structural Equation Model (SEM) that can simultaneously test measurement models to test the construct validity and reliability.

## 3. Result

The results of outer model testing on the emotional intelligence scale that has been done using the smart PLS 3.2.8 program can be seen in Figure 2 below.



**Figure 2:** Output outer model of emotional intelligence scale

## 3.1. Construct Validity Test

### 3.1.1. Convergent Validity

Convergent validity test are performed by testing the outer model seen from the loading factor value and

Average Variance Extracted (AVE). Based on the data analysis, it was found that the value of loading factors from variables to aspects and from aspects to indicators is  $> 0.5$ . Loading factor weights of 0.5 or more are considered to have validation that is strong enough to explain latent constructs [33]. The results of convergent validity testing can be seen in table 2 and table 3.

**Table 2:** Loading factor values (variable - aspect)

Aspect	Loading Factor	Explanation
Self-awareness	0.613	Valid
Self-regulation	0.848	Valid
Self-motivation	0.844	Valid
Empathy	0.719	Valid
Social Skills	0.837	Valid

**Table 3:** Loading factor values (aspect - item)

Item	Loading Factor	Explanation
KD1	0.951	Valid
KD2	0.921	Valid
PD3	0.840	Valid
PD4	0.844	Valid
MD5	0.940	Valid
MD6	0.939	Valid
E7	0.863	Valid
E8	0.928	Valid
KS10	0.706	Valid
KS20	0.861	Valid
KS9	0.596	Valid

Furthermore, the results of the convergent validity test show the Average Variance Extracted (AVE) value is  $> 0.5$ . The Average Variance Extracted (AVE) value of the emotional intelligence variable is 0.504 and it can be seen in table 4.

**Table 4:** The AVE value of emotional intelligence

Aspect	AVE	Explanation
Self-awareness	0.803	Valid
Self-regulation	0.877	Valid
Self-motivation	0.883	Valid
Empathy	0.709	Valid
Social Skills	0.532	Valid



### 3.1.2. Discriminant Validity

The results of discriminant validity test shows that the root value of the Average Variance Extracted (AVE) in each aspect is higher than the value of the Average Variance Extracted (AVE) in other aspects, so the discriminant validity criteria are met. The root value of Average Variance Extracted (AVE) emotional intelligence variable can be seen in table 5.

**Table 5:** Average Variance Extracted (AVE) root value of emotional intelligence

Aspect	Self-awareness	Self-regulation	Self-motivation	Emphaty	Social Skills
Self-awareness	0.936	0.677	0.256	0.434	0.478
Self-regulation	0.677	0.842	0.607	0.502	0.631
Self-motivation	0.256	0.607	0.940	0.515	0.707
Empathy	0.434	0.502	0.515	0.896	0.420
Social Skills	0.478	0.631	0.707	0.420	0.729

### 3.2. Construct Reliability Test

Construct reliability testing is done by testing the outer model which is seen from the value of composite reliability and Cronbach alpha. This test is done by looking at the value of composite reliability and Cronbach alpha of  $> 0.7$  which means that the scale in this study is reliable. The composite reliability and Cronbach alpha values can be seen in table 6.

**Table 6:** Composite reliability and Cronbach alpha value of emotional intelligence variable

Variable	Cronbach Alpha	Composite Reliability	Explanation
Emotional intelligence	0.909	0.888	Reliable

The results of the construct reliability test in table 6 shows that the emotional intelligence scale has good reliability and it means that the aspects that measure the emotional intelligence variable meet the unidimensional criteria [33]. This is indicated by the value of composite reliability of 0.909 and Cronbach alpha value of 0.888. The analysis of research data using the outer model testing shows that the measurement model can be accepted, because all aspects are able to reflect the variables formed.

## 4. Discussion

Based on the results of the analysis of construct validity and construct reliability, the aspects and indicators that make up the emotional intelligence variable are declared valid and reliable. This shows that all aspects and indicators are able to reflect and shape emotional intelligence variables. The most dominant aspect that is able to reflect emotional intelligence is self-regulation seen from the loading factor value of 0.848. The aspect of self-regulation is illustrated by the ability of students to control anger better and be able to control aggressive

behavior that can damage themselves and others. Valid and reliable indicators show that when they are upset, students stroke their chests to ease frustration. In addition, students distract themselves when they want to hit a friend. The weakest aspect which reflects emotional intelligence is self-awareness with a loading factor value of 0.613. Self-awareness is illustrated by the ability of students to recognize and feel their own emotions, and understand the causes of feelings that arise. Valid and reliable indicators show that students are enthusiastic when leaving school, and students know what causes lazy learning.

The results of previous studies on the variables of emotional intelligence that are relevant to this study also explained the validity and reliability of them, including Besharat's study [35] which proved that the emotional intelligence scale meets the reliability requirements with a Cronbach alpha value of 0.880. Other research results that also explain the validity and reliability is the research of [36] proving that the scale of emotional intelligence meets the reliability requirements with a Cronbach alpha value of 0.850. Furthermore, research by [37] which also explained the validity and reliability showed that the emotional intelligence scale met the reliability requirements with a Cronbach alpha value of 0.860. The results of Ibrahim's research [38] also show that the emotional intelligence scale meets the reliability requirements with a Cronbach alpha value of 0.842. Furthermore, Reference [39] research also showed that the emotional intelligence scale met the reliability requirements with a Cronbach alpha value of 0.750. This when compared with the results of this study shows that the emotional intelligence scale from the results of this study is also appropriate to be used or applied in expressing emotional intelligence in students, because the analysis results show that this emotional intelligence scale has better and reliable validity and reliability with composite reliability at 0.909 and Cronbach alpha at 0.888.

The results of this study are expected to provide an overview of the validity and reliability of the emotional intelligence scale in the context of high school students so that it can be used in research data collection and be a reference in subsequent research related to emotional intelligence.

## **5. Conclusion**

Based on the results of the analysis and discussion, it can be concluded that: 1) The emotional intelligence scale meets the validity and reliability requirement. 2) All aspects and indicators can form emotional intelligence variables, namely self-awareness, self-regulation, self-motivation, empathy, and social skills. The aspect that has the most dominant influence on emotional intelligence is self-regulation and the weakest aspect that reflects emotional intelligence is self-awareness. In this study, emotional intelligence scale measurement model was formed which is in accordance with empirical data obtained from the subject.study

## **6. Limitation and Recommendation**

This study has several limitations, among others, this study is limited to the subject of high school students in one school, so the results of this study cannot be generalized to other school subjects. Another limitation is the age and level of education of the subject, subjects in this study are limited to subjects with high school, so this scale cannot be used in subjects at other levels of education. The data analysis technique used is to build a model

so that it can only see the suitability of the theory with the research subject at the research location. For further research one must be able to conduct research with more subjects and support a broader range. Data analysis techniques used in subsequent studies can use SEM techniques so that the model can be used, so that the model made becomes more adequate.

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