

Development of the Big Five Factors Personality Tests for Elementary School Students and Secondary School Students

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Abstract

The research aimed to synthesize behavioral indicators, develop and analyze the quality of the Big Five Factors Personality tests: face validity, discrimination, reliability, construct validity along with creating local norms. The conceptual framework aligns with the Big Five Factors of Personality proposed by Costa & McCrae (1992). The samples were 5,521 students, consisting of 2,705 elementary school students and 2,816 secondary school students in the North of Thailand. Data collection utilized open-ended questionnaires to gather behavioral indicators, and the Big Five Factors Personality tests comprised short situations with three choices with three behavioral levels according to Allport (1955).

The research found that the Big Five Factors Personality tests consisted of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness with 30 Habitual Responses and 83 Specific Responses. Two tests were developed, one for elementary school students and another for secondary school students. Each test consisted of 83 short situational items. The quality of the tests was ensured through face validity based on the opinion of at least four out of five experts who agreed all passed situational items (100%). The discriminant range ranges between .082-.497 and .040-.536 were more than the critical .052 value in the table statistically significant at the .05 level. Reliability analysis of Cronbach's alpha coefficient values ranged between .666 - .821 and .672 - .806 higher than .60 almost equal to 1.00. The personality model demonstrated construct validity with factor loadings for each item at a .01 significant level indicating that the personality model aligns with the empirical data (variation). The local norms categorized scores into three stanine score levels: 1-3, 4-6, and 7-9, representing inferior, moderate, and outstanding personality, respectively.

Keywords: Big five Factors; Personality; Test

Introduction

Personality is the characteristic that identifies an individual (Guiford, 1959, p. 7). Personality refers to the psychological characteristics of each person that manifests itself in behavior and thought (Samuel, 1981, p. 3). Studying personality helps us understand or predict the behavior of individuals in the future. What personality or behavior will a person have in the future? It is a result of the personality in a person's present (Hall & Lindzey, 1970, p. 119). Personality in childhood inevitably influences personality in adolescence and adulthood. The adolescent stage is particularly critical and characterized by more pronounced conflicts compared to other stages. If the crisis state and conflicts cannot be resolved effectively, the individual may become a confused adolescent and evolve into an adult with an unstable and uncertain personality. Conversely, if the individual can address the crisis and conflicts

effectively, it leads to a desirable personality, affecting stable personality development (Erikson, 1968 cited in Ryckman, 1997).

The study of personality has been conducted over many years, resulting in multiple theories, explanations, and diverse methodologies. These are referred to as 'theories,' and each theory has its limitations, strengths, and distinct perspectives. The appropriate choice of any theory depends on the context because each theory attempts to explain using different principles and concepts. The personality of an individual can be explained by one perspective but may not be described by others. Some personality types require the integration of multiple theories to provide a comprehensive explanation. For instance, Eysenck's theory (Eysenck, 1969) and Guilford's structure theory (Guilford, 1959) organize personality into four similar levels, including Specific Responses, Habitual Responses, Traits, and Personality types.

Researchers have studied personality characteristics and attempted to differentiate various personality factors. They classify individuals based on trait tendencies and ways of expression in different situations. Each individual demonstrates distinct behaviors in other circumstances. This categorization is known as the 'Trait Personality Theory.' Personality can be understood by identifying the fundamental properties that give rise to human behavior, including components that demonstrate resilience, basic mental characteristics, and encompassing behaviors in different circumstances. Although the naming of each component may vary, in recent years, the nomenclature of each aspect based on the ideas of Costa & McCrae (1992) has been widely adopted in research, known as 'The Five-Factor Model of Personality,' which includes Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness.

Costa & McCrae (1992) further developed various sets of personality tests, including the Neuroticism-Extroversion-Openness Inventory (NEO-I). This was the initial test to measure the three dimensions of personality according to the five-factor personality theory: emotional instability, openness to exposure, and openness to experiences. Subsequently, they improved and modified the test by adding components such as agreeableness and conscientiousness, renaming it the NEO Personality Inventory (NEO PI). For this newer version, 'NEO' is pronounced as 'neo.' The inventory has been continually updated, leading to versions like NEO PI-3 and the revised and refined NEO PI-R up till present. At times, abbreviations have been created to aid in remembering the five components, such as NEOAC, OCEAN, CANOE, and more.

The NEO PI-R test currently used comprises two formats: the Self Report (Form S), in which the test taker evaluates themselves, and the Observer Rating (Form R), in which observers provide the ratings. Both formats consist of 240 questions using a Likert-type scale with 5 levels ranging from 'strongly disagree' to 'strongly agree.' This assessment is intended for adults aged 17 and above. Additionally, there is a shorter version of the test, the NEO Five-Factor Inventory (NEO FFI), consisting of 60 questions. The assessments can be in paper form, computerized testing, or mail-in testing, where the completed test is sent back for evaluation by experts to generate and return the test result reports. Both the full and abbreviated versions of the test have been reviewed. The questions were revised in 2010 under the names NEO Personality Inventory 3 (NEO PI 3), NEO FFI 3 (NEO Five-Factors Inventory 3), and NEO PI-R (the Revised NEO Personality Inventory). While the NEO test PI-R has been released, NEO PI 3 and NEO FFI 3 have also updated their standard data and new formats.

The NEO PI-R test and the NEO FFI short version are widely used in countries such as China (McCrae, Costa, & Yik, 1996; Yik & Bond, 1993), Estonia and Finland (Pulver, Allik, Pulkkinen & Härmäläinen, 1995), Philippines and France (McCrae, Costa, del Pilar, Rolland, & Parker, 1998) India (Lodhi, Deo, & Belhekar, 2002), Portugal (Lima, 2002), Russia (Martin, Darguns, Oryol, Senin, Rukavishnikov, & Klotz, 1997), South Korea (Piedmont & Chae, 1997), Turkey (Gülköz, 2002), Vietnam (Leininger & McFarland, 2002), etc.

In Thailand, Choochai Sumitthikul (2008) translated the NEO Five-Factor Inventory (Form S) into Thai. This translation has been utilized as an instrument to study personality Traits that predict counterproductive work behaviors among civil servants and officials in government agencies, and private company employees in the upper northern region provinces. It is a Likert-type scale with 5 levels, suitable for adults aged 17 and above. Additionally, Adisorn Wongmek (2006) developed a measure of personality with five factors based on the Costa & McCrae model, using a 4-level Likert-type scale with 75 items. It can be observed that the development of personality measures in foreign contexts predominantly involves estimation measures suitable for adults. Thailand has only translated the NEO Five-Factor Inventory (Form S) personality test in Thai adults and development of a five-component personality scale that is a 4-level estimation scale for students in grade 4 only. Therefore, the development of measures capturing different characteristics, beyond estimation measures, is limited.

The study of a fundamental education curriculum emphasizes and instills the development of Desirable Traits in all students, and these desired Traits will have behavioral characteristics related to each student's personality. Coupled with the challenge of finding reliable quality instruments to measure behavioral indicators in each component of personality, utilizing foreign instruments with Thai students may not be appropriate as each culture has its context of upbringing, character cultivation, and encountering diverse situations. Thailand still lacks standardized instruments to accurately measure students' personality. The researchers recognized the importance of a measure of personality with five core components that would be useful in assessing critical aspects of students' personality. The measurement results can be used to develop students' personalities in line with the goals of Thai education. Therefore, the researchers studied the creation and development of a measurement instrument for the five fundamental components of personality for elementary school and secondary school students.

Research Objectives

1. To synthesize behavioral indicators of the big five factors of personality.
2. To develop and analyze the quality of the Big Five Factors Personality tests: face validity, discrimination, reliability, and construct validity.
3. To create local norms for the big five factors of personality.

Literature Review

The experts have studied personality Traits and tried to classify the factors of different personalities, classifying people according to their personality tendencies (Trait) and how they express themselves in different situations. Each person acts differently in different situations. This group of theories is called “Trait Personality Theory”. Personality can be understood and identify the basic qualities that cause human behavior. It includes elements of behavior that demonstrate tolerance, mentality, and behavior in various situations. Although the naming of each element varies, some have appeared in research over the years. Naming each element according to the concept of Costa and McCrae (1992) has been widely used called “The Five-Factor Model of Personality” as follows: Neuroticism which is the characteristic of a person who worries all the times with no confidence, a person who is highly responsible, often feels guilty, and tends to experience negative emotions easily. Extroversion: is a characteristic of a person who likes relationships, likes to socialize in groups, and has self-expression, suitable for work such as journalists, radio programmers, actors, musicians, public relations, etc. Openness to Experience: is a personality trait that is open to novelty, curious, creative, suitable for jobs such as surveyor, mechanic, programmer, etc. Agreeableness: is a characteristic of a person who likes to be lenient with others, can coordinate, is trustworthy, suitable for the nature of work, such as tourist service, guidance counselor, social worker, welfare worker, recreational worker, etc. Conscientiousness: is a characteristic of a person who can be trusted, does everything with a purpose, and has morality, ethics, and responsibility, and is suitable as a consultant, management, etc.

Eysenck (1969: 13-15) explained that personality consists of four levels of behavior which were organized in stages from the lowest level to the highest level, namely the specific response level, the habitual response level, the trait level, and the types level.

Guilford (1959: 99-103) had a similar opinion as Eysenck (1969). He believed that personality is structured according to class and personality models used a factors model for explanation. Personality is structured according to levels, consisting of personality Traits in four different levels of generalization: Specification, Hexis, Primary Trait, and Type.

Research Methodology

Phase 1: Synthesize behavioral indicators of the Big Five Factors Personality

The samples were 428 students consisting of 188 elementary school students and 240 secondary school students in the Northern region of Thailand, The sample size was determined using the Taro Yamane table (1973) at a confidence level of 95%. The sampling method was multistage random sampling in the upper-lower Northern region, outside-inside the city, small-medium-large sized schools, and class level.

The instruments were open-ended questionnaires with the five factors personality. Each factor comprised 30 Habitual Responses(HRs). Each HRs included 4 questions related to characteristics of behavioral indicators and opposite behavioral indicators. For example, HR1 anxiety: 1. How does a friend with 'anxious' characteristics behave or gesture? 2. How do you feel about a friend with 'anxious' characteristics?, 3. How does a friend with 'non-anxious' characteristics behave or gesture?, and 4. How do you feel about a friend with 'non-anxious' characteristics?

The methods involved: **Step 1** set a purpose for creating The Big Five Factors Personality tests. **Step 2** studied the theories, concepts, and meanings of the words 'personality'

and 'big five factors personality' to analyze the behaviors of the five factors. **Step 3** defined the five factors: Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. **Step 4** studied the measurement instruments five factors included how to create and analyze the quality of the instruments. **Step 5** created a theoretical model of the Big Five Factors of Personality by applying Eysenck's personality theory (1959), Guilford's personality theory (1959), and Costa & McCrae's five-factor theory of personality (1992). **Step 6** used open-ended questionnaires to collect qualitative data on the characteristics of HRs' behavioral indicators and opposite behavioral indicators. These characteristics reflected actual behaviors that occur in students' daily lives which can be measured and observed. **Step 7** analyzed characteristics of HRs' behavioral indicators with content related to Costa & McCrae's five-factor theory of personality (1992). **Step 8** grouped similar behavioral indicators. The top three highest-frequency behavioral indicators were selected as SRs and the name of each SR was created. **Step 9** defined the format of the Big Five Factors Personality test as a short situations test. **Step 10** studied several experts' theories, concepts, and meanings of each HR to define definitions and determine the main situations. **Step 11** created specific situations again based on students' answers from the open-ended questionnaire. **Step 12** synthesized behavioral indicators level according to Allport's trait theory (1955) of dividing personality based on individual Traits.

Phase 2: Create and analyze the quality of the Big Five Factors Personality tests: face validity, discrimination, reliability, and construct validity.

The samples were 5,093 students in the Northern region of Thailand. The samples were divided into 2 groups: experiment 1 consisted of 508 elementary school students and 514 secondary school students, and experiment 2 consisted of 2,062 elementary school students and 2,009 secondary school students. The sample size was determined using the Taro Yamane table (1973) at a confidence level of 95%. The sampling method was multistage random sampling in the upper-lower Northern region, outside-inside the city, small-medium-large sized schools, and class level.

The instruments were the Big Five Factors Personality test. There were 2 tests for elementary school students and secondary school students. There were short situational tests.

The methods involved: **Step 1:** created the Big Five Factors Personality test. **Step 2:** for each test; Create 90 short situations align with 90 SRs. **Step 3:** for each situation; Create 3 choices where responses align with Allport's trait theory (1955) that the scoring criteria for each item are 1, 2, 3, indicating behavioral indicators levels of personality with inferior, moderate, and outstanding, respectively. **Step 4:** the five experts: three measurement experts and two psychology experts. They considered the face validity and appropriateness of the languages. They determined whether each situational item could measure the behavioral indicators of the 90 SRs or not. Additionally, they determined whether each choices could measured according to behavioral indicators level or not. The criterion for the experts' consensus was at least four out of five experts agreed. **Step 5:** experiment with a small group. The test was administered to nine students representing three high, three moderate, and three low achievers. Subsequently, the students were questioned about their understanding of the language used in both the situational items and the choices, as well as their feelings about taking the measurement. The feedback was utilized to make improvements. **Step 6:** the first experiment was conducted with 508 elementary school students and 514 secondary school students. Discriminant was analyzed by calculating the Pearson Product-Moment Correlation

Coefficient between item scores and the total score with the item score removed. The correlation coefficients that demonstrated positive correlations were considered. The statistical significance was tested at the .05 level. Subsequently, reliability was analyzed by calculating Cronbach's alpha coefficient. **Step 7:** the second experiment was conducted with 2,062 elementary school students and 2,009 secondary school students. Discriminant was analyzed by calculating Pearson's Product-Moment Correlation Coefficient between item scores and the total score with the item score removed. The correlation coefficients that demonstrated positive correlations were considered. The statistical significance was tested at the .05 level. Subsequently, reliability was analyzed by calculating Cronbach's alpha coefficient. **Step 8:** structural validity was analyzed by factor analysis to determine the weights of each factor. Items with statistically significant factor loadings at the .01 level were selected.

Phase 3: Create local norms for the Big Five Factors Personality tests

The samples were 4,071 students consisting of 2,062 elementary school students and 2,009 secondary school students in the Northern region of Thailand. The sample size was determined using the table of Yamane (1973) at a confidence level of 95%. The sampling method was multistage random sampling in the upper-lower Northern region, outside-inside the city, small-medium-large sized schools, and class level.

The methods involved: **Step 1** the raw scores from the second experiment; were calculated the percentile rank. Then, the calculated or computed stanine scores were standardized ranging from 1 to 9. **Step 2:** divided the stanine score into 3 equal ranges: 1 to 3 indicating inferior personality, 4 to 6 indicating moderate personality, and 7 to 9 indicating outstanding personality. **Step 3:** created two manuals on how to use; the Big Five Factors Personality test for elementary school students and secondary school students.

Research Conceptual Framework

The researcher defined the research conceptual framework based on the concepts of Costa & McCrae's five-factor theory of personality (1992) together with Eysenck's personality theory (1959), and Guilford's personality theory (1959). A theoretical model of the Big Five Factors Personality was categorized into four levels. The first level was the personality model. The second level comprised behaviors organized according to personality characteristics, denoted by 'Traits' or 'Ts' which are divided into five Traits represented by the symbols T_1 , T_2 , T_3 , T_4 , T_5 . The third level encompasses sub-personality characteristics referred to as 'Habitual Responses' or 'HRs'. Each Trait was subdivided into 6 HRs, a total of 30 HRs, represented by the symbols HR_1 , HR_2 , HR_3 , ..., HR_{30} . The fourth level encompasses the 'Specific Responses' or 'SRs' levels. Each HR was further subdivided into 3 SRs, a total of 90 SRs, represented by the symbols SR_1 , SR_2 , SR_3 , ..., and SR_{90} which are presented as follows.

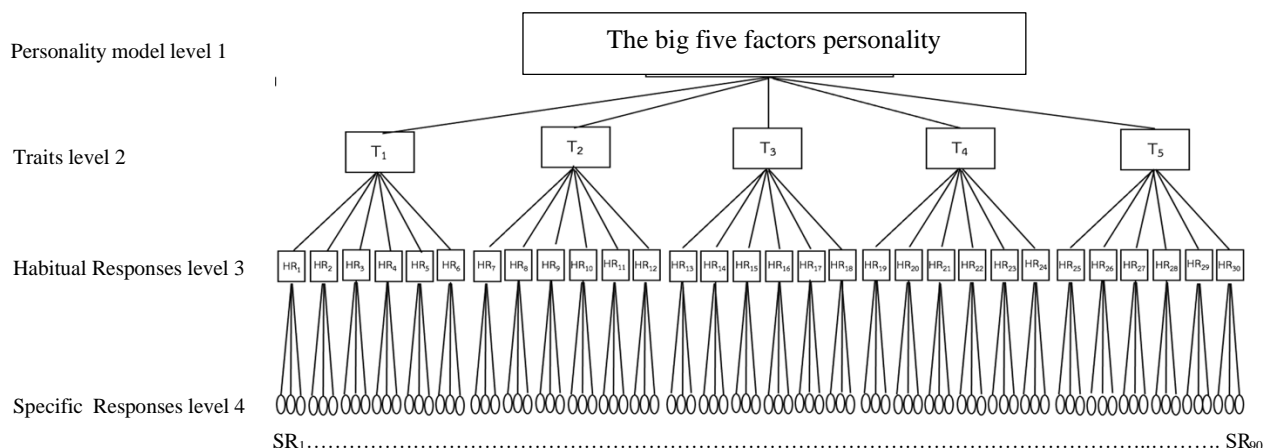


Fig.1 Research Conceptual Framework

Research Results

1. Synthesizing behavioral indicators of the Big Five Factors Personality.

The collected qualitative data on Traits' characteristics found that Habitual Responses' behavioral indicators and opposite behavioral indicators were various characteristics but within a similar scope of Traits. The examples are shown as follows.

Table 1 Examples of behavioral indicators and opposite behavioral indicators of HRs.

T₁ Neuroticism; HR₁ Anxiety	
Behavioral indicators	Opposite behavioral indicators
fear, overthinking, being self-absorbed, repetitive thoughts, fast-talking, speaking without thinking, getting irritated, complaining, easily annoyed, being loud, pacing, being apprehensive, worrying, gripping hands, sweating, rapid breathing, being quiet, daydreaming, feeling sad, sitting aloof, feeling lonely, having a pale face, appearing embarrassed, avoiding interactions, not smiling, being hesitant to express oneself, being restless	smiling, cheerful, bright, good mood, at ease, cheerful, mindful, calm, enjoys solitude, talks to everyone, confident, expressive, normal breathing, relaxed, lively, self-assured, not talkative, not stressed, not easily irritated, not shouting, not boastful, not hurting others, not causing distress to others.

The behavioral indicators were analyzed and content related to Costa & McCrae's five factors theory of personality (1992) found that the Big Five Factors of Personality consisted of Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. There were 30 HRs and 90 Specific Responses (SRs). The details are shown as follows.

Table 2 Behavioral Indicators of Habitual Responses and Specific Responses

Traits	Habitual Responses(HRs)	Specific Responses(SRs)
T ₁ Neuroticism	HR ₁ Anxiety	SR ₁ Doubt, SR ₂ Scare, SR ₃ Sadden
	HR ₂ Angry hostility	SR ₄ Frantic, SR ₅ Mayhem, SR ₆ Aggressive
	HR ₃ Depression	SR ₇ Hate, SR ₈ Despond, SR ₉ Contempt itself
	HR ₄ Self-consciousness	SR ₁₀ Afraid, SR ₁₁ Unsure, SR ₁₂ Shy
	HR ₅ Impulsiveness	SR ₁₃ Mad, SR ₁₄ Hustle, SR ₁₅ Speak without thinking
	HR ₆ Vulnerability	SR ₁₆ Worry, SR ₁₇ Moody, SR ₁₈ Mentally weak
T ₂ Extraversion	HR ₇ Warmth	SR ₁₉ Understand others, SR ₂₀ Attentive, SR ₂₁ Care
	HR ₈ Gregariousness	SR ₂₂ Join others, SR ₂₃ Relationship, SR ₂₄ Social Activity
	HR ₉ Assertiveness	SR ₂₅ Dare to talk, SR ₂₆ Courage to do, SR ₂₇ Self Confidence
	HR ₁₀ Activity	SR ₂₈ Awake, SR ₂₉ Like activity, SR ₃₀ Cooperate
	HR ₁₁ Excitement seeking	SR ₃₁ Challenge, SR ₃₂ Excited, SR ₃₃ Enjoy
	HR ₁₂ Positive emotions	SR ₃₄ Good idea, SR ₃₅ Well done, SR ₃₆ Pep talk
T ₃ Openness to experience	HR ₁₃ Fantasy	SR ₃₇ Think exotic, SR ₃₈ Creativity, SR ₃₉ Dream
	HR ₁₄ Aesthetics	SR ₄₀ Like Art and acting, SR ₄₁ Like beauty, SR ₄₂ Good natured
	HR ₁₅ Feelings	SR ₄₃ Emotion, SR ₄₄ Feelings, SR ₄₅ Sensation
	HR ₁₆ Actions	SR ₄₆ Volunteer, SR ₄₇ Real action, SR ₄₈ Do something new
	HR ₁₇ Ideas	SR ₄₉ Know, SR ₅₀ Think rationally, SR ₅₁ Think
	HR ₁₈ Values	SR ₅₂ Accept new things, SR ₅₃ Learned quickly, SR ₅₄ Do like most people
T ₄ Agreeableness	HR ₁₉ Trust	SR ₅₅ Trust the words of others, SR ₅₆ Believes the ability of others, SR ₅₇ Think others are honest
	HR ₂₀ Straightforwardness	SR ₅₈ Speaking bluntly, SR ₅₉ Honest, SR ₆₀ Do not cheat
	HR ₂₁ Altruism	SR ₆₁ Help others, SR ₆₂ Share, SR ₆₃ Kindness
	HR ₂₂ Compliance	SR ₆₄ Credulous, SR ₆₅ Agreed, SR ₆₆ Follow others
	HR ₂₃ Modesty	SR ₆₇ Good manners, SR ₆₈ Polite, SR ₆₉ Speak politely
	HR ₂₄ Tender-mindedness	SR ₇₀ Gracious, SR ₇₁ Generous, SR ₇₂ Compassion
T ₅ Conscientiousness	HR ₂₅ Competence	SR ₇₃ Working, SR ₇₄ Works well, SR ₇₅ Multi-tasking
	HR ₂₆ Order	SR ₇₆ Follow the pattern, SR ₇₇ Keep, SR ₇₈ Arrange
	HR ₂₇ Dutifulness	SR ₇₉ Dutiful, SR ₈₀ Principle, SR ₈₁ Work completed
	HR ₂₈ Self-discipline	SR ₈₂ Know duties, SR ₈₃ Compliance, SR ₈₄ Punctual
	HR ₂₉ Achievement striving	SR ₈₅ Goal, SR ₈₆ Persevering, SR ₈₇ Attempt
	HR ₃₀ Deliberation	SR ₈₈ Cogitate, SR ₈₉ Prepare, SR ₉₀ Prevent errors

The theories, concepts, and meanings of each Habitual Responses were analyzed and found that the definitions and situations that caused Habitual Responses were aligned with the concepts proposed by several experts who had provided meaning for each Habitual Response. Additionally, the behavioral indicators levels for each Habitual Response were developed based on Allport's trait theory (1955) of categorizing personality into three levels. The examples are shown as follows.

Table 3 Example of definition, behavioral indicators levels, situations that cause of HRs.

T₁ Neuroticism; HR₁ Anxiety		
Definition	Behavioral indicators levels	Situations that cause
Definition: A feeling of uneasiness, apprehension, uncertainty about future conditions, fear of danger or damage, Because something is expected to threaten a person's security, at the same time there will be physical discomfort, if there is a lot of anxiety or a long period. It can hurt a person's health. (Stuart & Sundra, 1995)	<p>Level 1 Recognize symptoms of illness, understand the causes and consequences of problems, accept loss, and accept changed relationships quickly.</p> <p>Level 2 Quickly seek ways to alleviate illness, seek ways to reduce problems, gradually come to terms with the loss, and accept changed relationships.</p> <p>Level 3 Obsessed with thoughts that the illness will become severe enough to cause one's death, the problem results in impairment of one's ability to perform one's duties, does not accept reality, thinks that there will be no loss, thinks that the relationship is still the same.</p>	<p>Situation 1 Threats to self-system from within oneself, such as illness, and physical exhaustion.</p> <p>Situation 2 Threats to the self-system from the outside that is society, including lack of necessities, changes in work status, social or ethical pressure, and changes in relationships between oneself and friends.</p> <p>Situation 3 Threats to self-system from outside the family. (Wallance, 1978)</p>

Table 4 Example of situations and behavioral indicators levels of SRs.

SRs	Situations and behavioral indicators level
SR ₁ Doubt	<p>Situation Threats to self-system from within oneself</p> <p>Level 1 Recognize symptoms of illness.</p> <p>Level 2 Hurry to find ways to alleviate illness.</p> <p>Level 3 Obsessed with thoughts that the illness would be so severe that it would cause one's own death.</p>
SR ₂ Scare	<p>Situation Threats to self-system from the outside that is society.</p> <p>Level 1 Self-control, good at problem-solving.</p> <p>Level 2 Have a little self-control.</p> <p>Level 3 Lack of self-control, narrow perception, fear of being punished.</p>
SR ₃ Sadden	<p>Situation Threats to self-system from outside the family.</p> <p>Level 1 Accept the loss, and accept the changed relationship quickly.</p> <p>Level 2 Gradually accept the loss, and accept the changed relationship.</p> <p>Level 3 Not accepting the reality, thinking that there will be no loss, thinking that the relationship is still the same.</p>

2. Creating and analyzing the quality of The Big Five Factors Personality tests: face validity, discrimination, reliability, and construct validity.

The creation the Big Five Factors Personality tests found that based on Costa & McCrae's five factors theory of personality (1992). There were two tests: one test for elementary school students and the other for secondary school students. There were short situational tests. The questions were about specific situations with descriptive texts and short stories related to themselves, their family, their school, and their surrounding society. The choices were developed based on Allport's trait theory (1955) of categorizing personality into three levels: inferior, moderate, and outstanding, respectively. The examples are shown as follows.

Table 5 Example of the Big Five Factors Personality tests.

The test for elementary students.	
T₂ Extraversion; HR₇ Warmth; SR₁₆ Understand others	
Situation	Arun said to student: "I forgot to bring my pencil to school again." What would the student say in response?
Choices and scores	A. You should buy a pencil at the school cooperative shop. - Score: 2 points. B. I lend you a pencil. - Score: 3 points. C. Forgetting has tended to be routing. - Score: 1 points
The test for secondary school students.	
T₃ Openness to experience; HR₁₆ Action; SR₄₂ Do something new	
Situation	Jane said to the student: "Teachers recruit student volunteers to donate things to help flood victims in the community." What would the student say in response?
Choices and scores	A. I would be very tired. I won't go. - Score: 1 points. B. I will go to help the flood victims. - Score: 3 points. C. Flood victims will probably feel better if we go to help them. - Score: 2 points.

They analyze the quality of the Big Five Factors Personality tests: face validity, discrimination, reliability, and construct validity.

2.1 Face validity by the opinions of five experts found that at least four out of five experts agreed indicating that 75 situational items (83.88%) were not improved, 15 situational items (16.67%) were improved before used, all passed 90 situational items (100%) for elementary school students test. For the secondary school students test; 73 situations (81.11%) were not improved, 17 situational items (18.89%) were improved before use, and all passed 90 situational items (100%) as shown in the table below as follows.

Table 6 Face validity of the Big Five Factors Personality tests.

Tests	Not improved	Improved before used	Passed*
elementary school students	75 (83.88%)	15 (16.67%)	90 (100%)
secondary school students	73 (81.11%)	17 (18.89%)	90 (100%)

*The consensus criteria was at least four out of five experts agreed.

2.2 Discrimination of the first discriminant analysis found that the discriminant range between .081 - .775 of 84 situational items for elementary school students and .081 - .770 of 85 situational items for secondary school students. All situations' r values were more than the critical r value in the table at .073 statistically significant at the .05 level of all situations. The second discriminant analysis found that the discriminant range between .082 - .497 of 83 situational items for elementary school students and .040 - .536 of 83 situational items for secondary school students. All situation items' r values were more than the critical r value in the table at .052 statistically significant at the .05 level. The test for elementary students found that 7 situational items were eliminated out of 90 situations, including SR₁ Doubt, SR₃ Sadden, SR₁₆ Worry, SR₃₉ Dream, SR₄₄ Feelings, SR₅₂ Accept new things, and SR₆₅ Agreed. The test for secondary school students found that 7 situational items were eliminated out of 90 situations, including SR₃ Sadden, SR₁₀ Afraid, SR₁₈ Mentally Weak, SR₃₉ Dream, SR₄₃ Emotion, SR₄₅ Sensation, and SR₅₂ Accept new things. The details are shown in table 7.

2.3 Reliability of the first reliability analysis found that there were Cronbach's alpha coefficients range between .668 - .831 of 84 situational for elementary school students and .632 - .899 of 85 situational items for secondary school students. The second reliability analysis found that there were alpha coefficients ranging between .666 - .821 of 83 s situational items for elementary school students and .672 - .806 of 83 situational items for secondary school students as follows.

Table 7 Discrimination and reliability of the Big Five Factors Personality tests.

Ts	Test for elementary students						Test for secondary school students					
	The first experiment			The second experiment			The first experiment			The second experiment		
	r*	r _{tt}	N	r**	r _{tt}	N	r***	r _{tt}	N	r****	r _{tt}	N
T ₁	.081-.462	.731	16	.098-.471	.732	15	.267-.770	.899	17	.062-.428	.672	15
T ₂	.510-.775	.751	18	.082-.489	.736	18	.151-.492	.736	18	.161-.536	.785	18
T ₃	.092-.453	.668	15	.085-.418	.666	15	.090-.336	.632	14	.121-.454	.701	14
T ₄	.125-.458	.704	17	.092-.446	.703	17	.081-.479	.698	18	.040-.494	.684	18
T ₅	.209-.531	.831	18	.185-.497	.821	18	.229-.524	.812	18	.254-.515	.806	18
Total	-	-	84	-	-	83	-	-	85	-	-	83

The r values more than the critical r value were considered had discriminatory power and statistical significant at the .05 level.; *The critical r value in the table at df = 508-2 = 506 is r = .073; ** The critical r value in the table at df = 2,062-2 = 2,060 is r = .052; *** The critical r value in the table at df = 514-2 = 512 is r = .073; ****The critical r value in the table at df = 2,009-2 = 2,007 is r = .052

2.4 Structural validation analysis found that the Big Five Factors Personality consisted of Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. The test for elementary school students had p-value of .059, .068, .055, .056, .061 more than .05; CFI of .995, .995, .991, .992, .996 more than .95; RMSEA of .012,

.010, .012, .011, .010 less than .05. The test for secondary school students had p-value of .056, .075, .072, .059, .079 more than .05; CFI of .993, .996, .994, .992, .996 more than .95; RMSEA of .012, .010, .012, .010, .010 less than .05. Upon analyzing the personality model diagram: Neuroticism model, Extraversion model, Openness to experience model, Agreeableness model, and Conscientiousness model; closely resembled the hypothesized model. The factor loadings for each item were statistically significant at the .01 level for all values. The details are shown as follows.

Table 8 Structural validation of the Big Five Factors Personality tests.

Traits	HRs	Test for elementary students				Test for secondary school students			
		FL	SE	t	R ²	FL	SE	t	R ²
Neuroticism	anxiety	.582	.020	29.711**	.338	.606	.150	4.030**	.368
	angry hostility	.823	.032	25.470**	.678	.885	.029	30.668**	.783
	depression	.850	.031	27.319**	.723	.903	.035	25.576**	.815
	self-consciousness	1.000	.000	-	1.000	.404	.130	3.101**	.163
	Impulsiveness	.924	.026	35.124**	.853	1.000	.000	-	1.000
	vulnerability	1.000	.000	-	1.000	1.000	.000	-	1.000
		$\chi^2=90.525$, df=71, p-value=.059, CFI=.995, RMSEA=.012				$\chi^2=89.80$, df=70, p-value=.056, CFI=.993, RMSEA=.012			
Extra-version	Warmth	.937	.026	36.362**	.879	.822	.043	19.072**	.675
	gregariousness	1.000	.000	-	1.000	.907	.031	29.308**	.823
	assertiveness	.830	.031	26.844**	.688	.564	.030	18.652**	.318
	activity	1.000	.000	-	1.000	.976	.032	30.773**	.952
	excitement seeking	.673	.038	17.741**	.453	.973	.033	29.532**	.946
	positive emotions	.747	.026	28.384**	.558	1.000	.000	-	1.000
		$\chi^2=128.416$, df=106, p-value=.068, CFI=.995, RMSEA=.010				$\chi^2=118.810$, df=98, p-value=.075, CFI=.996, RMSEA=.010			
Openness to experience	Fantasy	.642	.077	8.384**	.413	.650	.048	13.521**	.422
	aesthetics	.888	.039	22.965**	.789	.910	.034	26.469**	.828
	feelings	.836	.087	9.592**	.699	.278	.027	10.226**	.077
	actions	.807	.034	23.386**	.651	.848	.064	13.259**	.720
	ideas	.972	.046	21.129**	.944	1.000	.000	-	1.000
	values	.464	.079	5.880**	.215	.720	.041	17.638**	.518
		$\chi^2=88.774$, df=69, p-value=.055, CFI=.991, RMSEA=.012				$\chi^2=71.016$, df=55, p-value=.072, CFI=.994, RMSEA=.012			
Agreeableness	Trust	1.000	.000	-	1.000	.666	.055	12.124**	.443
	Straight forwardness	.681	.072	9.405**	.464	.097	.028	31.591**	.804
	altruism	1.000	.000	-	1.000	.945	.038	24.761**	.894
	compliance	1.000	.000	-	1.000	.843	.057	14.731**	.710
	modesty	.944	.035	26.632**	.892	1.000	.000	-	1.000
	tender-mindedness	.949	.080	11.840**	.900	.943	.038	24.892**	.890
		$\chi^2=120.126$, df=97, p-value=.056, CFI=.992, RMSEA=.011				$\chi^2=133.055$, df=109, p-value=.059, CFI=.992, RMSEA=.010			

Traits	HRs	Test for elementary students				Test for secondary school students			
		FL	SE	t	R ²	FL	SE	t	R ²
Conscientiousness	Competence	.931	.023	40.857**	.866	.847	.035	24.154**	.717
	order	1.000	.000	-	1.000	.935	.024	39.714**	.875
	dutifulness	.965	.022	43.410**	.931	.868	.038	23.073**	.754
	self-discipline	1.000	.000	-	1.000	1.000	.000	-	1.000
	achievement striving	.906	.026	34.243**	.821	.885	.035	25.304**	.783
	deliberation	.695	.036	19.576**	.483	1.000	.000	-	1.000
		$\chi^2=125.009$, df=102, p-value=.061, CFI=.996, RMSEA=.010				$\chi^2=112.913$, df=93, p-value=.079, CFI=.996, RMSEA=.010			

3. Creating local norms for the Big Five Factors Personality tests. It was found that the Stanine score was a standardized score ranging from 1 to 9 with the following criteria: Stanine score range of 1-3 indicated inferior level, 4-6 indicated moderate level and 7-9 indicated outstanding level of the personality trait. For example, in the Big Five Factors Personality test for elementary school students on Neuroticism personality Traits, Stanine score ranged from 1-3 corresponding to a raw score range of 15-18 indicating an inferior level, 4-6 corresponded to a raw score range of 19-25 indicated moderate level and 7-9 corresponded to a raw score range of 26-45 indicated outstanding as shown below.

Table 9 the local norms for the Big Five Factors Personality tests.

Test for elementary school students (83 items)			Test for secondary school students (83 items)		
Traits	Scores	Means	Traits	Scores	Means
Neuroticism (15 items, 45 full scores)	15 - 18	Inferior	Neuroticism (15 items, 45 full scores)	15 - 20	Inferior
	19 - 25	moderate		21 - 25	moderate
	26 - 45	outstanding		26 - 45	outstanding
Extraversion (18 items, 54 full scores)	18 - 39	Inferior	Extraversion (18 items, 54 full scores)	18 - 40	Inferior
	40 - 48	moderate		41 - 49	moderate
	49 - 54	outstanding		50 - 54	outstanding
Openness to experience (15 items, 45 full scores)	15 - 31	Inferior	Openness to experience (14 items, 42 full scores)	14 - 30	Inferior
	32 - 37	moderate		31 - 36	moderate
	38 - 45	outstanding		37 - 42	outstanding
Agreeableness (17 items, 51 full scores)	17 - 35	Inferior	Agreeableness (18 items, 54 full scores)	18 - 38	Inferior
	36 - 42	moderate		39 - 44	moderate
	43 - 51	outstanding		45 - 54	outstanding
Conscientiousness (18 items, 54 full scores)	18 - 37	Inferior	Conscientiousness (18 items, 54 full scores)	18 - 40	Inferior
	38 - 49	moderate		41 - 49	moderate
	50 - 54	outstanding		50 - 54	outstanding

Discussions

1. Synthesizing behavioral indicators of the Big Five Factors Personality. The behavioral indicators of the five factors personality according to the concepts of Costa & McCrae (1992) consisted of Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. There were 30 Habitual Responses and 90 Specific Responses. These could be formulated into a theoretical model for the personality of elementary school students and secondary school students. The model was consistent with Eysenck's personality theory (1969) and Guilford's personality theory (1959). Personality was structured into different levels. The specific response level was the lowest or the fourth level, involving behaviors in response to 90 different experiences or situations in everyday life. These behaviors were observable and characteristic of a person and constituted the SR. The third level was the HR, derived from specific behavioral expressions which comprised 90 Traits' behavioral indicators. These Traits tended to recur under similar or repeated daily circumstances, resulting in consistent reactions from the individual. The second level was the trait level, organized from the 30 Habitual Responses, which acted as group factors: Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. The personality level was the highest or the first level. In addition, the collected qualitative data with the samples were elementary school students and secondary school students in the Northern region of Thailand. The samples' behaviors were similar, in other words, the Traits' characteristics were not different. The findings are consistent with the research of Costa & McCrae (2000) comparative study of the development of five personality factors' Characteristics for each age group of people of different nationalities and cultures were found that the five personality factors at different ages were different. However, the five personality factors did not differ among people of different nationalities and cultures. Therefore, all behavioral indicators were suitable for elementary and secondary school students in Thailand.

2. Creating and analyzing the quality of The Big Five Factors Personality tests: face validity, discrimination, reliability, and construct validity.

2.1 Face validity based on the opinion of at least four out of five experts agreed indicates that the Big Five Factors Personality tests for elementary school students and secondary school students were valid. The tests were in line with the behavioral indicators and each choice corresponds to the level of behavioral indicators. In other words, they could comprehensively measure the content and align it with the intended behavioral indicators and levels of behavioral indicators. They were suitable for use with elementary school students and secondary school students. The tests comprised two parts: part one was 90 situations that align with the five factors' behavioral indicators, and part two was three choices corresponded to specified levels of behavioral indicators. Demonstrating that the Big Five Factors Personality test had face validity. The qualitative data collected using open-ended questionnaires were large enough that was deemed sufficient for capturing the indicating behaviors and opposite behaviors for all 30 HRs and for analyzing the content to derive 90 behavioral indicators. The analysis explained the meaning of each behavioral indicators, the level of behavioral indicator, and the circumstances that triggered the behavioral indicators. These findings were consistent with the ideas of many experts. For example: anxiety aligned with the ideas of Stuart & Sundeen (1995) and Wallace (1978), angry hostility aligned with the ideas of Fabes & Eisenberg (1992), depression aligned with the ideas of Dessler (1988) and Leiter & Maslach (1996), vulnerability aligned with the ideas of Lazarus & Folkman (1984) and Wallace (1978), warmth aligned with the ideas of Donald (1985), assertiveness aligned with the ideas of Bower

& Bower (1976), excitement seeking aligned with the ideas of Zuckerman (1979), positive emotions aligned with the ideas of Fredrickson (2007), fantasy aligned with the ideas of Toman (1976), values aligned with the ideas of Woodruff (1952) and Phenix (1958), trust aligned with the ideas of Robbins (2000), compliance aligned with the ideas of Belkin & Skydell (1979), Jones (1979), and Hallander (1978), competence aligned with the ideas of McClelland (1973) and Boyatzis (1982), and others. Therefore, the Big Five Factors Personality tests were face valid.

2.2 Discriminant of the last experiment was 83 situations for elementary school students and 83 situations for secondary school students at a statistically significant level of .05 showing that the situations could discriminate students for personality in each of five factors with different behavioral levels. The short situations tests comprised the questions were specific situations with descriptive texts and short stories. The students contemplated various situations related to themselves, their family, their school, and their surrounding society. The students had specific characteristics that were structurally related to each other including behaviors, emotions, motivation, thoughts, attitudes, values, intelligence, abilities, and self-concept. These were consistent with the idea of Good (1973, p. 417) who defines personality as the sum of behavior and all experiences of a person. Morris (1979, p. 618) stated that personality refers to the structure of various characteristics of a person regarding behavior, emotions, motivation, thoughts, and attitudes. In addition, Pervin & John (1991, p. 4) say that personality refers to the various characteristics of a person that are stable in terms of feelings, thoughts, and behavior. Therefore, the Big Five Factors Personality tests were 83 various situations for elementary school students and 83 various situations for secondary school students including three choices' level could discriminate students for five factors personality with different behavioral levels of groups: inferior, moderate, and outstanding.

2.3 Reliability of the last experiment was Cronbach's alpha coefficients range between .666 and .821 of 83 situations for elementary school students and .672 - .806 of 83 situations for secondary; statistically significant at the .05 level. The Cronbach's alpha coefficients were high values and nearing 1.00 indicating that the Big Five Factors Personality tests demonstrated reliable quality. The tests were analyzed twice for reliability by calculating Cronbach's alpha coefficient. Situations with Cronbach's alpha coefficients of .60 or higher were chosen to be consistent with 'the rules of thumb' proposed by Clark and Watson (1995) that Cronbach's alpha coefficient values of .60 or higher ensure that both the Big Five Factors Personality tests maintain reliable quality. The students have relatively stable individual characteristics. The student's personality was the result of behaviors that had developed and accumulated from the past until the present. It integrated with environments of home, school and community to become a permanent characteristics of the specific personality displayed by the student. These are consistent with Allport's (1961, p. 28) idea which states that personality is a type of structure that changes as a dynamic system within the body and mind of the individual. Personality determines a person's specific behavioral and thinking characteristics. Gordon (1963, p. 14) who stated that personality refers to the sum of all behaviors that are characteristic of an individual. Furnham (1992, p. 15) defines personality as a relatively stable pattern in social behavior. It reflects the structure and processes within a person. Therefore, the Big Five Factors Personality tests were 83 situations for elementary school students and 83 situations for secondary school students were reliable quality.

2.4 Structural validation analysis found that both tests for elementary school students and secondary school students had a p-value more than .05; CFI more than .95; RMSEA less than .05. These values of both tests indicated that the Neuroticism model and extraversion model, Openness to experience model, Agreeableness model, and Conscientiousness model were consistent with empirical data. This alignment with empirical data adhered to the idea of Hu and Bentler's (1999) recommendations for determining model fit, where a CFI greater than .95 is considered appropriate and currently accepted. MacCallum, Browne & Sugawara (1996) suggested that a RMSEA value ranging between .05 - .01 was suitable. The personality was the result of a complex interaction of structures and processes within an individual from experiences in the past. Each student shows different behaviors both overt and hidden behaviors within themselves. Students use personality to adapt to their environment. The personality can be used to describe a student's behavioral tendencies. There are consistent with idea of Cattell (1977, pp. 2-3) that personality refers to something that helps predict what a person will do in a given situation. Personality is a matter of a person's behavior both overt and hidden behaviors within themselves. McShane & Gilnow (2003, p. 84) that personality refers to a relatively stable pattern of behavior and emotional state. It is used to describe the behavioral tendencies of a person. Additionally, analyzing the personality model diagram, all five factors closely resembled the hypothesized model. The weight of each factor for every item was statistically significant at the .01 level, affirming construct validity. Each test comprised 83 situational items which could be used to measure the Big Five Factors Personality factors per Costa and McCrae's (1992) framework.

3. Creating local norms for the Big Five Factors Personality tests. Stanine score was a standardized score ranging from 1 to 9 Stanine score transformed from raw scores which are normally distributed. The translations of individual scores are meaningful and comparable. The Stanine score range of 1-3 indicated inferior level, 4-6 indicated moderate level, and 7-9 indicated outstanding level of the personality trait. This is consistent with the theory of Allport (1955) who says that a person's personality is relatively unified and stable. Whatever the personality is, it tends to stay that way and results in the person's appearance in various situations. A person's personality is determined by Trait which is a characteristic or habit. There are many different types of trends and there is no fixed trend. Each person will display any trait that stands out, depending on the physical environment and social pressures at that time. In addition, Allport (1955) classified three types of people's traits: Cardinal Traits are outstanding in a person and have a profound influence. It affects almost every aspect of a person's behavior. It is a personal characteristic that is clearly expressed and cannot be hidden. Central Traits exist within a person to a greater or lesser level. A person has common characteristics with others which can be observed in everyday life. Secondary Traits are not very prominent within a person. It is a person's attitude in response to various situations. Therefore, the Big Five Factors Personality tests were three choice levels indicated inferior, moderate, and outstanding level.

Knowledge from Research

The Big Five Factors Personality consist of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. For each test for elementary and secondary school students; there were 30 Habitual Responses (HRs) and 83 Specific Responses(SRs) aligned with 83 situational items. The quality of the tests were ensured through face validity, discrimination, reliability, and construct validity. 'The Big Five Factors Model of Personality' is shown as follows.

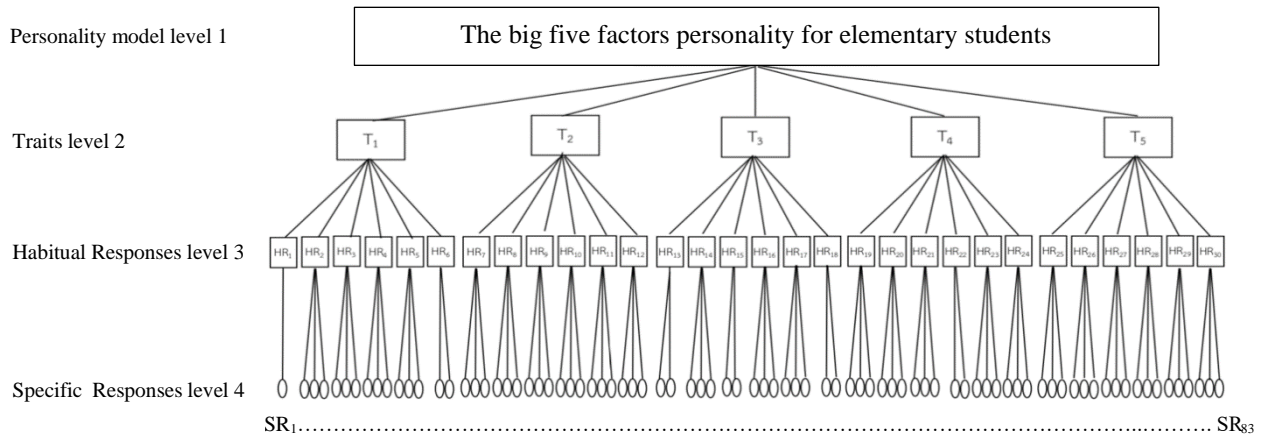


Fig. 2 The Big Five Factors Model of Personality for elementary school students

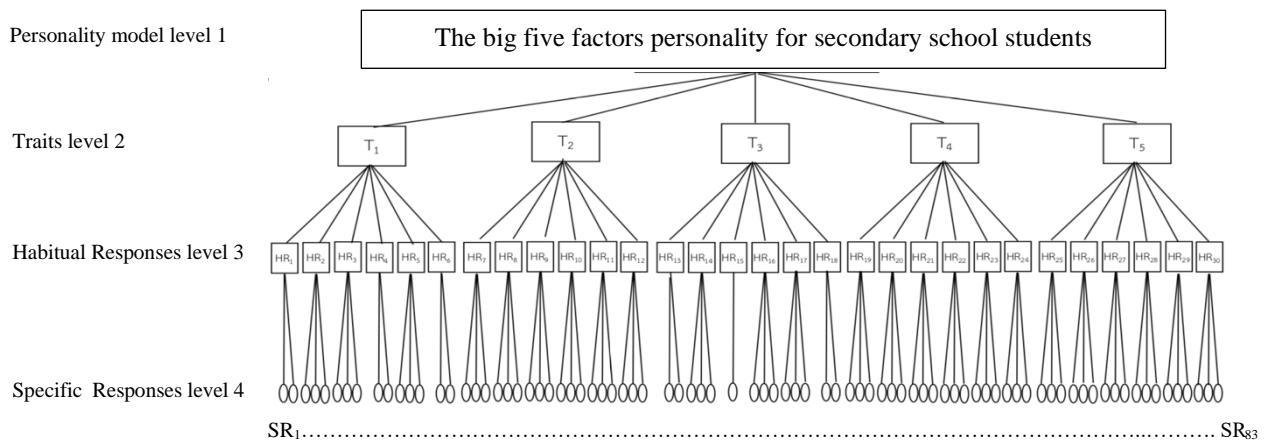


Fig. 3 The Big Five Factors Model of Personality for secondary school students

Conclusion and Suggestions

The Big Five Factors Personality tests consist of short of situations, totaling 83 situations. These have been further divided into five sub-tests. The selection of the appropriate format of the Big Five Factors Personality test for measuring students should consider the unique characteristics of the students. For instance, students who struggle with fluent reading, those who face challenges in learning, and students with learning disabilities (LD) should use the five sub-test format. This format encourages students to focus and engage with each question in every situation, minimizing guesswork and fatigue during the assessment. The score summaries and interpretations should be categorized for each of the Big Five Factors Personality tests. This separation is essential to clearly understand whether a student exhibits each of the Big Five Factors Personality at an outstanding, moderate, or inferior level. This information is valuable for promoting desirable personality Traits or managing undesirable

ones according to these Big Five Factors Personality. The examination operator should carefully review the user manual before conducting the test to understand the definitions of the Big Five Factors Personality and testing guidelines accurately.

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