# A confirmatory factor analysis of scores on Inventory of School Motivation (ISM), Sense of Self Scale, and Facilitating Conditions Questionnaire (FCQ):  A study using a Philippine sample

**Fraide A. Ganotice, Jr.**
*Palawan State University, Philippines*

**Abstract**  This study was conducted to explore the validity of Inventory of School Motivation (ISM), Sense of Self Scale (SOS), and Facilitating Conditions Questionnaires (FCQ), developed by Dennis McInerney. A Confirmatory Factor Analysis (CFA) was conducted on the results of the items in the questionnaires involving 378 high school Filipino students. The ISM has four dimensions: mastery, performance, social, and extrinsic goals; while the SOS has also four dimensions: sense of purpose, sense of reliance, negative self esteem, and positive self esteem.  On the other hand, FCQ is composed of eleven dimensions:  positive peer influence, school valuing, parent support, teacher support, peer help, leave school, pride from others, negative parent influence, affect to school, negative peer influence, and university intention.  Based on the responses, the internal reliability of the instruments were all adequate.  The results indicate that confirmatory factor analyses conducted for the ISM, Sense of Self, and FCQ scales indicated a good fit between the models and the data using the goodness-of-fit index.   Thus, the CFA approach used in this study provided a strong validation, with the Filipino sample.  Discussions focused on the possible research explorations in the future involving bigger Filipino participants with the use of the said validated instruments.

**Keywords**: *Motivation, sense of self, facilitating conditions*

## Introduction

Interest in cross-cultural comparisons has grown over the last 20 years (Van de Vijver & Hambleton, 1996).  Seemingly, researchers do not only end their investigations with single culture but extend these to include cross-cultural studies in order to account for diversity and convergences of other cultures.  With the advent of cross-cultural research, validation of instrument has become an important methodological aspect of cross-cultural research studies.   Research on samples from different cultural groups need to consider whether the scores obtained are

comparable. Equivalence and bias or differential item functioning are important issues that need to be addressed before meaningful cross-cultural comparisons can be made (Van de Vijver & Leung, 1997; Fisher, 2004).

Agreeably, the application of an instrument in a new cultural group involves more than simply producing text in another language, administering the translated instrument, and comparing the results. The following questions may serve as reminders for reflection before cross-cultural researchers start to cross the boundaries of other cultures specifically with instrumentation: "Does the construct apply to the target group or does it show ethnocentric bias? Are the behaviors associated with the construct similar in the source and target groups? Is the measurement procedure (e.g., stimulus and response format) adequate for application in the target groups? Are the language loadings within the vocabulary level of the target groups? Is the instrument free from item bias?" These are only some of the questions that need to be addressed in order to minimize the impact of bias in cross-cultural measurement.

While it is an acceptable practice to adopt and/or adapt a foreign-made instrument, caution is necessary on its application if it is to be used with other groups other than its intended population (Hambleton, 2001). Validation of the instrument is an essential phase designed to ascertain the psychometric properties of a foreign-made test when applied to local setting. In the Philippine context, students' cultural backgrounds abound that need to be considered when a researcher does cross-cultural investigation. It is therefore necessary for him/her to be reminded of the importance of validation of the instruments when it is to be used within the confine of Philippine classrooms.

One of the foreign-made instruments whose psychometric properties need an evaluation when applied to the Philippine setting is the Inventory of School Motivation (ISM). As McInerney (1991) stressed, this instrument is used to define scales that are relevant to examining students' motivation in cross-cultural contexts. Hence, if it is to be used in other countries like the Philippines, it is imperative to conduct further validation study in order to shed light or issues concerning its validity and applicability to the distinct Filipino culture.

Together with the ISM, McIneryney and his group developed the Sense of Self scale and Facilitating Conditions Questionnaire to complete the set of questionnaires. These instruments were tailored fit within the framework of Personal Investment Theory (Maehr & Braskamp, 1986; see also Maehr & McInerney, 2004), one of the interesting theories on motivation concerned with the significant role played by social and cultural contexts in determining motivational patterns in performing achievement tasks of learners. Hence the personal investment theory seems very well suited to provide a theoretical framework for comparing between-group differences across social and cultural groups. Specifically, the theory designates three basic components of meaning as critical to determining personal investment in specific situations: (1) Sense of self, (2) perceived goals of behavior in given situations, and (3) perceived facilitating conditions for pursuing these goals. Personal Investment (PI) theory is particularly relevant in investigations into how individuals of varying social and cultural backgrounds relate to differing achievement situations. This is because it does not assume that people from a given culture or group will invest effort in the same

achievement situations or, if they do, for the same reasons, as those from other cultures and groups. PI theory also emphasizes the role played by social and cultural contexts in determining motivational patterns in performing achievement tasks.

Specifically, the Inventory of School Motivation (McInerney, Roche, & Marsch, 1997; McInerney & Sinclair, 1991; 1992) was designed as an exploratory instrument through which a range of motivation-salient constructs drawn from Maehr's personal investment model could be identified in educational settings across diverse groups. In addition to this, because performance goals and achievement are other referenced, self-worth is determined by an individual's perception of ability to perform and to compete successfully. Hence, when a student tries hard without being completely successful (in terms of established norms) his/her sense-of-self worth is threatened. Guided by this framework, McInerney (in press) included Sense of Self scale which is the second part of ISM. On the other hand, because of the potent impact of significant others in the motivation of students, the Facilitating Conditions Questionnaire (FCQ) was constructed with the assumption that although individuals' internal motivations (such as their goals and expectancies) may promote positive academic behavior and achievement, external (or at least externally referenced) forces in students' social environments may facilitate or inhibit translation of these internal motivations into actual behavior (McInerney, Dowson, & Yeung, 2005).

The ISM has been validated in countries involving sample Australian, American, African, Chinese students (McInerney & Ali, 2006). In the Philippines, the reliability of the ISM has been initially explored by Watkins, McInerney, & Boholst (2003) utilizing 86 fourth year Filipino secondary school students in the central Philippines. Generally, the results of the research support the internal consistency reliability and construct validity of responses to the ISM by the said 86 students. Their study ended with a recommendation for a confirmatory factor analysis based on the responses to the ISM by a much larger sample of Filipino students that is expected to strengthen their claim.

In a separate study involving elementary and high school students in Arizona, McInerney, Dowson, and Yeung (2005) explored the construct validity and applicability of the Facilitating Conditions Questionnaire (FCQ). The result of their study supports the FCQ's applicability to these elementary and secondary students. The goodness-of-fit and alpha reliability measures for the models tested with the whole sample provided preliminary confidence that the FCQ may yield valid scores with both the elementary and the secondary subsamples.

Although the psychometric properties of ISM and FCQ scales have been examined to some extent through exploratory factor analysis, stronger validation of the instrument requires an approach such as confirmatory factor analysis using samples from other populations. The utility of the said instruments may encompass the Philippine landscape where, like in the case of other countries, people's cultures are diverse. However, before these instruments can be used for research purposes, it is necessary to verify the psychometric usefulness, factor structures among others which are prerequisite for an appropriate interpretation of the ISM and FCQ scores in a diverse culture. Specific to the present study, this reports if the said instruments capture the array of tests constructs, which the

authors have established using other populations, when applied to the Philippine setting. Moreover, this study tested the factor structures of the mentioned instruments using the Philippine student samples through the use of confirmatory factor analysis.

## Overview of the Present Study

The purpose of this study was twofold: (a) to conduct a confirmatory factor analysis to assess the factor structure of the scale items obtained from 43–item Inventory of School Motivation (ISM); 26-item Inventory of School Motivation: Sense of Self Scales; and 55-item Facilitation Conditions Questionnaire (FCQ); and (b) to investigate the estimates of internal consistency and construct validity of the ISM and FCQ scores.

## Method

### Participants

Participants of the study were 378 (160 males and 218 females) first year to fourth year high school students in public and private schools in Metro Manila and a laboratory school in the province. The age of the participants ranged from 12 to 20 years old, with a mean age of 14.62 and *SD* of 1.39. These students were assured that their responses would remain confidential and would not, in any way, influence their grade.

### Measures

For all the 124 items considered in this study, a 5-point Likert-type scale with a response scale ranging from 1 (strongly agree) to 5 (strongly disagree) was used. The reliability, mean and standard deviation of each scale (coefficient alpha) in the present study are presented in Table 5.

**Inventory of School Motivation (ISM).** There are four dimensions of ISM which include mastery goal, performance goal, social goal, and extrinsic goal. These achievement goals were assessed with 43 items of the ISM. Achievement goals are cognitive representations of the different purposes that students may have in different achievement situations and are presumed to guide students' behavior, cognition, and feelings as they become involved in academic work (McInerney, et al., 1997).

Mastery goal is defined as the degree to which a student is motivated by intrinsic self-referenced goals. There are 11 items which comprised the mastery goal (Cronbach's $\alpha$=.81). It is further grouped into task (e.g., "I like being given the chance to do something again to make it better.") and effort (e.g., "I don't mind working a long time at school that I find interesting.")

Performance goal is the degree to which a student is motivated by competitive other-referenced goals (Cronbach's $\alpha$=.81). This dimension of ISM has 12 items distributed between competition (e.g., "Winning is important to me.");

and social power (e.g., "I work hard at school that I will be put in charge of the group.").

In addition, Extrinsic goal is the third dimension of the ISM (Cronbach's α=.88). This is defined as the degree to which a student is motivated by praise and rewards. There are 12 items which are measured this dimension as praise (e.g., "Praise from my teachers for my good schoolwork is important to me."); and token (e.g., "I work best in class when I can get some kind of reward."). Social goal is the fourth dimension of the ISM (Cronbach's α=.73). This is described as the degree to which a student is motivated by competitive other-referenced goals. Social goal is composed of 8 items distributed into social concern (e.g., "It is very important for students to help each other at school."); and affiliation (e.g., "I do my best work when I am working with others."). The described composition of ISM questionnaire is based on the hierarchical, multidimensional model of goal orientations designed by McInerney and Yeung (2000).

**Inventory of School Motivation.** Sense of self refers to the more or less organized collections of perceptions, beliefs, and feelings related to who one is. It is presumed to be composed of a number of components such as sense of competence, sense of autonomy, and sense of purpose, each also contributing to the motivational orientation of the individual and interacting with the motivational previously described. There are 4 sense-of-self scales, for a total of 26 items. They include the following dimensions: sense of purpose (Cronbach's α=.85), sense of reliance (Cronbach's α=.84), negative self esteem (Cronbach's α=.79), and positive self esteem (Cronbach's α=.76) .

Sense of purpose is defined as the degree to which a student values school for the future (e.g., "I try hard to do well at school so that I can get a good job when I leave."). Sense of purpose is measured by 6 items. The second dimension of sense of self scale is sense of reliance defined as the degree to which a student is self-reliant and confident within academic settings (e.g., "I do not need anyone to tell me to work hard at school"). Eight items measured this dimension. The third dimension is negative self esteem which is the degree to which the student holds negative feelings about his/her general academic ability at school (e.g., "I am always getting into trouble at school."), composed of 5 items. The last dimension is positive self esteem, the degree to which a student holds positive feelings about his/her general academic ability at school (e.g., "I think I am as good as everybody else at school.") measured by 5 items.

**Inventory of School Motivation: Facilitating Conditions Questionnaire (FCQ).** Research on school motivation has assumed that individual students' personal goals, expectancy and values tend to have considerable influence on their academic behaviors and academic achievement. McInerney (1988; 1989; 1991; 1992), however, proposed that whereas the individual's internal drive may promote academic behavior and achievement, there are external forces in the school environment that may facilitate or inhibit the translation of these motivational forces into actual behavior. To examine the potential impacts of these external environmental factors, McInerney (1988; 1989; 1991; 1992) designed a Facilitating

Conditions Questionnaire (FCQ) based on Maehr's (1984) hypothesis of action possibilities (also see Maehr & Braskamp, 1986).   There are 11 scales and 55 items which composed the FCQ.

University intention is the first dimension of FCQ.  It is defined as the degree to which a student perceives that he/she can complete college (e.g., "I am the kind of person who can complete college or university"; Cronbach's α=.88). This is measured by 5 items.  The second dimension is school valuing which deals with the importance of education to students (e.g., "Education is important to me to get a job; Cronbach's α=.88).  School valuing is measured by 9 items.  In addition, there are 6 items that measured parent support which is defined as the degree of a student's perception of positive parental support (e.g., "My mother helps me with my schoolwork"; Cronbach's α=.88). Six items measured teacher support, a student's perception of positive teacher support (e.g., "My teachers help me with my schoolwork"; Cronbach's α=.77).  In addition to this, there are 5 items for peer help, the extent to which a student perceived that his/her peers help him/her (ex. "Some of my friends help me with my schoolwork"; Cronbach's α=.70).   Four items measured student's perception of influences on leaving school (e.g., "My mother doesn't mind If I leave school when I want to";  Cronbach's α=.90).  There are 4 items that measured pride from others, the importance of a student of pride from others in his/her school achievement (e.g., "It's important for my father to be proud of my school work"; Cronbach's α=.84).   Moreover, there are 5 items measured negative parent influence, a student's perception of negative parent support (e.g. "My father doesn't pay any attention when I bring home report cards"; Cronbach's α=.90).  There are 3 items measuring affect to school, which describes the inherent value given by a student to school (e.g., "I like studying"; Cronbach's α=.76).    Additional 4 items measured negative peer influence, a student's perception of negative peer support (e.g., "Some of my friends tell me I should leave school when I can"; Cronbach's α=.84); and the remaining 4 items measured positive peer influence, the degree a student perceives their peers value schooling (e.g., "Most students in my class will go on to college or university"; Cronbach's α=.91).

## Administration

With the intent of standardizing the administration of the questionnaires, teachers and guidance staff who administered the questionnaires had received a copy of the instrument in advance, along with the brief written account of the nature, purpose, and specific instructions of the administration.    Those who administered the questionnaires were instructed not to interpret any of the items for the students, instead to advise the students to give their best judgment on the items.

## Confirmatory Factor Analysis (CFA)

CFAs assess the extent to which the observed indicators (items) reflect the structure of the underlying constructs.  CFAs allow the researcher to specify not only how many factors are measured by a given set of items but, also, which items

function as indicators of which factors.   This analysis is conducted to test hypotheses or confirm theories about the factors one expects to find (Vogt, 1999). Relative to the present study involving high school Filipino students, CFA will assess the factor structure of the scale items from 43-item Inventory of School Motivation (ISM); 26-item Inventory of School Motivation: Sense of Self Scales; and 55-item Facilitating Condition Questionnaire (FCQ).

## Goodness-of-Fit Indicators

Although a large number of Goodness-of-Fit Indexes (GFIs) are available, the relative performance of them has left considerable room for debate (Huang & Michael, 2000).  The multiple indexes recommended by Hu and Bentler (1995) cited in the article by Hoyle and Panter (1995) are reported in this investigation.

Multiple indices provided a comprehensive evaluation of model fit (Hu & Bentler, 1995; 1999). I examined the traditional chi-square fit index.  However, given the known dependency of the chi-square statistic on sample size (Bentler & Bonett, 1980; Byrne, 1994), and that the chi-square values are overly stringent in evaluating exact fit, I also examined other fit indices.   In the present study, the following goodness-of-fit measures were also used: (a) Comparative Fit Index (CFI), (b) Bentler-Bonett Normed Fit Index (NFI), (c) Bentler-Bonett Nonnormed Fit Index (NNFI; also known as Tucker-Lewis Index), (d) Incremental Fit Index (IFI), and (e) Goodness-of-Fit Index (GFI).  Although a value of .90 for CFI, NFI, NNFI, IFI and GFI has served as a rule-of-thumb lower limit cutoff of acceptable fit, a value of .93 is expected of models considered to be well-fitting (Bryne, 1994). RMSEA values of less than .06 indicate a good fit, and values as high as .08 indicate a reasonable fit (Hu & Bentler, 1999).

## Confirmatory Factor Analysis Procedure

As reported earlier, the ISM is composed of 43 items with eight to12 indicators of each factor (see Table 1).  Bagozzi and Heatherton (1994) concluded that when there are more than four or five indicators per factor in a large sample, it is quite likely to lead to an unsatisfactory fit in the measurement model. To address this issue, I aggregated the items to form item "parcels" as indicators in the CFA. Parcels are formed by randomly combining two to four items in each scale (Bernardo et al., in press).   For the first factor of ISM composed of 11 items, the first item parcel was comprised by the following items: 1, 4, 7, and 10.  The second item parcel includes items 2, 5, 8, and 11 and the third parcel was composed of items 3, 6, and 9.   There were 11 parcels which were created:  3 parcels from 11 items of the first factor; 3 parcels from 12 items of the second factor; 2 parcels from 8 items of the third factor; and another 3 parcels from 12 items of the fourth factor. This procedure was conducted for the rest of the factors of the ISM.  Likewise, in the CFA analyses for ISM: Sense of Self and Facilitating Conditions Questionnaire (FCQ), this procedure was carried out.

In order to test the validity of the ISM scale, a CFA was performed with the following model.  Each of the four scales (mastery, performance, social, and extrinsic goals) for the ISM instrument, and another four scales (sense of purpose,

self reliance, negative self esteem, and positive self esteem) for ISM: SOS instrument as latent variables, and the manifest variables are the respective item parcels generated from the array of ISM items linked to the latent variables. Likewise, the four scales (latent variables) were correlated in the model.  Structural equation modeling (SEM) was used in this study to test the model in terms of how the hypothesized model fits to the observed data (Tabachnick & Fidell, 2001).  The STATISTICA 8 software was used for the entire statistical analysis.  As presented earlier, various goodness-of-fit indexes were used in this study.  They include: Chi-square ($\chi^2$), NNFI, CFI, GFI, and NFI.

## Results

Table 1 presents the various indexes of fit for the three measures considered in this study – the Inventory of School Motivation (ISM), Inventory of School Motivation:  Sense of Self, and the Facilitating Conditions Questionnaire (FCQ).

Table 1
Goodness-of-Fit Indices

| Model | $\chi^2$ | df | NNFI/TLI | CFI | GFI | NFI |
|---|---|---|---|---|---|---|
| ISM | 56.086 | 38 | 0.988 | 0.992 | 0.975 | 0.976 |
| ISM:SOS | 28.113 | 14 | 0.974 | 0.987 | 0.982 | 0.974 |
| ISM:FCQ | 154.889 | 85 | 0.967 | 0.982 | 0.956 | 0.961 |

*Note:* ISM=Inventory of School Motivation; SOS=Sense of Self Scale; FCQ=Facilitating Conditions Questionnaire; NNFI=Non-Normed Fit Index; TLI=Tucker-Lewis Index; CFI=Comparative Fit Index; GFI=Goodness-of-Fit Index; IFI=Incremental Fix Index; NFI= Bentler-Bonett Normed Fit Index.

## Confirmatory Factor Analysis (CFA) for Inventory of School Motivation (ISM)

As contained in Table 1, all of the fit indexes met the standard criterion for interpretation:  NNFI=.988, CFI=.992, GFI=.0.975, and NFI=.976.   These values are considered to be well fitting (Bryne, 1994).  The data were a good fit for the four-factor model (please refer to Figure 2).  Of all the goodness-of-fit indicators considered in this study, only the chi-square [$\chi^2$ (38) = 56.086, *p* < .0001; $\chi^2$/df = 1.48] was not adequate.  A significant value of $\chi^2$ suggests that entries for the proposed model deviate from those obtained.  On the other hand, a statistically nonsignificant value of $\chi^2$ suggests that a model may  be a reasonably satisfactory representation of the data.  As discussed by Anderson and Gerbing (1988), and Huang and Michael (2000), however, that the value of the chi-square likelihood ratio statistic is directly dependent on sample size.  Because of this, with large sample size, significant values can be obtained even though there are only trivial discrepancies between the model and the data.  On the other side, a small sample size would result in a decision to accept a model in spite of the presence of

substantial disagreement between the hypothesized entries for the model and those associated with data obtained.

**Figure 1**
Confirmatory Factor Analysis of 11 Parcels of Inventory of School Motivation (ISM) with 4 Factors
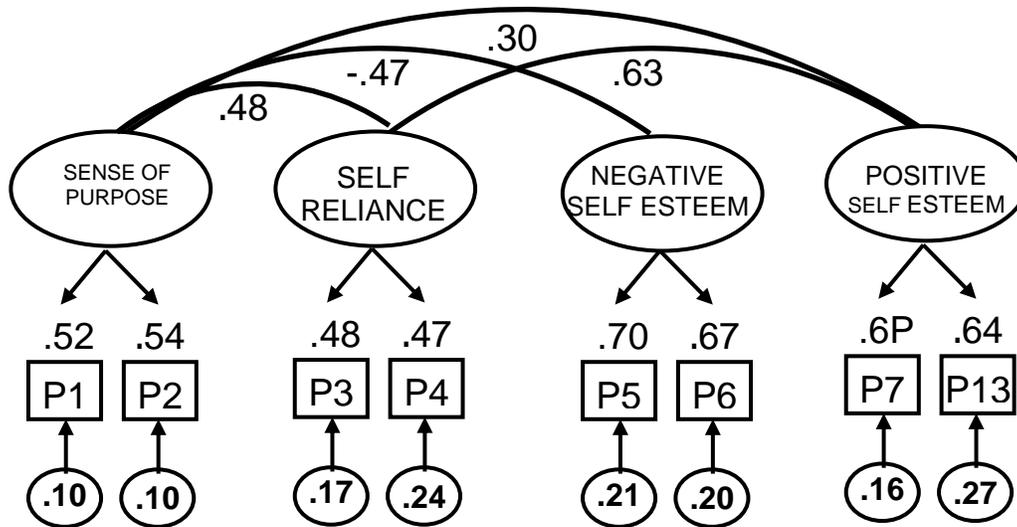


*Note.* Confirmatory Factor Analysis (CFA) for Inventory of School Motivation: Sense of Self Scale. Inter-Factorial Correlations Indicated are Significantly Different from Zero at *p*<.05

The fit of the Inventory of School Motivation: Sense of Self scale was likewise satisfactory. Although the value of $\chi^2$ was statistically significant, the entries of NNFI, CFI, GFI, and NFI were .97, .99, .98, and .97 respectively and were interpreted as well fitting. The data fits the 4-factor model of the Inventory of School Motivation.

Figure 2
Confirmatory Factor Analysis of 8 Parcels of Inventory of School Motivation: Sense
of Self with 4 Factors
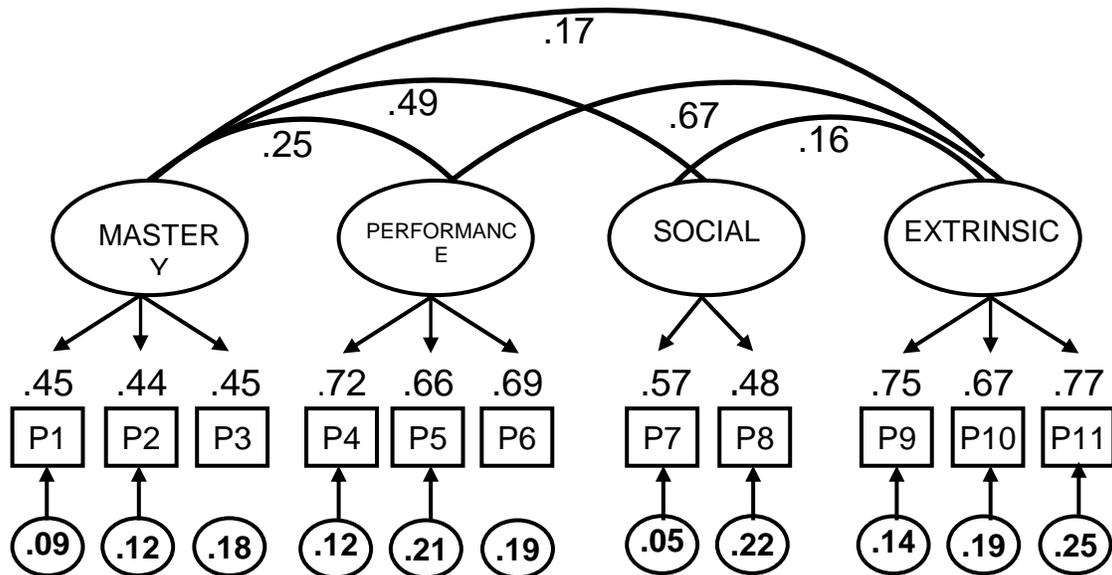


*Note*.      Confirmatory Factor Analysis (CFA) for Facilitating Conditions
Questionnaire Scale. Inter-Factorial Correlations Indicated are Significantly
Different from Zero at $p < .05$

     Like the results for the ISM and ISM: Sense of Self Scales, the data on a
separate CFA performed on the FCQ reflects that the data were a good fit with the
model (see Figure 4).   The data fit for the Facilitating Conditions scale was
satisfactory.   Although the value of $\chi^2$ was statistically significant, the entries of
NNFI, CFI, GFI, and NFI were .97, .98, .96, and .96 respectively and were
interpreted as well fitting.

Figure 3
Confirmatory Factor Analysis of 18 Parcels of Facilitating Conditions Questionnaire with 11. Inter-Factorial Correlations Indicated are Significantly Different from Zero at p<.05

.02 → P1 .60 ← UNIVERSITY INTENTION
.32 → P2 .65 ←

.72
.20

.02 → P3 .51 ← SCHOOL VALUING
.03 → P4 .57 ←
.02 → P5 .56 ←

.32
.30

.18 → P6 .67 ← PARENT SUPPORT
.08 → P7 .18 ←

37
.60

.03 → P8 .59 ← TEACHER SUPPORT
.03 → P9 .64 ←

40
.47
.31
.52

.04 → P10 .77 ← PEER HELP
.04 → P11 .81 ←

.57
.51
-.34
.65

1.21 → P12 .96 ← LEAVE SCHOOL

-.37
.66
.56
.18
.31

.04 → P13 .67 ← PRIDE FROM OTHERS

.75
.30
.39
.27

.04 → P14 .96 ← NEGATIVE PARENT INFLUENCE
.04 → P15 .95 ←

.48

.09 → P16 .50 ← AFFECT TO SCHOOL

.69

.00 → P17 .84 ← NEGATIVE PEER INFLUENCE

.45

-.30

.03 → P18 .66 ← POSITIVE PEER INFLUENCE
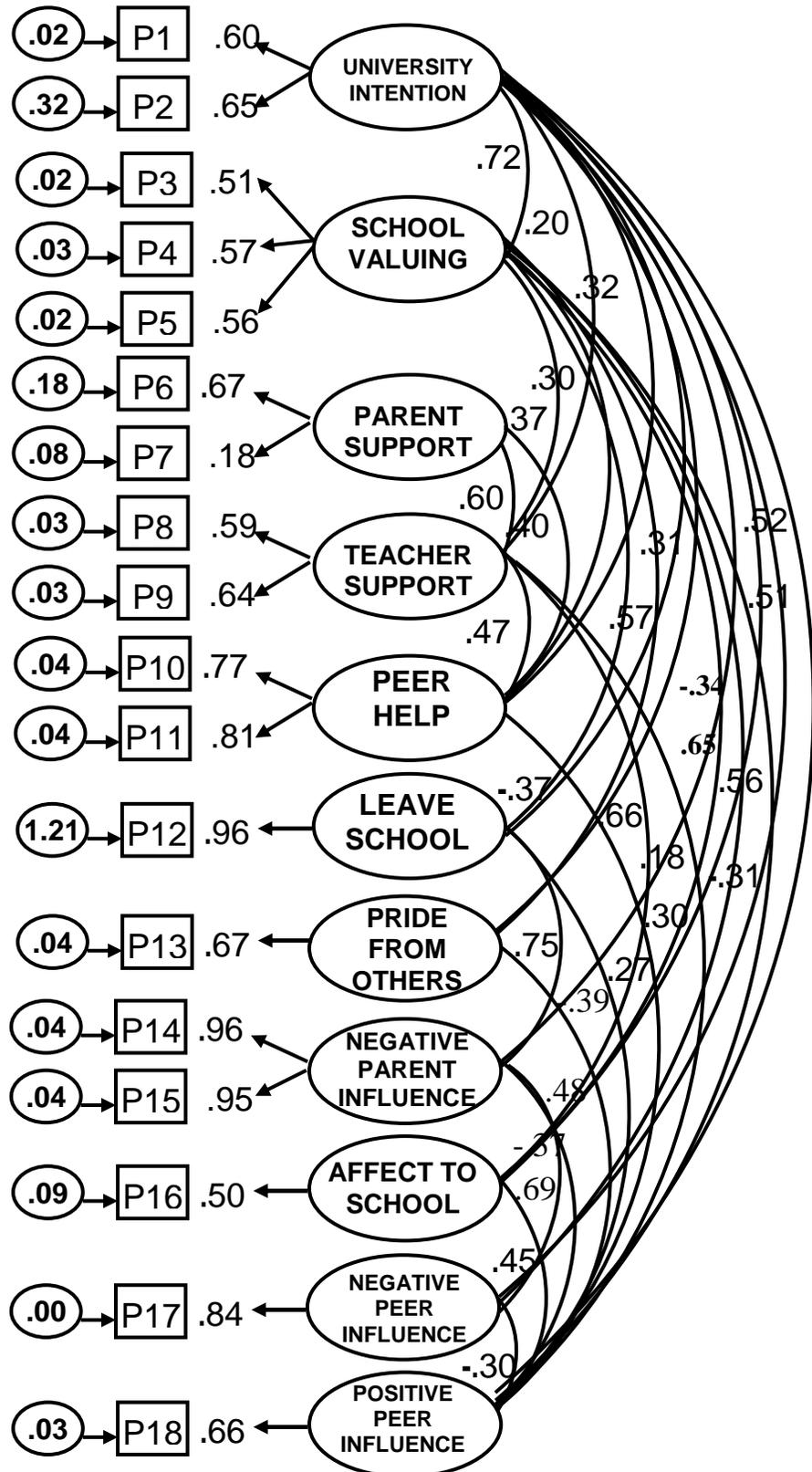
## Correlations among Latent Variables of Inventory of School Motivation (ISM)

Table 2 and Figure 2 reflect the data on the correlations of the 4 factors for the ISM scale.  The correlations among the factors of the ISM indicate that mastery goal is positively correlated with performance goal ($r$=.25); social goal ($r$=.49) and extrinsic goal ($r$=.17).  The same significant positive correlation happened between performance goal and extrinsic goal ($r$=.67) and between social goal and extrinsic goal ($r$=.16).

## Correlations among Latent Variables of Inventory of School Motivation:  Sense of Self Scales

The factors of Sense of Self questionnaire were correlated as well.  Among these four factors, sense of purpose has significant positive correlation with self reliance ($r$=.43) and positive self esteem ($r$=.25) but has significant negatively correlation with negative self esteem ($r$=-.24).  In addition to this, sense of reliance is positively correlated with positive self esteem ($r$=.50).

## Correlations among Latent Variables of Facilitating Conditions Questionnaire

The 11 factors of FCQ were also correlated with one another.  As expected, a pattern of results on the correlation coefficients can be traced from Table 4.  An example of this is between university intention and school valuing  ($r$=.72) where it may be inferred that those  students who may have clear  intention to complete college would tend to value school more than those who do not want to pursue college.   Conversely, negative parent influence is negatively correlated with university intention ($r$=-.27).  The complete correlation data on FCQ is contained in Table 4.

Table 2
Zero-Order Correlations among Latent Variables of Inventory of School
Motivation

| Inventory of School Motivation (ISM) Factors | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1.  Mastery Goal | - | | | |
| 2.  Performance Goal | .25* | - | | |
| 3.  Social Goal | .49* | .08 | - | |
| 4.  Extrinsic Goal | .17* | .67* | .16* | - |

*$p$<.05

Table 3
Zero-Order Correlations among Latent Variables of Inventory of School
Motivation (ISM): Sense of Self

| Inventory of School Motivation (ISM): Sense of Self Factors | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1.  Sense of Purpose | - | | | |
| 2.  Sense of Reliance | .43* | - | | |
| 3.  Negative Self Esteem | -.24* | -.04 | - | |
| 4.  Positive Self Esteem | .25* | .50* | -.02 | - |

*p<.05

Table 4
Zero-Order Correlations Among Scales/Latent Variables of Facilitating Conditions
Questionnaire (FCQ)

| Facilitating Conditions Questionnaire (FCQ) Factors | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.  University Intention | - | | | | | | | | | | |
| 2.  School Valuing | .72* | - | | | | | | | | | |
| 3.  Parent Support | .09 | .23* | - | | | | | | | | |
| 4.  Teacher Support | .20* | .37* | .60* | - | | | | | | | |
| 5.  Peer Help | .32* | .30* | .40* | .47* | - | | | | | | |
| 6.  Leave School | -.37* | -.35* | .23* | .16 | -.07 | - | | | | | |
| 7.  Pride From Others | .31* | .57* | .43* | .53* | .42* | -.14 | - | | | | |
| 8.  Negative Parent Influence | -.27* | -.37* | .01 | .01 | -.09 | .75* | -.29* | - | | | |
| 9.  Affect to School | .30* | .65* | .73* | .66* | .20* | -.07 | .53* | .05 | - | | |
| 10. Negative Peer Influence | -.31* | -.34 | .07 | .14 | -.01 | .84* | -.08 | .69* | -.15 | - | |
| 11. Positive Peer Influence | .52* | .56* | .08 | .18* | .27* | -.39* | .48* | -.37* | .45* | .30* | - |

*p<.05

## Internal-Consistency Estimates of Reliability

In this research, the internal consistency reliability estimates, the coefficient alphas ($\alpha$), for responses for **ISM** specific motivation scales ranged from $\alpha$.73 (social) to .88 (extrinsic). All these values surpass the generally accepted satisfactory level of .70 (Watkins, McInerney, & Boholst, 2003). Alphas for ISM Sense of Self Scales varied from .76 to .85 with positive self esteem having the lowest alpha of .76 and sense of purpose having the highest alpha of .85. The ISM Facilitating Conditions Questionnaire alike has factors coefficient alpha which surpassed the

satisfactory level of .70 with peer help obtaining the lowest alpha of .70 and positive peer influence having the highest coefficient alpha of .91.

Table 5
Alpha, Mean, and Standard Deviations of the Measures

| Inventory of School Motivation (ISM) | | | |
|---|---|---|---|
| Factors | Alpha (α) | M | SD |
| 1. Mastery Goal (11 items) | .81 | 1.90 | .49 |
| 2. Performance Goal (12 items) | .86 | 3.03 | .73 |
| 3. Social Goal (8 items) | .73 | 2.11 | .56 |
| 4. Extrinsic Goal (12 items) | .88 | 2.70 | .77 |
| Inventory of School Motivation: Sense of Self Scales | | | |
| 1. Sense of Purpose (6 items) | .85 | 1.63 | .58 |
| 2. Self Reliance (8 items) | .84 | 3.66 | .86 |
| 3. Negative Self Esteem (7 items) | .79 | 3.31 | .73 |
| 4. Positive Self Esteem (5 items) | .76 | 2.75 | .71 |
| Facilitating Conditions Questionnaire (FCQ) | | | |
| 1. University Intention (5 items) | .88 | 1.54 | .65 |
| 2. School Valuing (9 items) | .88 | 1.60 | .58 |
| 3. Parent Support (6 items) | .88 | 2.75 | .95 |
| 4. Teacher Support (6 items) | .77 | 2.47 | .67 |
| 5. Peer Help (5 items) | .70 | 2.17 | .82 |
| 6. Leave School (4 items) | .90 | 4.08 | 1.05 |
| 7. Pride From Others (4 items) | .84 | 2.13 | .82 |
| 8. Negative Parent Influence (5 items) | .90 | 4.09 | .97 |
| 9. Affect to School (3 items) | .76 | 2.32 | .80 |
| 10. Negative Peer Influence (4 items) | .84 | 1.82 | .75 |
| 11. Positive Peer Influence (4 items) | .91 | 3.88 | 1.04 |

## Discussion

This study examined the factor structures of scores on the    43-item Inventory of School Motivation (ISM); 26-item Sense of Self Scales; and 55-item Facilitation Conditions Questionnaire (FCQ) which were all constructed by Dennis M. McInerney and group.   It also examined the estimates of internal consistency and construct validity of the said instruments.

The results, with the 378 sample Filipino high school students, indicate that confirmatory factor analyses conducted for the ISM, Sense of Self, and FCQ scales indicated a good fit between the models and the data using the goodness-of-fit index.   Thus, the CFA approach used in this study provided a strong validation, with the Filipino sample, of the Inventory of School Motivation (ISM), Inventory of School Motivation: Sense of Self, and Facilitating Conditions Questionnaires

constructs.  Specifically, the data were a good fit for the four-factor model of ISM, four-factor of Sense of Self scale, and eleven-factor Facilitating Conditions Questionnaire.

The internal reliability of the complete ISM, Sense of Self items, and FCQ scales were adequate reaching acceptable levels, with Cronbach alpha values meeting the criterion.  These results provided us with confidence that these instruments may yield valid scores in the Philippine setting even if these have been used mostly in Western countries.

In comparison with the previous work of Watkins, McInerney, and Boholst (2003) involving 86 fourth year Filipino students on the validity and reliability of ISM where they found that reliance, self esteem and task not meeting the satisfactory level based on coefficient alpha, the present study revealed otherwise. In this study, the 3 mentioned factors of ISM obtained .84, .79 and .81 alpha coefficients respectively.

Reflecting on the results, the present findings of the CFA conducted on Inventory of School Motivation (ISM) are somehow supported with the studies conducted by Bernardo involving Filipino students (see Bernardo, 2003; 2004; 2005; 2007 for a review).   Specifically, in some of his studies in the Philippines, it was revealed that both mastery and performance-approach goals tend to be associated with positive learning variables such as deeper learning strategies (Bernardo, 2004) and higher achievement (Bernardo, 2005); and that  interestingly, there is a significant positive association between mastery and performance goals (Bernardo, 2003), which may indicate either that the students are adopting multiple goals, or that the Filipino students are giving different meanings to these two types of goals.  Somehow these empirical studies on the learning goals of Filipino students provided theoretical support on the applicability of the ISM constructs to Filipino students.

On the other hand, the result of CFA conducted on FCQ in this study is supported by the previous study of McInerney, Dowson, and Yeung (2005) involving elementary and high school students with Anglo background in the United States.  This might connote that somehow the factor structures of the external facilitating conditions and support of students in the Philippines might be somewhat related, if not completely synonymous, with the group of students studied by McInerney, Dowson, and Yeung (2005) in United States particularly in Phoenix, Arizona.

In the Philippines, although there are not many available empirical studies on the impact of external support: social and environmental, provided for the Filipino students vis-à-vis motivation and academic performance, however literature are rich on the effect of significant others – facilitating conditions – on the translation of internal motivations into actual behavior and performance.   Some research have demonstrated the relationship between students' perceptions of support and caring from parents, teachers, and peers and aspects of their motivation and academic achievement (Allocca & Muth, 1982; Bempechat, 1990). Research also indicates that the parental involvement in the education of their children is a good predictor of student learning and success (Fantuzzo, Tighe, & Childs, 2000; Hill, 2001; Hill & Craft, 2003).  On the part of facilitating conditions provided by peers, the quality of peer interactions can have a substantial bearing on

students' academic performance and social behaviors (Fredricks, Blumenfeld, & Paris, 2004).

With all these, the validation of these scales becomes useful for researchers and even teachers, school psychologists and even counselors. This validation study ascertained the psychometric properties of a foreign-made test when applied to the Philippine setting. Hence, the mentioned professionals can now use the Inventory of School Motivation, Sense of Self Scale and Facilitating Conditions Questionnaire to better understand the uniqueness of Filipino high school students.

The completion of this instrument validation suggests various possible research explorations in the future involving bigger Filipino participants. It will be interesting to explore the variations of students' achievement motivations and the facilitating and/or inhibiting support system accorded to the Filipino students from different groups of divergent cultural backgrounds by their social network-parents, teachers, and peers among others. To find out how these facilitating conditions impact students' school motivation and learning, and to identify if such conditions are translated into academic outcome are objectives worth realizing. Moreover, another research area which can be considered using mixed-methods research design is the investigation of the achievement goals of Filipino students in comparison with Chinese, Chinese-Filipino, and Korean students who are growing in number rather quickly in the landscape of Philippine classrooms. The quantitative phase of possible study might be to explore whether the goals held by these students from diverse cultural backgrounds differ and to determine the relationship of these goals to school motivation and achievement. In order to attain deeper understanding of the quantitative results, the second phase might be the utilization of focus group discussions with students and parents. This can be a way of probing and/or triangulating the data within which to account for the valid explanation of quantitative results. A separate comparative study on the psychometric properties of the possible Filipino version of the ISM and FCQ in order to account for cross-cultural response bias can also be equally interesting. All these may be made possible now that the ISM, Sense of Self and FCQ constructs have been found valid and useful instruments within which to explore goals, sense of self measures and facilitating conditions of students in the Philippine classrooms.

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