

Orphan Welfare in Myanmar: A Meta-analysis of Theories and Methods¹

Htar Htar Ei²
Daniel Schoc³
Prapatchon Jariyapon³

Abstract

The main objective of this study is to contribute Orphan Well-being Index (OWI) by using best fitted theories and applicable methods in the situation of Myanmar. The numbers of orphans have increased in Myanmar because of poverty and disaster. With this increasing number of orphans and poor children, the orphanages and institutions has been increased. Faith-based institutions were mainly running a number of orphanages within country. While faith-based institutions provide children food, shelter, clothes and educating. The well-being of these children under institutions are more and more important. When investigating the well-being of orphans, the data turned out to be unreliable. Therefore the methods and theories were modified to adapt to the situation of Myanmar.

Overall orphan well-being comprised of three domains of well-being, physical, emotional and educational. Physical well-being was made up of the indicators of nutritional status, accordance of accident, sickness, hunger, death rate and hospitalization. Due to the age unreliable problems of children in the real world situation, nutritional status was measured with MUAC, age independent anthropometric indicator which can

¹ This article is a partial fulfillment of Thesis in Master of Economics, Faculty of Economics, Chiang Mai University

² The author is Graduate student, respectively, Faculty of Economics, Chiang Mai University.

³ Professor of Faculty of Economics, Chiang Mai University.

be conducted easily in the field-based research and is reliable. Emotional well-being was made of the indicators of happiness at school, happiness at orphanages and relationship with peers. Educational well-being of children was measured with the indicators of scores in Myanmar reading, scores in Myanmar writing, scores on Mathematics and scores in Science. Finally, orphan well-being index was built as casual indicators models where indicators defined the domains of well-being. This orphan well-being index was built in order to investigate the differences of basic well-being of children by regions or types of orphanages in Myanmar.

01. Introduction

Myanmar practiced a mixed-economy till 1962 and adopted a centrally planned economy for 25 years. After 1988, market-oriented economic policy has been practiced. Since Myanmar is an agricultural country, economic policy is based on agriculture. In 1997, the Central Statistical Organization computed estimated poverty ratio rates based on findings of the Household Income and Expenditure Survey, 1997. According to the findings of that survey, the percentage of people living below a poverty line is 22.9 for the Union, 23.9 for urban and 22.4 for rural (Shein and Myint, 2001). But the most updated data about poverty is not available.

Most of the orphans are institutionalized mainly because of poverty. Furthermore, in 2008 May, the natural disaster, Cyclone Nargis hit the country and a lot of children had lost their parents. According to these reasons, the growing numbers of orphans within country has become vital issue to be considered. Orphans often came from Kachin State, Chin State, Shan State, Mon State, Yangon Division, the Delta divisions, and the central areas of Myanmar. Most of the orphans I studied came to the respective institutions from the southern part of Myanmar, especially Yangon Division and the Delta Division, and mainly due to poverty. The same situation of poverty could be found in the central parts of Myanmar.

In Myanmar, year on year and up to the time of my study, the number of orphans and orphanages in non-government institutions had increased, especially in faith-based orphanages, and so the well-being of those under the control and supervision of these institutions had become more and more important. Though each institution supported the children's food, shelter, clothes, education and basic health care services requirements, the development and level of well-being that each child experienced could be different depending upon the level of support and supervision that existed in the different types of institutions. Research questions or hypothesis of this study is as follow.

1. Why Myanmar needed to be study about well-being of orphans in these days?
2. Does Myanmar need separate theory of well-being of children?
3. Does Myanmar need separate methods of measuring well-being?
4. By building well-being index, what kinds of policy recommendations are expected to be contributed?

02. ■ Methods and Theoris

In order to investigate the underlying situation of the children and how the institutions were coping in the community, major cross-sectional surveys were conducted in Yangon (the capital city of Myanmar), Mandalay (the second largest city in Myanmar) and Taung Soon (located in Mon State). In Yangon Division, surveys were conducted in three church-based orphanages and two monastery-based orphanages out of a total of 45 orphanages. In Mandalay, surveys were conducted on one church-based orphanage and four monastery-based orphanages. In Mon State, surveys were conducted in two monastery-based orphanages out of a total of five. In Yangon and Mandalay, a total of 180 children per city acted as respondents, while in Taung Soon, 90 children were questioned.

The major findings of the surveys were as follows:

1. Almost all of the institutions had the same structures in terms of material well-being, because the institutions provided the same number of books and stationary; numbers which were not really sufficient.
2. Documentation and records regarding the children profiles, including their health history and birth certificates, were rarely stored or available.
3. The ages of the orphans were not reliable and accurate. The organizations themselves could not provide any birth certificates, nor exact birth dates. This was one of the problems that could be found in a developing country like Myanmar.
4. They had almost the same dietary intake structures in all the institutions, and the portions of food they obtained were difficult to measure.
5. No children had died from malnourishment.
6. The school enrolment percentage was very high, because almost all of the children within each institution were enrolled in monastic or government schools.

Based on finding in the real world situations, child well-being theories and methods were reviewed and gave the best applicable methods and theories were used in building Orphan Well-being Index (OWI).

2.1 Fundamental elements of child well-being

Since child well-being is a multi-dimensional concept, the approaches of both quantitative measurements and conceptualization differ, depending on the nature of the study and the research objectives. It is essential to understand the mechanism and underlying factors forming a child's well-being and their causes, and the interrelationships between the different components contributing to that well-being. According to UNESCO (Education Sector Monograph No 18/2001), the fundamental elements of child well-being refer to the basis of the strengths contributing to an individual's well-being in the physical, social, emotional and cognitive domains.

(a) Physical wellbeing

Having good nutrition, preventive healthcare, taking physical activities, having physical safety and security and substance abuse prevention and good reproductive health defines physical well-being (Rogers and Leavitt, in press).

Physical well-being is basically measured with many ways including evaluating dietary intake, assessing nutritional status, measuring physical activities with references to energy spent, accessing availability of healthcare and using self-report surveys about risk factors of physical safety such drug use, alcohol and sexual activity.

(b) Social and Emotional wellbeing

Social and emotion well-being is defined by emotion regulations, coping and autonomy skill, development of self, sympathy and empathy, and having good relationship with parents, family, sibling and peers (Halle and Zaff, in press).

Emotional well-being is formally measured with paper/pencil methods, surveys and naturalistic observation methods.

(c) Cognitive wellbeing

Cognitive skill includes remembering, perceiving, conceiving, judging in order to use knowledge (Bornestein and Smith, in press). Cognitive well-being is necessary for communicating one's thoughts, feelings, and wishes in order to obtain needs of that someone.

There are varieties of methods which measure cognitive well-being. They are paper/pencil methods, surveys, IQ tests, assessments of report cards and achievement tests.

2.2 Theoretical Considerations of construction indicators

It is vital to know the nature and direction of the relationship between indicators and their domains, in order to construct a specific model. Structural equation modeling distinguishes two measurement models: reflexive and formative (Edwards and Bagozzi, 2000). There are three theoretical considerations to be made in order to decide whether reflexive models or formative model should be used. These are: (1) the nature of the construct, (2) the direction of causality between the indicators and the latent construct, and (3) the characteristics of the indicators used to measure the construct.

Since the indicators of reflective models are formed by the underlying construct and have a positive inter-correlation, the various primary analyses used for checking the indicators inter-correlations are necessary. Whenever constructs are measured through questionnaire items, then administering the samples of the respondents, checking for the presence of outliers, checking the dimensionality of the construct by using factor models or principle component analysis, checking the correlation between indicators and constructs in order to decide the expected directionality and strength by using bi-variate correlations, carrying out factor or regression analysis, checking reliability with through the measure of factor loading and communality, and ensuring Cronbach alpha and internal consistency, are all necessary for the primary analysis (Trochim, 2006). The important empirical consideration is the measurement error in the reflective model. Summing the scale score of indicators to form a construct will result in inconsistent structural estimates, because it will ignore the effects of measurement error. Diamantopoulos (2006) stated that in the reflective model, all the error terms are associated with the observed scores of indicators.

Since the indicators in the formative models form the construct, and indicators are not required to have the same antecedents and consequences, indicator reliability cannot be assessed empirically (Churchill, 1979; Diamantopoulos and Siguaw, 2006). There are no simple, easy and universally accepted criteria for assessing the reliability of formative indicators. By using the sum-scale score in order to represent the construct of formative models, this may lead to biased estimates except in the event that all of the coefficients relating the measures to the construct are equal to one, and the construct level measurement error is zero (Javis, Mackenzie, and Podsakoff, 2003). The composite latent variable model includes an error term, which is represented at the structural level (domain) rather than the individual item level (indicators). In the causal indicator model, by designing the model out of the study before the data is collected, the researcher can overcome the measurement error. There are two possible ways to eliminate the error term through design: (1) to capture all possible causes on the construct, and (2) to specify the construct in such a way as to ensure the full set of indicators is captured (Diamantopoulos, 2006).

Table 1. Reflective Vs Formative indicator model

Theoretical considerations	Reflective Indicator (Effect Model)	Formative Indicator (Casual Indicator Model)
Nature of the construct	Independent of the measures used, and the latent construct exists in an absolute sense (Borsboom, Mellenbergh, and Heerden, 2004; Rossiter, 2002).	The construct is dependent upon the indicators. Changes in the indicators can cause changes in the underlying construct/domain.
Direction of causality	Causality flows from the construct to the indicators. Changes in a construct are assumed to cause changes in the indicators. This is called a reflective model by Fornell (1982).	Causality flows from indicators to the construct/domain. Variation in the construct does not cause a variation in the indicators (Bollen and Lennox, 1991).
Characteristics of indicators	Domain or construct influence the indicators. The validity of the construct/domain cannot be affected by inclusion or exclusion of one or more indicators from the domain.	Indicators have defined the construct. Adding or dropping an indicator may change the conceptual domain of the construct (Rossiter, 2002; Javis, Mackenzie, and Podsakoff, 2003).

03. ■ Building an Index

Orphan Well-being Index (OWI) was finally built through the steps of defining orphan's well-being, giving main approaches to build the index, selecting appropriate domains and indicators and providing measuring methods of indicators.

3.1 Dening an Orphan's Well-Being

Since Myanmar is one of the major countries where Theravada Buddhist tradition is predominant, the monks played in important role. One of the statements of Buddha's teachings on the role of monks towards the community says that the monk's duty is "Sangham saranam gaccami : To serve as a refuge in times of suffering."⁴ "In the case of operating orphanages, there are five main objectives that the monks implement, which are, to provide food and shelter, to educate, to provide a healthy environment, to provide mental strength for the child and to give warm living-kindness to the children. By fulfilling these objectives, Buddhist monks act as a refuge in times of suffering. Educating the children is not only aimed at the children's life development, but also as an alternative way to support the children in understanding the teachings of Buddha. On the other hand, the Christianity to child welfare was stated as "Religion that God our Father accepts as pure and faultless is this: to look after orphans and widows in their distress and to keep oneself from being polluted by the world."⁵ "In accordance with this saying, the Church-based institutions provide the vulnerable children food, shelter, formal and religious educations and warm loving-kindness.

⁴ *The Buddha's teachings on the roles of monks* which was coded from Maund and Matta, 2006, *A Buddhist Approach to HIV Prevention and AIDS Care*, p.33

⁵ *The Christianity to child welfare*. Coded from James 1:27, *Scripture taken from the HOLY BIBLE, NEW INTERNATIONAL VERSION®*. Copyright © 1973, 1978, 1984 International Bible Society. from <http://james127.com/>. Retrieved at 12.3.2009.

In the institutions, given that the main reason why the children visited them was due to poverty, 70 percent of the occupants were poor. Within this situation we need to define 'poor'. Even though these children were poor, they were not disease affected, which could be found in some African countries. 'Poor' meant poor in terms of the lack of education in their villages and poor enough not to be able to support them for schooling and for food. These children came from a remote part of Myanmar, where the transportation and education systems were not well-developed. Their parents could not earn enough money in their daily income to support their children fully, because they had to work in the fields cultivating and farming, or worked on plantations or in seasonal jobs. For the education of their children was the second key reason why the parents sent their children sent to the institutions located in the cities. In some villages there were only primary schools, or possibly a secondary school. Due to a lack of teachers or facilities, these schools were not able to provide for the children satisfactorily. As a result of these substantive reasons, the parents sent their children to the institutions. The institutions provided the children with shelter, food and education, and were not run for profit. The definition of the well-being of an orphan in Myanmar was not like it is in other situations. If the children were safe, healthy, and happy and could be educated by living in institutions, it was considered that these children's well-being had been improved, because living in the institutions was seen as somewhat better than their life living in their own villages, even though they were then apart from their parents and families.

3.2 The Main Approaches used to develop an Index

According to the definition of orphan well-being seen above, the main approach to measuring the well-being of orphans is to state the underlying situations of their well-being, based on an assumption of their basic needs in their respective orphanages. Since there have been three main approaches used to measure well-being, the data driven approach with applicable theories will be used in terms of the situation in Myanmar. The reason why we will use this data driven approach, is that according to the primary survey, it was found that:

1. *Records were rarely maintained in all of the institutions, and that*
2. *No primary survey had been conducted previously in this field.*

In this data driven approach, there had to be two criteria met in order to fulfill the data requirements, which were:

1. *The data had to be reliable, and*
2. *The data had to be able to cover the necessary conditions of the well-being of the orphans.*

3.3 Domain and Indicators

Many people and many countries have produced domains and indicators based on their own definitions of child well-being and their approaches to finding it. In the European Union well-being index for children (UNICEF 2007), the index was constructed using eight clusters: the material situation, housing, health, subjective well-being, education, children's relationships, civic participation, and risk and safety. In the 'local index of child well-being in England', material well-being, health, education, crime, housing, environment and children (at risk of being) in need, were used as the main domains (Bradshaw, Bloor, Huby, Rhodes, Sinclair, and Giobbs, 2009). Based on the objectives and approaches of the researcher, domains and indicators might differ.

In the case of Myanmar, the criteria used to select the domains and indicators differed, because the children covered in the study were orphans living in the institutions. Furthermore, the main objective of building the orphan well-being index was to aid the primary investigation of the well-being of the orphans, when a primary investigation in this field had never been conducted in the country as a whole.

Material well-being is generally one of the important indicators for measuring the well-being of children. However, in the Myanmar situation, material well-being could not be taken an account. Based on the primary survey, it was found that the institutions had almost the same material conditions as the owner's properties. Since these institutions were non-profit, they had no opportunity to earn regular income. Some Church-based institutions received a subsidy from the Christian Association, but it was not sufficient. The monastery-based institutions were mainly dependent on donation money, apart from some institutions which had income generation programs. In Myanmar, one of the methods used to distribute income from the rich to the poor was in the form of donations. Under this situation however, they could not provide for the children sufficiently. Material well-being did not vary much among the orphans under these conditions.

In European countries, crime and risks factors have been used as important dimensions of child well-being. In the case of Myanmar, these factors could not be taken into account for the following reasons. According to my primary survey, and from interviews held with the children and the heads of the organizations:

1. *Children who smoked cigarettes, drank alcohol and participated in physical fighting were not found in each of the institutions.*
2. *Sexual abuse cases were not found in each of the institutions.*
3. *Children who had ever committed crimes were not found in each of the institutions.*

This may have been because of the good management system of the religious institutions and the discipline that they instilled, or that the children were sufficiently poor not to commit risky behavior like drinking alcohol or smoking cigarettes.

Civic participation is defined as young people's participation in civic activities such as student councils, youth organizations, environmental organizations, human rights organizations or charities and the collection of money. In the situation of orphans however, it is difficult to measure these indicators, because such types of organization are not well developed. As a result, using an indicator covering civic participation was not relevant for use in the model here.

In accordance with the above, the well-being of orphans was measured using three dimensions, these being the physical, emotional and educational. In this case, the assumption of the model was to give the primary investigation of the well-being of the orphans with reference to definition of orphan's well-being itself, when primary investigation in this field has never been conducted country as a whole. Depending on the assumption of the model, any detailed consideration to these indicators had not given, and used only the most reliable indicators, indicators that covered the general well-being of the orphans in a situation such as that in Myanmar.

In the domain of physical well-being, children's nutritional status, their sickness, hunger, accident levels and death rate were measured as indicators. Emotional well-being was measured using indicators of a child's happiness in school, happiness in the orphan-ages, and their relationships with their peers. Educational well-being was measured using indicators of achievements in reading and writing, of mathematical skills and achievements in science. In this case, physical and educational well-being were measured objectively, and emotional well-being was measured subjectively and utilizing the observational skills of the researcher. These three dimensions and their indicators covered data reliability and basic needs criteria, which provided the assumption that orphans, should be healthy, happy, educated and be safe living in the respective institutions.

3.4 Measuring Indicators

To measure the indicators, we provided the most reliable and objective methods, because of the real world situation in which the evidence, records and information was insufficient.

(a) Physical Well-Being

The physical well-being measurement was made up of six indicators: nutritional status, hunger, the sickness occurring within one month, the number of children hospitalized within one year, the number of children who had an accident within one month and death rate with one year of the orphanage.

1. Nutritional Status

The nutritional status of the children was important in showing their state of physical well-being. In a UNICEF (2007) report, the percentage of children who were overweight was used as one of the health indicators to reflect the well-being of children. In the case of Myanmar, obesity was not an appropriate indicator to reflect the health status of a child, so we had to measure the level of malnourishment found amongst the children. However, the objective of measuring the malnourishment of orphans in this situation was quite different from the aim of the nutritional research that has been used in African countries, disease affected areas, or other less developed countries. Most nutrition research has been conducted to investigate mortality rates amongst children experiencing malnourishment. In the situation of the orphans living in institutions in Myanmar, there was no child who had died from malnourishment, according to the primary survey. This may have been because of the fact that these children were mostly above five years old. Malnourishment was a critical problem in younger age groups. Furthermore, there has been no nutrition survey conducted in the above five age group category of children in Myanmar as a whole. In this model therefore, malnourishment was used to investigate the health status of the children.

Three approaches to measuring nutritional status have been used previously; assessing the clinical signs of malnutrition, biochemical indicators and anthropometry. Biochemical and clinical indicators are useful only at the extremes of malnutrition, where body measurements are sensitive over the full spectrum (Go'mez, Tamos, and Cravioto 1952). Furthermore, biochemical measurement need laboratory facilities, costly equipment and highly qualified staff, in order to interpret the tests and the protocols for collecting,

storing and transporting specimens and for reporting results. In a field-based research situation, these requirements of the biochemical methods are unsuitable for investigating nutritional status. Clinical indicators are assessed through the investigation of physical signs and the symptoms of malnutrition, by highly qualified clinical staff. In the clinical assessment, slow growth and development are examined by comparing an individual or a group with normal values on growth charts, such as the pallor of the skin, mucous membranes of the mouth and eyes, nail beds or palm surfaces, and changes in hair color and body appearance (which are the serious signs of protein-calorie malnutrition) as by edema (Am J Public Health 63: 1973). Clinical assessment requires highly qualified clinical staff in order to provide reliable and valid results.

Anthropometric indicators are inexpensive, non-invasive and relatively easy to obtain. A number of anthropometric indicators are W/H, H/A, W/H, MUAC, MUAC/A and MUAC/H. According to the findings of the survey, the data on the ages of the children in the orphanages was not estimated to be reliable. No institution was able to show the birth certificates of the children. This is a big problem found in many developing countries. Weight-for-age and height-for-age are mostly used in nutritional research. For example, the z-score value of H/A is denoted as:

$$z = (H_s - H_a) / \sigma_a$$

(1)

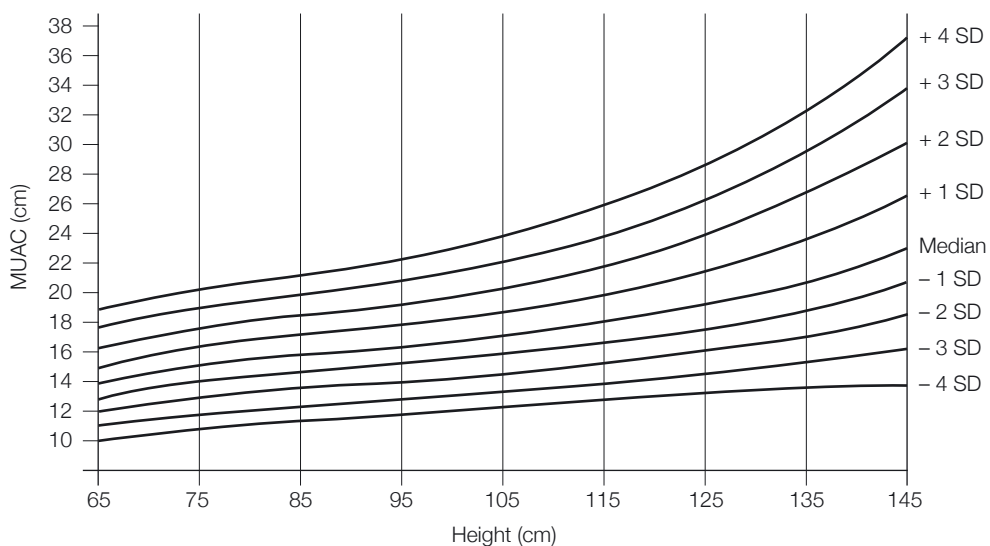
Where H_s is the height of the study child and H_a is the height of the reference child at age a, which increases with age, and σ_a is the standard deviation of the height of the reference children at age a, which does not increase with age. W/A and W/H are defined similarly. It can be seen that when the ages in the study are not reliable, the z-scores value will also no longer reliable. Growth references are specifically calculated every one month.

In the situation of the orphans in Myanmar, we provided MUAC-for-height or MUAC alone, as the indicators to measure nutritional status. Using MUAC alone with a QUAC stick was a more accurate and rapid method to use with large population, because it did not require the use of a table, or reference to a growth chart. The QUAC (Quaker Arm Circumference) stick avoided the use of a table, by having the MUAC thresholds defining malnutrition marked on a 'height' stick (Mei, Grummer-Strawn, Onis, and Yip, 1997). MUAC was measured by using a steel tape with the left arm hanging relaxed,

midway between the tip of the acromion, and through the olecranon process, with the tape touching the skin but not compressing the tissue. This was measured to the nearest centimeter. The stick was placed firmly and uprightly on a platform against a vertical wall. The children then stood straight with their backs flat against the height measure. An MUAC measurement below -2 SD defined a moderate deficit, and below -3 SD, a severe deficit. If it was above -2 SD, there was no deficit. However when we measured MUAC, the important thing that we needed to make sure of, was to identify correctly the mid-point of the upper arm and not to pull too tightly on the tape. MUAC growth references suggested between 65cm to 145cm heights (which is defined as six months to 119 months in the WHO references).

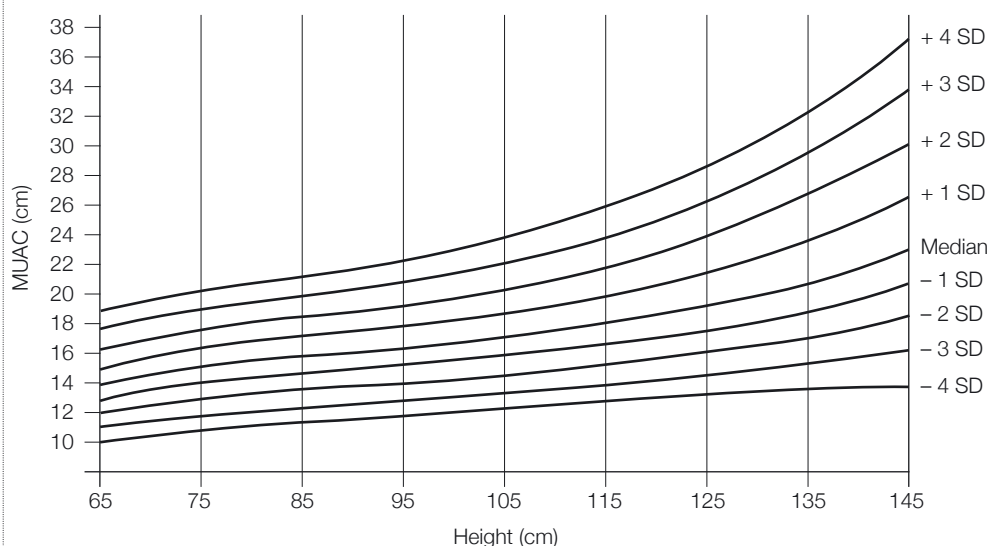
The use of anthropometry amongst adolescents is problematic and there is not data suggesting an MUAC which is age independent in this age group. The interpretation of anthropometric measures in adolescents is complicated by the changes in body composition, body shape and musculature that occur during puberty. In this study, we provided a MUAC measurement with a QUAC stick for the height group up to 145 cm with separate growth charts of boys and girls, in order to measure nutritional status. MUAC-for-height references curves for boys, girls were stated at Figure 1 and Figure 2.

Figure 1. MUAC-for-height references curves for boys of height 65–145cm



Source: Mei, Grummer-Strawn, Onis, and Yip, 1997, p.6

Figure 2. MUAC-for-height reference curves for girls of height 65–145 cm



Source: Mei, Grummer-Strawn, Onis, and Yip, 1997, p.6

The reason why MUAC is provided for measuring the nutritional status of children is because empirical evidence has been found in the field of nutritional studies, that MUAC can give a certain reliability and precision, and is independent of age. To obtain precise weight and height measurements in the field, three people are required (Frontiers, 1995). Two people are required to take measurements and the last one is required to supervise, record the measurements and to calculate the indicator values. The independence from the effect of age is classified using two components, the first being that the indicator value is not influenced by the age of the child, the second being that the predictive value (that is, the power of predicting mortality) of the indicator is independent of the age of the child. The predictive power of MUAC is independent of age, even in children below one year of age (Briend and Zimicki, 1986). Feeney (2004) found that in a study in Ethiopia, the majority of errors were made through the erroneous recording of MUAC values (for example, 102 mm recorded as 120 mm), rather than through deciding whether MUAC values fell above or below a threshold value. The recording errors did not have consequent problems, because the status of nutrition was decided by the threshold value. Chen, Chowdhury, and Huffman, (1989) studied the associations between anthropometric indicators and subsequent mortality rates in Bangladeshi children. The

study showed that all indicators were negatively associated with mortality. Trowbridge and Sommer (1981) examined the sensitivity and specificity of indicators by using the data of Chen, Chowdhury, and Huffman (1989) and found that MUAC alone performed better than MUAC/H. Alam, Wojtyniek, and Rahaman (1989) analyzed the use of MUAC, MUAC/A, MUAC/H, H/A, W/A and W/H, in order to predict the death after three and six months of study in Bangladesh. The study reported that the sensitivity at high levels of specificity was highest for MUAC and MUAC/A, immediate followed by W/A, H/A, and MUAC/H and was lowest for W/H. Briend and Zimicki (1986) found that the age-independence of MUAC was superior in terms of sensitivity and specificity to W/S, H/A and W/A in Senegalese children. The capability of common indicators with regard to key properties of case-detection methods for screening and for case detection of malnutrition in the community was shown in Table 1.

2. Sickness

Sickness of children is one of the most important facts of physical well-being. In the real world in Myanmar there were no records on the children's health progress or status, at any of the institutions. The only way to capture the health status of the children was to tap their memories and the memories of their managers or care-givers. According to these facts, sickness was measured by asking the children or their manager whether the children had been sick within the previous year with any disease for the orphanages as a whole, strong sickness was measured with the question "how many children have been hospitalized with any disease within one year?" These measurements taken by recalling their memories were quite reliable in the situation where no records existed. In this case we did not go into disease specific and age specific illness, because of the reliability of the data and the scope of the model (which captured the general well-being of orphans).

Table 2. The Capability of Common Indicators with Regard to Key Properties of Case-Detection Methods for Screening and for Case Detection of Malnutrition in the Community

Property	Indicators						
	Clinical	W/A	H/A	W/H	MUAC	MUAC/A	MUAC/H
Simplicity	No	No	No	No	Yes	No	Yes (by QUAC stick only)
Acceptability	No	No	No	No	Yes	Yes	Yes (by QUAC stick only)
Cost	No	No	No	No	Yes	Yes	Yes (by QUAC stick only)
Objectivity	No	No	No	Yes	Yes	No	Yes
Independence of age	Yes	No	No	No	Yes	No	Yes
Precision (reliability)	No	Yes	No	No	Yes	Yes	Yes (by QUAC stick only)
Accuracy	No	No	No	No	Yes	No	Yes
Sensitivity	NA	Yes	No	No	Yes	Yes	Yes
Specificity	NA	Yes	No	No	Yes	Yes	Yes
Predictive value	NA	Yes	No	No	Yes	Yes	Yes

Source: Prudhon C., et al. (2006) SCN Nutrition Policy Paper 21, p.15

3. Hunger

In terms of the orphans in Myanmar, it was also necessary to investigate hunger as one of the aspects of physical well-being. According to the field survey, some of the children in certain orphanages stated that they were hungry, but not seriously hungry, after meals or at the end of the day. When people lacked one single micronutrient alone or a combination of micronutrients, hidden hunger was presented. Micronutrient deficiencies can cause serious health problems, because they compromise the immune system by allowing infections to take hold. In this study, hunger was measured using a question which asked whether the child was hungry after a meal or not, and requiring a simple "yes" or "no" answer. This question covered all age groups, from five to seventeen years.

4. Accidents

The incidence of accidents is an indicator that measures the safety of children. In other countries' literature, accidents are usually found under the domain of risk and safety. In this study, we assumed that accidents represented the physical safety of the children. Since the children lived in institutions, they were not under the care of their parents. The institutions may not have been able to give close care and attention to

each child, because there were many children in each of the institutions. Safety was measured using a question as to whether the child had had an accident within the previous month or not. This used the same assumption as for the sickness indicator, because if the child or manager was able to recall accidents, it was likely to be within the one month period. This question covered all age groups, from five to seventeen years old.

5. Death rates

Death rate reflects the strongest evidence for whether the institutions can provide sufficient physical wellbeing to those children or not. The rate of death is measured in accordance with each orphanage. In this case, death with any diseases and cases within one year is taken into account.

(a) Educational Well-Being

In general, one of the most important reasons why children are placed under the care of institutions is because of education. The status of educational well-being is measured through test scores. In other countries, the enrollment ratio is one of the indicators used to measure educational status. In the case of the orphans in Myanmar, this was not a relevant indicator, because almost all of the children were enrolled in schools. To measure educational achievement by taking report cards or achievement test scores from school was also irrelevant, because it was difficult to get hold of report cards or test scores, and even if the tests scores could have been obtained from the school, they would have been bias. As a result of these reasons, the most reliable method to measure achievement test scores was to set an exam by researcher with reference to the grade of the children. Questions were set in accordance with the grade of the children, and the same questions were used in all the orphanages.

In the domain of educational well-being, the achievement test scores attained in reading and writing Burmese, mathematics and science were measured by the setting of an exam. Tests for reading and writing in Burmese were important to test, because most of the children came from remote parts of the country and were from diverse ethnic groups. Their literacy levels in terms of reading and writing Burmese were therefore necessary and especially important for them. Mathematics and science skills would help to provide the level of development of the cognitive well-being of the children. Reading, writing and mathematics tests were set in all age groups. The science test was held for grades 9, 10 and 11, because these grades were more familiar with science than the lower age groups.

(b) Emotional Well-Being

Not only physical well-being is important, but also mental well-being, as it supports a child's overall well-being. In a report by UNICEF in 2007 (entitled 'Child Well-Being in Developed Countries'), the emotional well-being of children was defined under the domain subjective well-being, using the indicators: self-defined health, self-defined personal well-being and self-defined school well-being. Family, sibling and peer relationships were also associated with the emotional well-being of the children. In the case of the orphans in Myanmar, emotional well-being was measured using indicators covering happiness in school, happiness in their orphanages, and the relationships with their peers. Normally, self-defined happiness is measured with ordinal scales: very happy, happy, neutral, unhappy and very unhappy. Having three or more close friends was one of the indicators used to measure peer relationships, in the publication 'Health Setting for Young People in Canada' (Boyce, Matthew, and Roache, 2008).

In this study, we suggested that closed "yes" or "no" questions should be used to measure the happiness of the children, because the younger children could not state the exact utility level of their happiness or satisfaction, when they were asked by ordinal scales, and according to the findings in the field survey. If they could not state the exact utility levels using ordinal scales, then questioning them in this way was no longer reliable. For the children above 10 years old, ordinal skill such as "very unhappy", "unhappy", "neither happy nor unhappy", "happy" and "very happy", should be used to measure emotional happiness. In this case, children who only said that they are happy or very happy or having positive feelings is determined as having good emotional well-being. Furthermore, it was not very reliable to decide the peer relationships of orphans using the number of close friends they had, because children normally state many friends as being in this category (according to the findings of the field survey). Therefore, the most reliable method was to not only ask the children whether they were happy at school or the orphanages, or had good relationships with their friends or not, but also by examining the researcher's observational skills when putting possibly positive or negative questions to the children. For example, positive and negatives questions are as follow.

(a) Positive questions

1. Are your friends kind and helpful to you?
2. Are your teachers kind and helpful to you?
3. Are your chiefs of the institutions kind and helpful to you?

(b) Negative questions

1. Do you have bad feeling about financial hardship?
2. Have you had discriminated among friends or at school
or at the orphanages?
3. Do you miss your home all the time?
4. Have you had any punishment at school or at the orphanage?

3.5 Building the Index

After defining all of the domains and their respective indicators, the orphanage well-being index was built. The orphan well-being index is a data driven index, because we chose the most reliable and readily available data in order to build the index. The index was built taking into account three theoretical considerations of the causal indicator model.

(a) The Nature of the Construct

The domains or constructs of the model were determined by the use of a combination of available and reliable indicators. The changes in indicators could therefore cause changes in the domains (Borsboom, Mellenbergh, and Heerden, 2003/2004).

(b) Direction of Causality

The causality flows from the indicators to the construct, and the variations in the physical, emotional and educational domains do not cause variations in the indicators.

(c) Characteristics of the Indicators

Since the indicators made up of the constructs, and the indicators themselves, were chosen using the criteria of data reliability and availability, they did not need to have internal consistency or correlations, and did not require having the same antecedents and consequences. By adding or dropping an indicator, this may have changed the conceptual domain of physical, emotional and educational well-being.

In order to provide, not only the overall well-being of the orphans in each orphanage, but also the rank order which could best decide the level of well-being (better or worse), we set all the indicators with the same indirections in the index. Also, the population was known in the model, so according to these assumptions, the domains, indicators and scale of the well-being index were as follows.

(1) Physical Well-Being

1. The percentage of children above z-scores of -2SD measured by MUAC with a QUAC stick (children's height under 145 cm)
2. The percentage of children who were not sick within one month
3. The percentage of children who were not hospitalized within one year
4. The percentage of children who said "I am not hungry" after a meal, and
5. The percentage of children who did not have an accident within one month.
6. (100- percentage number of death with any cases and diseases) within one year

(2) Educational Well-Being

1. The percentage of children who achieved in Myanmar reading test.
2. The percentage of children who achieved in Myanmar writing test.
3. The percentage of children who achieved in Mathematics.
4. The percentage of children who achieved in Science test at Grade 9, 10, and 11

(3) Emotional Well-Being

1. The percentage of children who were happy at school
2. The percentage of children who were happy at the orphanage, and
3. The percentage of children who had good relationships with their friends.

The overall well-being of the orphans was then defined as follows:

$$W = W_p + W_I + W_e$$

(2)

where,

W = the overall well-being of an orphan

W_p = the physical well-being of an orphan

W_I = the educational/intellectual well-being of an orphan

W_e = the emotional well-being of an orphan

The orphan well-being index was built by summing the indicator scores under each domain. When we combined the indicators to form domains, we did not impose any weighting. For example, to obtain the physical well-being domain we had to combine six indicators: nutritional status, sickness within one month, hospitalized with one year, hunger, the number of accidents and death rate. We might have sought to argue that the nutritional status of the children should be given a greater weighting than the other variables in the domains. However, even if I had found the evidence to sustain such an argument, there was still the question as to how to decide what extra weighting to give to nutritional status. Therefore, I decided to treat each variable as having an equal weight, due to the absence of any theoretical or empirical justification using a for weighting (like the EU index, and the local well-being index from England). Since we were using a causal indicators model in developing the index, weighting with a factor analysis or a principal component analysis, or checking internal consistency using Cornbach's Alpha model, were not justified. As a result, the overall well-being of a child was defined as:

$$W_j = \sum_{d=1}^D \sum_{i=1}^{N_d} X_{di}^j$$

(3)

where,

- j is the number of the orphan
- D is the number of domains
- N_d is the number of indicators in domain d
- X_{di}^j is the value of the i^{th} indicator under the d^{th} domain of the j^{th} child.

$$OWI_k = [\frac{1}{D} \sum_{d=1}^D \frac{1}{N_d} \sum_{i=1}^{N_d} \frac{X_{di}^k - X_{di}^{\min}}{X_{di}^{\max} - X_{di}^{\min}}] \times 100$$

(4)

where,

OWI_k = the orphan well-being index value of the k^{th} orphanage

k is the number of orphanages

D is the number of domains (in this index, it is three)

N_d is number of indicators in domain d

X_{di}^k is the value of the i^{th} indicator under the d^{th} domain of the k^{th} orphanage

X_{di}^{\min} is the minimum scale of the value of the i^{th} indicator under the d^{th} domain (in this index, it is 0)

X_{di}^{\max} is the maximum scale of the value of the i^{th} indicator under the d^{th} domain (in this index, it is 100)

The orphan well-being index was built using the following steps. First, we normalized the indicator scores and summed them up under each domain. Each domain score was then averaged by using the number of indicators. I then summed up all domains, and the well-being index score was taken as an average by the number of its domains. In order to compare easily across orphanages, regions, and types, the overall index score was multiplied by 100. The greater the index value, the better the state of well-being, because the same positive direction was used for all the indicators when building the index.

Since Orphan Well-being Index was built as preliminary model for situation of Myanmar, the most fundamental domains and indicators were only included. The direction of all indicators took positively and it reflected how better or worse within orphanages. OWI index was one number like GNH.

1. OWI can be compared in different institutions or orphanages in order to see which orphanages have OWI scores.
2. OWI can also be compared in different districts surveyed in order to see which districts have higher OWI scores.

3. OWI can be compared across time to see if OWI is decreasing or increasing after conducting surveys.
4. OWI can be decomposed by dimension (or indicator), by district, by gender, by ethnic, by age group etc.

In this way we can see how shortfalls in OWI vary across disaggregated levels. In this way OWI can be used as an instrument of policy, and can capture a great deal of interconnect information.

04. Summary and Conclusions

Insufficient macro data, a lack of baseline data and a lack of documentation in the real world situation should be noted as constraints, and in order to provide more specific domains and detail indicators. Even though physical well-being, emotional well-being and education theoretically are constitutes of more specific indicators and measuring methods, orphan well-being is built only with applicable methods and suitable theories.

This study has contributed the most reliable and relevant approach to date, for those who wish to conduct an empirical study, not only in the field of orphan welfare, but also in the field of nutrition studies. Since there was previously no baseline data regarding the well-being of orphans in Myanmar, this study has contributed an initial approach on how to measure the well-being status of these children, and later it is expected to develop an index value for orphan well-being annually in Myanmar, and across the nation as a whole. The rank order values and indices are expected to contribute to appropriate policy reformulations in the field of public policy, civil society, orphanages and for the families of the children. The study suggested that even though WHO growth references were designed to be a global standard, reflecting optimal growth, nutrition and development for all children in all countries, they were not suitable to be used in a developing country like Myanmar. The Government should develop national growth references, by observing well-nourished Myanmar children.

References

- Alam N., Wojtyniak, B., and Rahanman, MM. (1989). **Anthropometric indicators and risk of death.** Am J Clin Nutr, 49, 884-888.
- Bollen, K., and Lennox, R. (1991). **Conventional wisdom on measurement: a structural equation perspective.** Psychological Bulletin 110/2: 305-315.
- Borenstein, M. H., and Smith, D. C. **Cognition and wellbeing:** An overview. Bornstein, M. H., Davidson, L., Keyes, C. L. M., Moore, K., and the Centre for child well-being (Eds.). (2003). Well-being: Positive development across the life course. Mahwah, New Jersey: Lawrence Erlbaum Associates Publishers. (in press)
- Borsboom, D., Mellenbergh, GJ., and Heerden, JV. (2003). **The theoretical status of latent variables.** Psychological Review, 110(2), 203-219.
- Borsboom, D., Mellenbergh, GJ., and Heerden, JV. (2004). **The concept of validity.** Psychological review, 111(4), 1061-1071.
- Borsboom, D., Mellenbergh, GJ., and Heerden, JV. (2004). **The concept of validity.** Psychological review, 111(4), 1061-1071.
- Boyce, W. F., Matthew, A. King., and Roache, Jennifer. (2008). **Healthy settings for young people in Canada.** Public health agency of Canada, from <http://www.phac-aspc.gc.ca/dca-dea/yjc/summ-eng.php>. Retrieved at 8.1.2009.
- Bradshaw., J., Bloor, K., Hubby, M., Rhodes, D., Sinclair, Ian., and Gibbs, L. (2009). **Local index of child well-being.** Summary reports, Communities and local government. <http://communities.gsi.gov.uk>. Retrieved at 11.1.2009.
- Briend, A., and Zimicki, S. (1986). **Validation of arm circumference as an indicator of risk of death in one to four year old children.** Nutr Res, 6, 249-261.
- Chen, L., Chowdhury, A., and Huffman, SL. (1989). **Anthropometric assessment of energy-protein malnutrition and subsequent risk of mortality among preschool aged children.** Am J Clin Nutr, 33, 1836-1845.
- Churchill, G. (1979). **A paradigm for developing better measures of marketing constructs.** Journal of marketing research 16, 64-73.
- Clinical Assessment of Nutritional Status. (1973). **Am J Public Health**, 63, 18-27. <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1775325>.

- Diamantopoulos, A., and Siguaw, J. (2006). **Formative verses reflective indicators in organizational measure development: A comparison and empirical illustration.** British Journal of Management 17(4), 263-282.
- Diamantopoulos, A. (2006). **The error term in formative measurement models: interpretation and modeling implications.** Journal of Modeling in Management 1 (1), 7-17.
- Edwards, J. R., and Bagozzi, R. P. (2000). **On the nature and direction of relationships between constructs and measures.** Psychological Methods, 5, 155-174.
- Feeney, B. (2004). **Investigation into community volunteers using an admission criteria of middle upper arm circumferences of below 110mm and length equal to or greater than 65cm for children to a community programmer for severely malnourished children in Ethiopia.** Master of Science, London School of Hygiene and Tropical Medicine, London.
- Fornell, C. (1982). **A second generation of Multivariate Analysis.** New York: Praeger.
- Frontiers, M. S. (1995). **Nutritional guidelines.** Paris: MSF.
- Go'mez, F., Tamos, G. R., and Cravioto, J. (1952). **Nutritional Recovery Syndrome,** Pediatrics. 10,513.
- Halle, T. G., and Zaff, J. F. **Social emotional well-being: An overview.** In Bornstein, M. H., Davidson, L., Keyes, C. L. M., Moore, K., and the Centre for child well-being (Eds.). (2003). **Well-being: Positive development across the life course.** Mahwah, New Jersey: Lawrence Erlbaum Associates Publishers. (in press)
- Javis, CB., Mackenzie, S. B., and Podsakoff, P. M. (2003). **A critical review of construct indicators and measurement model misspecification in marketing and consumer research.** Journal of consumer research 30(3), 199-218.
- Maund, L., and Matta, S. (2006). **A Buddhist approach to HIV prevention and AIDS care. A training manual for monks, nuns and other Buddhist leaders.**
- Mei. Z , Grummer-Strawn, L. M., Onis, M. de., and Yip, R. (1997). **The development of a MUAC-for-height reference, including a comparison to other nutritional status screening indicators.** Bulletin of the World Health Organization 1997 (75), 333-341.
- Pollard, E. L., Davidson, L., and the Centre for Child Well-Being. (2001). **Action research in family and early childhood: Foundations of child well-being.** Paris: UNESCO, 18, from <http://www.childwellbeing.org/c-pdfs/UNESCO.pdf>. Retrieved at 4.1.2009.

- Prudhon, C., Briend, Andre., Prinzo, Z. W., Daelmans, Bernadette, M. E. G., and Mason, J. B., and guest editors. (2006). **WHO, UNICEF, and SCN informal consultation on community-based management of severe malnutrition in children**. SCN nutrition policy paper 21, 15.
- Rogers, M. F., and Leavitt, C.H. The importance of physical well-being and its impact on well-being and development. In Bornstein, M. H., Davidson, L., Keyes, C. L. M., Moore, K., and the Centre for child well-being(Eds.). (2003). **Well-being: Positive development across the life course**. Mahwah, New Jersey: Lawrence Erlbaum Associates Publishers. (in press)
- Rossiter, J. (2002). **The C-OAR-SE procedure for scale development in marketing**. International Journal of research in marketing, 19(4), 1-31.
- Shein, N., and Myint, H. H. (2001). **The poverty ratio in Myanmar. Paper presented at the UNSD workshop on development indicators**. Manila, Philippines, from <http://www.nscb.gov.ph/events/ASEAN/papers/country/Myanmar%20.pdf>. Retrieved at 18.2.2009.
- Trochim, W. (2006). from <http://www.socialresearchmethods.net/kb/index.php>.
- Trowbridge, F., and Sommer, A. (1981). **Nutritional anthropometry and mortality risk**. Am J Clin Nutr, 34, 2591-2592.
- UNICEF. (2007). **An overview of child wellbeing in rich countries**. Child Poverty Perspective, Report card 7, from http://www.unicef-irc.org/publications/pdf/rc7_eng.pdf. Retrieved at 8.1.2009<?>

