The Development of the Resilience Questionnaire for Elementary School Students: A Confirmatory Factor Analysis

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Abstract

The purpose of the study was to develop the Resilience Questionnaire for elementary school students by using confirmatory factor analysis. The participants were selected by multi stage cluster random sampling. The participants were 311 elementary school students aged between 9-11 years and were studying grade 4-6. Factor analytic findings supported a five-factor model of resilience, which consisted of perceived self-efficacy, tolerance to negative feelings and stress, acceptance of changes in life, secure relationship in family and secure relationship with someone other than a family member (χ^2 = 966.88, $\chi^2_{/df}$ = 1.66, CFI = 0.901, RMSEA = 0.04, SRMR = 0.05). This five-factor model of resilience was consistent with the approaches for measuring resilience of Connor and Davidson (2003) and Sun and Stewart (2007). In addition, the results also demonstrated good internal reliabilities of the 5 subscales (Cronbach's α from 0.728 - 0.855). In conclusion, the Resilience Questionnaire showed to have promise as psychometrically sound questionnaire, which can be used to evaluate resilience level in elementary school students.

Keywords: resilience, elementary school students, confirmatory factor analysis

Introduction

Nowadays, the studies and researches in psychology have increased their focuses on the attributions of people with "Resilience" which focus on the study of applied researches to promote resilience (Friedli & World Health Organization, 2009). Resilience is an attribution of people that involves mental health, well-being, and quality of life when they face an unexpected adverse situation in life. This attribute helps people along their life span to adapt themselves properly and not to develop mental disorders when they are in the unfortunate situations of life. Masten, Best, and Garmezy (1990) explained that resilience is a process that associated with the ability of children to adapt properly even though they used to face negative life events or situations that threaten their normal lives. Resilience acts as a protective shield that lessens the negative influences from those adverse life events and helps people to adapt appropriately after facing such situations.

The fundamental concept of the study about childhood resilience believes that every child who can develop resilience after facing an adverse situation in life will be able to cope with the problems and challenging situations in life more effectively than the one who cannot develop resilience. A resilient child can properly deal with various stresses and pressures as well as to adapt well if he has to experience adverse and severe traumatic events. In addition, resilient children will be able to set goals that are clear and realistic, can solve problems that occur in life, have a good relationship with the people around them, including know how to respect themselves and others. The aforementioned characteristics have shown that resilience can prevent children from having problems in various areas and also help them to deal with everyday stresses that generally occur (Goldstein & Brooks, 2000). This is the reason that the study of resilience has continued to increase, especially among children and youths, to help develop the resilience that helps protecting children from the negative consequences of the adverse situations.

However, the study of resilience in children and youths is still limited because resilience is related to many concepts that involve the successful adaptation of a person when experiences adverse situation. Moreover, the definition of resilience in each research differs from each other and also related to cultural differences when studying resilience in the different cultures (Masten, 1999; Masten & Obradovic, 2006; Goldstein & Brooks, 2000). These limitations also affected the development of resilience measurements, which were studied and developed in various forms of measurement that consist of many elements in the context of the individuals, groups or countries. One example was the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003), developed by Connor and Davidson, which was utilized to evaluate resilience from five factors, while Sun & Stewart (2007) developed The Student Survey that measured resilience with twelve factors. In Thailand, the department of mental health had developed a resilience scale called Resilience Quotient Scale that was used in people age 25 years and over. Resilience Quotient scale consisted of three factors; emotional stability, hope, and encouragement, and overcome obstacles. Even though there were some resilience scales developed in Thailand, they were intended to be used with adolescents (Takviriyanun, *2008;* Lalitpasan and Yotongyos, 2012; Lhimsoonthon, 2000*)*. There is still no resilience measurement developed particularly for elementary school students which is a group that is gaining more interests from the researchers studying resilience. As a result, the

lack of resilience measurement for elementary school students means there is no tool to evaluate the effectiveness of the programs used to strengthen the protective factors associated with children's resilience as well as to identify the protective factors associated with resilience that should occur when children faced the adverse situations that affected their development, either regression and delay.

In this research, the researchers aimed to develop the resilience questionnaire particularly for elementary school students age between 9-11 years because the adoption of the adult version of the resilience questionnaire would be inappropriate to be used in children in terms of the language level used in the questionnaire, developmental and experiential differences between adults and children. In addition, during the age of 9-11 years, or late childhood is marked as the age in which their developmental changes occur simultaneously; emotional, mental and physical ones; that may result in emotional and social problems. In particular, if, at this age, children have to face with the adverse situation in life, they tend to have more serious problems and even bring about the worse consequences if the children do not have resilience. Supposing that the level of resilience in each child can be determined, the appropriate promotion of the resilient attribute can be provided.

Therefore, the development of the resilience questionnaire for children aged between 9-11 years is especially important and necessary for measuring the level of resilience of children as a tool to identify the level of resilience of children. The information gained can be used to find and promote the resilient attribute for children. The objective of this research was to develop and measure the quality of the resilience questionnaire for elementary school students with confirmatory factor analysis (CFA), a standardized method for developing resilience questionnaire that would enable the suitable questionnaire for the context of elementary school students in Thailand. This resilience questionnaire would be the tool that can provide important information as a starting point for the promotion and development of the resilience for elementary school students according to the factors of resilience derived from the resilience questionnaire development in this research.

The Development of the Resilience Questionnaire

The literature review concerning researches about resilience among children and youth revealed that each research in the past measured resilience differently according to their definitions of the resilience. The lack of universal definition of resilience had resulted in the problems of resilience measurement along with the complications about the classification of factors that led to resilience. In addition, there was still no standard resilience questionnaire for measuring resilience up to date (Luthar, Cicchetti, & Becker, 2000; Masten & Obradovic, 2006).

As for this research, the researcher defined resilience from the reviews of literature and theoretical concepts related to the resilience which concluded that resilience referred to the characteristics both the dynamic process and the trait of each individual. Resilience in children was the characteristic that helps them to reach and adapt according to their developmental milestone even after facing adverse life events.

Masten (1999) specified that resilience was the clearly structured characteristics composed of two most important factors which were adversity life

experiences, the events that threaten and obstruct the course of normal living resulted in the increasing risk of individual's problems in many aspects when facing with such events. The second factor was positive adaptation despite experiences with adverse events (Luthar & Zigler, 1991; Masten, Best, & Garmezy, 1990; Rutter, 1990; Werner & Smith, 1982, 1998). However, when considering resilience as a personal trait, resilience could be measured from the evaluation of the protective factor a person possesses as identified by Garmezy and colleagues.

Other than the differences of definition and meanings assigned to resilience, the limitation of resilience measurement also came from the measurement and evaluation approaches that researchers used to measure "appropriate adaptation" despite experiences adverse life events, as a measurement of resilience. The limitation in this matter comes from the differences in social and cultural expectations for appropriate adaptation at each developmental stage. For example, the academic achievement was considered in one society as the sign of appropriate adaptation of a child while another placed the appropriate adaptation to the hunting skills (Masten, 1999; Rutter, 1990; Luthar et al., 2000; Kumpfer, 1999). The aforementioned limitations encouraged the researchers to develop a questionnaire to evaluate resilience that would be suitable for the context of Thai society. The questionnaire development was based on the developmental psychology and resilience related concepts which would result in the developmentally appropriate and concept and theoretical based questionnaire.

From literature reviews both the theoretical concepts and the development of resilience questionnaires, the researchers had developed the factors for the resilience questionnaire according to Garmezy and colleagues (1984) which stated that resilience consisted of two major factors, the personal characteristics (internal factors) and the relationship with the family (external factors). The researchers also adopted the ideas of resilience questionnaire development from Conner and Davidson (2003) and Sun and Steward (2007)'s approaches of resilience measurement, details as follows:

1)   **Connor-Davidson Resilience Scale (CD-RISC)**. This individual resilience questionnaire was developed by Conner and Davidson (2003) after Richardson and colleagues (1990)'s approach along with Kobasa (1979, cited in Connor & Davidson, 2003)'s concept of hardiness. Conner and Davidson (2003) had studied the characteristics of a person with resilience to develop resilience questionnaire and implemented the questionnaire with five groups of samples namely, general individuals, general out-patients, psychiatric out-patients, patients with anxiety disorders and PTSD patients. The questionnaire consisted of five factors namely, 1 the notion of personal competence, high standards, and tenacity; 2 corresponds to trust in one's instincts, tolerance of negative affect and strengthening effects of stress; 3 the positive acceptance of change and secure relationships; 4 perceived control; 5 spiritual beliefs influences.

2)   **The Resilience Questionnaire (The Student Survey)** was developed by Sun and Stewart (2007) to evaluate children's level of resilience from the perception of their own characteristics including their own perception of external supports from their families, friends, schools, and community. The participants used in Sun and Steward's questionnaire were 2,794 children in their late childhood

consisted of primary school students grade 3 (average of 8.09 years old) and 5 (average of 10.05 years old), and the secondary school students grade 7 (average of 12.02 years old). The analysis showed that the Resilience Questionnaire (The Student Survey) showed validity in measuring the children's perception of their level of resilience. The researchers developed the factors using both exploratory and confirmatory factor analysis. The result showed that the questionnaire consisted of 12 factors, from 36 items, namely; family connection, school connection, community connection, participation in home and school life, participation in community life, peer relationship, peer support, communication, self-esteem, problem solving, empathy, and goals and aspirations.

However, both questionnaires had their limitations when measuring resilience. The Connor-Davidson Resilience Scale (CD-RISC) had specifically focused on personal characteristics as it appeared in the five factors of Connor-Davidson Resilience Scale that the secure relationship was only a part of the third factor in the scale while all other factors were related to personal characteristics and self-perception. Sun and Stewart (2007)'s scale also mainly focus on connection with family and others, and social support as evident from the fact that of all 12 factors of the scale, only five factors measured personal characteristics (problem solving, self-esteem, communication, empathy, goals and aspirations) and the all other seven factors measured relationship with the family and others. The researchers combined the distinctive features of both scales to develop the resilience measurement scale in this research. The new items in the questionnaire were also developed to accommodate the elementary school students in Thai cultural contexts. The researchers categorized the measurement of resilience in this research into 5 factors as shown in the conceptual framework in the next section.

The conceptual framework for the development of resilience questionnaire

From the literature reviews the researcher had employed Garmezy and colleagues (1984)'s conceptual framework for the development of resilience questionnaire for the elementary school students which stated that resilience consisted of two major factors, the personal characteristics (internal factors) and the relationship with the family and others (external factors), including Connor and Davidson (2003) and Sun and Stewart (2007)'s measurement concepts, therefore, the variables appeared in the conceptual framework of resilience questionnaire were consisted of 5 factors which defined as:

1. Perceived self-efficacy was defined as the person's positive perception toward their own competency which was the characteristics of the person who could develop resilience after facing negative life events.
2. Tolerance to negative feelings and stresses was defined as the ability to withstand negative feelings and pressures occurred from facing negative life events that had caused stresses, by being able to accept the negative feelings and the stress.
3. Acceptance of changes in life was defined as the ability to accept chances, as a result of negative life events, and continue with their normal livings even at the present of the negative life events.

The factors number 1 to 3 were internal factors which is the unique personal characteristics that facilitate appropriate adaptation and returning to normal living after facing the adverse life events.

4. Secure relationship in family was defined as good relationships with the family members they feel intimate with which makes them able to retain such relationship appropriately.

5. Secure relationship with someone other than a family member was defined as good relationships with other individuals other than the family members who were the teachers and peers

Factors number 4 and 5 were the external factors concerning the institutions that related to the person's way of life namely, family, intimate individuals and the community that the person belongs to. Positive relationship between the person and these institutions helped facilitate the person to be adaptive and able to return to their normal lives after experiencing adverse life events.

In conclusion, the researchers employed the aforementioned conceptual framework to develop resilience questionnaire for elementary school students as the factors of the questionnaire. The resilience questionnaire used in this research was the resilience questionnaire that consisted of 5 factors namely, perceived self-efficacy, tolerant to negative feelings and stress, acceptance of changes in life, secure relationship in family and secure relationship with someone other than a family member. The researchers created questionnaire items according to the definition of each factor. The scale were self-report with 5 level rating scale range from 0 (not at all true) to 4 (very much true).

Conclusions

The analysis of the data can be divided into two parts, the sample demographics and the confirmatory factor analysis. The researchers concluded as follows:

1. **Sample demographics**

The study included sample of 311 grade 4-6 elementary school students. Most of the participants within this research were grade 5 (41.2%), followed by grade 6 (31.5%), and grade 4 (27.3%). There were more male (53.7%) than female (46.3) samples, age between 9 – 12 years old. The average age of the sample was 10.4 years old.

2. **Confirmatory Factor Analysis**

The researcher performed the Confirmatory Factor Analysis on each factor of the resilience questionnaire namely, perceived self-efficacy, tolerant to negative feelings and stress, acceptance of changes in life, secure relationship in family and secure relationship with someone other than a family member. The results were as follows:

- **Perceived self-efficacy consisted of 12 items**. The result showed that the measurement model adjusted by the researchers was a good fit with the observed data which showed that it has construct validity (CFI = 0.93, RMSEA = 0.07, SRMR = 0.05).
- **Tolerant to negative feelings and stress consisted of 7 items.** The result showed that the measurement model adjusted by the researchers was a good fit with the observed data which showed that it has construct validity (CFI = 0.99, RMSEA = 0.01, SRMR = 0.03).
- **Acceptance of changes in life consisted of 5 items.** The result showed that the measurement model adjusted by the researchers was a good fit

with the observed data which showed that it has construct validity (CFI = 0.97, RMSEA = 0.05, SRMR = 0.03).

- **Secure relationship in family consisted of 6 items.** The result showed that the measurement model adjusted by the researchers was a good fit with the observed data which showed that it has construct validity (CFI = 0.98, RMSEA = 0.08, SRMR = 0.03).
- **Secure relationship with someone other than a family member consisted of 6 items.** The result showed that the measurement model adjusted by the researchers was a good fit with the observed data which showed that it has construct validity (CFI = 0.97, RMSEA = 0.06, SRMR = 0.04).

Confirmatory Factor Analysis of the resilience questionnaire

After performing the Confirmatory Factor Analysis of each factor of the resilience questionnaire which resulted in a total of 36 items, the researchers proceed with measuring the construct validity using second-order confirmatory factor analysis of the resilience questionnaire using 311 elementary school students in Chiang Mai province, Thailand as the samples. The analysis was done using IBM SPSS Amos software. The result showed that the measurement model adjusted by the researchers was a good fit with the observed data which showed that the questionnaire had construct validity (χ^2= 966.88 , $\chi^2_{/df}$= 1.66, CFI = 0.90, RMSEA = 0.04, SRMR = 0.05). The details of the analysis were as shown in table 1.

Table 1 Factor loadings of the second-order latent variables in the measurement model of the resilience questionnaire (N=311)

Latent Variable	Second-order latent variable	standardized factor loading (β)	(R^2)	Observed variable	standardized factor loading (β)	(R^2)
Resilience	Perceived self-efficacy	.879	.772	Per1	.629	.396
				Per2	.566	.320
				Per4	.599	.359
				Per5	.689	.475
				Per6	.672	.452
				Per7	.714	.510
				Per8	.569	.324
				Per9	.503	.253
				Per10	.532	.283
				Per12	.508	.258
				Per13	.704	.496
				Per14	.614	.377
	Tolerant to negative feelings and stress	.906	.821	Tol16	.463	.215
				Tol17	.432	.187
				Tol19	.617	.380
				Tol20	.556	.309

Latent Variable	Second-order latent variable	standardized factor loading (β)	(R^2)	Observed variable	standardized factor loading (β)	(R^2)
				Tol21	.654	.428
				Tol22	.606	.368
				Tol23	.605	.366
	Acceptance of changes in life	.960	.921	Acc24	.512	.262
				Acc25	.551	.304
				Acc27	.598	.357
				Acc28	.632	.400
				Acc29	.594	.353
	Secure relationship in family	.664	.441	Fam31	.547	.299
				Fam32	.851	.724
				Fam33	.794	.630
				Fam34	.636	.404
				Fam35	.595	.354
				Fam36	.763	.582
	Secure relationship with someone other than family member	.724	.524	Com38	.476	.226
				Com39	.524	.275
				Com40	.600	.360
				Com41	.547	.299
				Com42	.486	.236
				Com44	.504	.254

Figure 2 showed the measurement model of the resilience questionnaire. The analysis from table 1 had shown that all second order factors were significantly accountable for the variance of the resilience at .05 level. Since the former measurement model before an adjustment was not fit with the observed data (CFI = 0.86, RMSEA = 0.05, SRMR = 0.06), the researchers had analyzed the model by allowing correlations among the error terms within the same factor. Therefore, the adjusted measurement model of resilience was a good fit with the observed data, showing its construct validity (χ^2= 966.88 , $\chi^2_{/df}$= 1.66, CFI = 0.90, RMSEA = 0.04, SRMR = 0.05) as illustrated in figure 1.
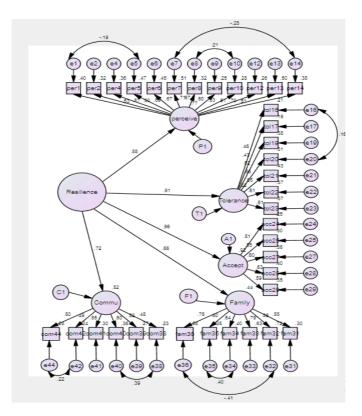
Figure 1. Measurement model of the resilience questionnaire (χ^2= 966.88 , $\chi^2_{/df}$= 1.66, CFI = 0.90, RMSEA = 0.04, SRMR = 0.05).

Discussion

Data analysis showed that the adjusted measurement model of the resilience questionnaire was a good fit with the observed data using CFI, RMSEA and SRMR indexes. It was found that the CFI index was higher than .900, while RMSEA and SRMR were lower than .080. Moreover, the measurement model was in accordance with the conceptual framework that the resilience questionnaire consisted of five factors, 36 items namely, perceived self-efficacy, tolerant to negative feelings and stress, acceptance of changes in life, secure relationship in family, and secure relationship with someone other than family member. When considered the standardized factor loadings of each item of the five factors, it was evident that each item's standardized loadings was within good criteria (35 items with higher than .40 loading and 1 item with .384 loading). This is complying with what Tabachnick & Fidell (2013) had indicated that the standardized item loading with more than .32 loading is considered an acceptable criteria. Therefore, the items within the resilience questionnaire were deemed representable of each factor. The standardized factors loading of the perceived self-efficacy were between .495 to .712 loadings. Tolerant to negative feelings and stress' standardized loading were between .446 to .628 loadings. Acceptances of changes in life's standardized loading were between .527 to .677 loadings. Secure relationships in family's standardized loading were between .496 to .837 loadings, while the secure relationships with someone other than family member's standardized loading were between .384 to .837 loadings. The investigation of the scale's reliability showed that the perceived self-efficacy scored high on the reliability criteria (> 0.80), while the other factors' score between 0.728 to 0.781 in

the reliability analysis which were considered appropriate (Allen & Yen, 2002). In addition, all factors were accounted for the variance of resilience.

The assessment of the validity and reliability of the resilience questionnaire for the elementary school students in this research were conducted within grade 4-6 elementary school students. The second-order confirmatory factor analysis showed that the measurement model of resilience developed by the researchers were in accord with Sun and Steward (2007)'s measurement concept of resilience. The resilience questionnaire developed within this research was able to measure both the personal characteristics; perceived self-efficacy, tolerant to negative feelings and stress, and acceptance of changes in life; and the external factors; secure relationship in family and secure relationship with someone other than family member. Therefore, this resilience questionnaire can measure level of resilience globally from the child's perception toward their own characteristics and their perceived external support.

The developed questionnaire also conformed with California Healthy Kids Questionnaire (California Department of Education, 2004) that structurally measured personal characteristics; communication, self-esteem and perceived self-efficacy, empathy, goal setting and problem solving skill. The questionnaire also stress on the children's surrounding environment which were supports from teachers, adult relatives, adult in community, and the peer group. The developed questionnaire also conformed with many other resilience questionnaires previously developed for adolescents and adults (Donnon, Hammond & Charles, 2003; Friborg et al, 2003; Ungar et al, 2008; Hjamdal et al, 2006). Furthermore, this resilience questionnaire also complied with Garmezy and colleagues (1984)'s concept of resilience measurement which indicated that resilience was composed of two principal factors; personal characteristics and relationship with family members and other someone while resilience is considered a mixture of factors between personal characteristics and personality, and the family environment and facilitating social support.

The resilience questionnaire that composed of the internal factors and external factors also consonance with Masten and Coatsworth (1998)'s characteristic of the children with resilience. It was found that children with resilience usually contain a better problem solving and data processing skills which helped them to protect themselves from the adverse events, control and alter their own behaviors, including trust their own ability so that the children can learn from the negative events. As for the external factor, it was found that children with resilience usually had positive relationship with their family and the children had at least one adult that they strongly bonded with. The person can be both primary caregivers (parents), and the others person that the children established good relationship with. This reflected that the resilience questionnaire developed in this research had reflected the characteristics of a person with resilience as what previously studied.

The result of this research had supported that the resilience questionnaire for elementary school students was valid and reliable. The developed resilience questionnaire consisted of both internal factors and external factors of each person which differed from the Connor-Davidson Resilience scale (CD-RISC) that mainly focused on measuring personal characteristics while Sun and Stewart (2007) emphasized mainly on relationship with the family and other someone, and social support. Therefore, this resilience questionnaire was more global when measuring

resilience, and more contextually appropriate to be applied within Thai cultural context. This questionnaire can be used to measure the level of resilience among children age 9 – 11 years old which would be beneficial for the researchers as they can utilized the results for the resilience intervention program for children. Children at this age should be promoted with positive psychological characteristics so that they could have the protective factors when facing unexpected life events and be adaptive despite such events.

The limitation of this research seemed to be the number of samples in the analysis of confirmatory factor analysis, however, Kline (2011) had broadly provided the least acceptable number of samples that the samples should not be lesser than 200 units. Therefore, the result of this confirmatory analysis is eligible for identifying the validity and reliability of the resilience questionnaire for the elementary school students. Furthermore, there were some limitations on data collection with the nine year old samples that some of the samples still had limited reading skills. Even though the researchers tried to solve this by reading aloud the questions for the samples, such reading limitation had resulted in many of the invalid data that could not be used in the analysis. The future research should consider the development of the abbreviate resilience questionnaire using shorter and more concise questions which would result in a more completed data for further analysis.

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