Initial Validation of a Measurement Scale Assessing Chinese Business Students' Orientation Towards Corporate Social Responsibility in Hong Kong

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1. Executive Summary

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+ Business decisions affect many aspects of our living. Since business students will be future business decision-makers, hence it is pertinent to nurture their business ethicality.

+ Social ethicality is regarded a key learning outcome of GE (Association of American Colleges & Universities, n.d.; Wells, 2016); and corporate social responsibility (CSR) as a manifestation of business ethics becomes a valid GE topic.

+ Deans of business schools in the U.S. ranked the teaching and learning of ethics as one of the most important learning goals of their programs (Martell & Calderon, 2005; Evans & Weiss, 2008).

+ A recent benchmark of seven local UGC-funded universities revealed that all of them have some form of business ethics (BE) or CSR components in their curriculum, either as a business or GE course, which was taught in different ways.

+ In order to assess effectiveness of educational means in developing students' orientation towards CSR (CSRO), a relevant and valid measurement scale has to be found first.

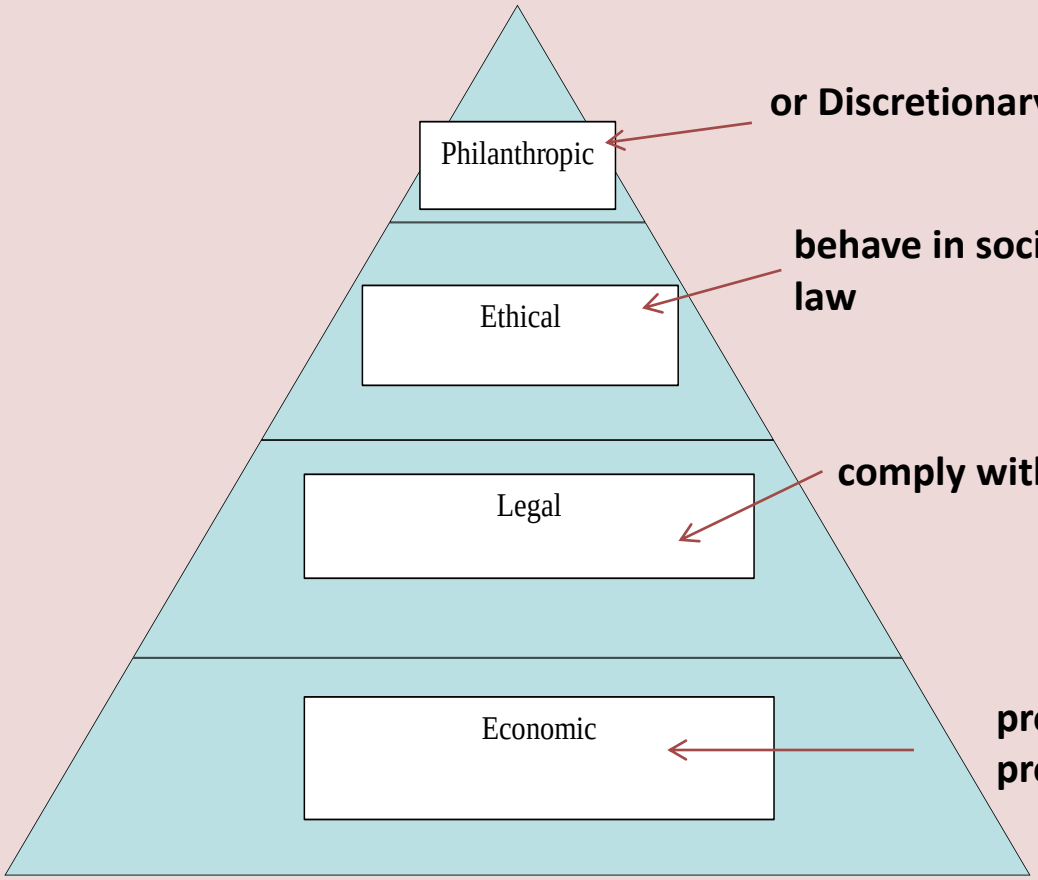
+ This study translated a well established measurement scale E-CSRO into Chinese (C-CSRO) and initially tested with N=793 Chinese sub-degree business students.

+ Data were tested on items reliabilities, correlations Pearson *r*, Exploratory Factor Analysis and Confirmatory Factor Analysis.

+ Overall results confirm validity of C-CSRO and the convergence in its psychometric properties to E-CSRO when applied to a Chinese student sample.

2. Conceptual / empirical basis for this study

2.1 The CSR Pyramid (Carroll, -1979, 1991)



or Discretionary, engage in charitable activities

behave in socially commendable manner, beyond the law

comply with legal requirements

produce goods and services at a profit

Figure 1 The CSR Pyramid

Source: A. B. Carroll, "The Pyramid of Corporate Social Responsibility: Toward the Moral Management of Organizational Stakeholder", *Business Horizon* (July-August, 1991), 39-48.

2.2 E-CSRO – sample questions

Aupperle et al.'s original E-CSRO - instruction and sample questions

Based on the relative importance and application to your firm, allocate up to, but not more than, 10 points to each set of four statements. For example, you might allocate points to a set of statements as follows:

A = 4	***A = 1***	***A = 0***
B = 3	***B = 2***	***B = 4***
C = 2 ***or***	***C = 0*** ***or***	***C = 3***
D = 1	***D = 7***	***D = 0***
Total = 10 points	***Total = 10 points***	***Total = 7 points***

Question 1

It is important to perform in a manner consistent with:

(Economic) *A. expectations of maximizing earnings per share*

(Legal) *B. expectations of government and the law*

(Discretionary) *C. the philanthropic and charitable expectations of society*

(Ethical) *D. expectations of societal mores and ethical norms*

Question 2

It is important to be committed to:

(Economic) *A. being as profitable as possible*

(Discretionary) *B. voluntary and charitable activities*

(Legal) *C. abiding by laws and regulations*

(Ethical) *D. moral and ethical behavior*

3. Research aim and objectives

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Aim

+ To establish a reliable and valid measurement instrument so as to facilitate research that assesses CSRO of individuals in the Chinese community, especially where English is not the first language.

Objectives

+ Convert a well-established measurement scale E-CSRO into Chinese (C-CSRO)

+ Investigate the underlying constructs, psychometric properties; and replicability of the measurement scale C-CSRO with Chinese business student samples.

+ Establish initial validity of C-CSRO as compared to its source instrument.

4. Method

4. Method

4.1 Translation procedure to convert E-CSRO into C-CSRO

+ Enlightened by good practices in cross-cultural translation (Brislin, 1970; J. S. Carroll, Holman, Sergura-Bartholomew, Bird & Busby, 2001; Lee, Li, Arai & Puntillo, 2009; Prieto, 1992), the translation process involved the following approaches:

+ A forward and backward translation process weaved through the procedures that is based on a reiterative and serial approach.

+An interactive and committee approach using team work among the translators, reviewers and back-translators

+ Employing individuals with suitable qualification to take up the roles of translators, reviewers and back-translators.

4.Method

4.1 Translation procedure to convert E-CSRO into C-CSRO

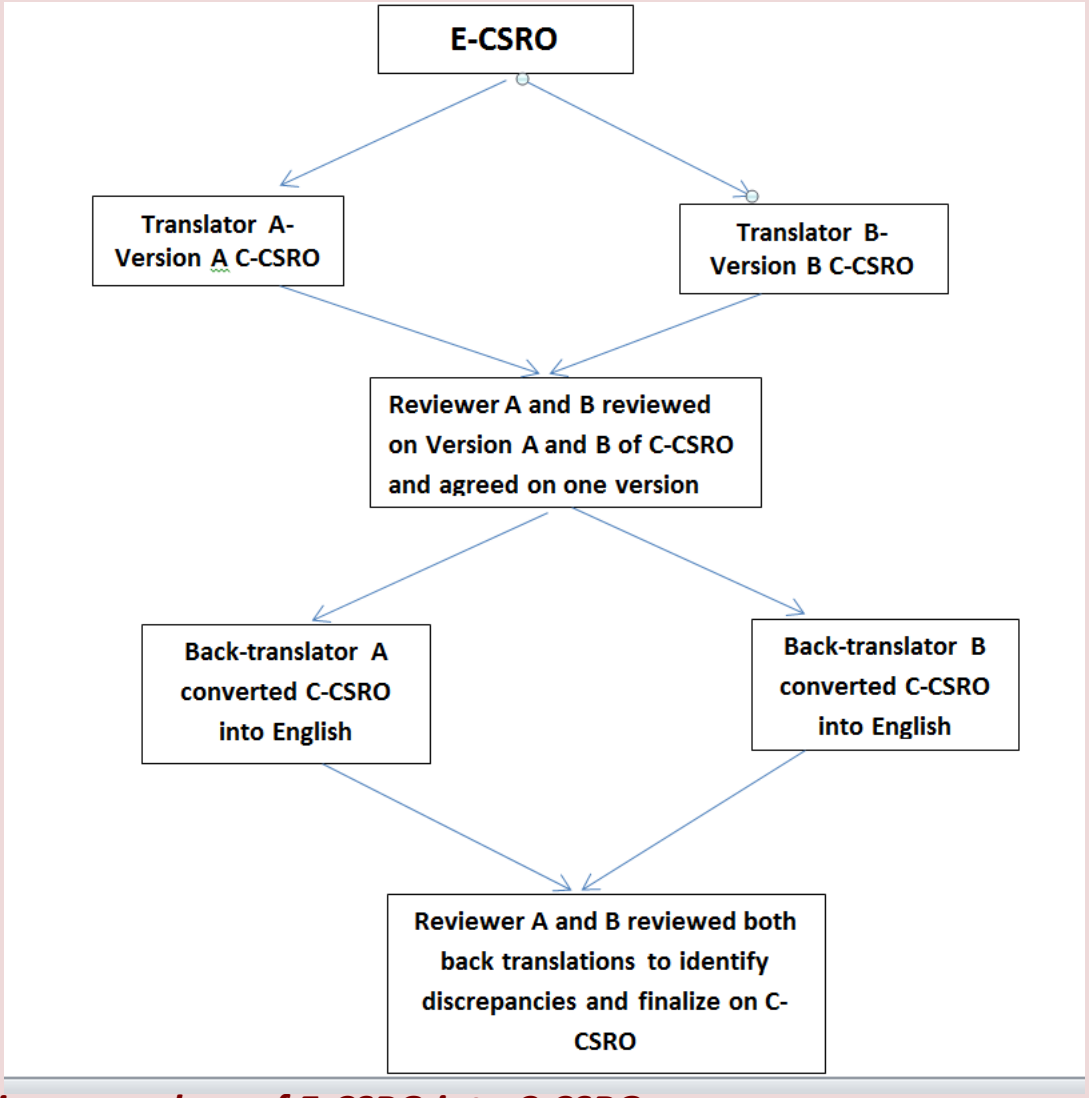

Figure 2 Translation procedure of E-CSRO into C-CSRO

4. Method

4.2 Participants and Procedures in Data Collection

+ C-CSRO was first applied to a focus group for discussion with N=8 students majored in a sub-degree programme of corporate communications.

+ After that a pilot survey was conducted with N=133 business sub-degree students.

+ Lastly C-CSRO was administered to some year 1 and 2 students who had enrolled with an Associate in Business program of the Hong Kong Community College.

+ N=793 valid convenience samples were collected and subjected to statistical tests.

4.3 Statistical Methods

+ Using SPSS V. 21, data were tested on its reliability and items correlational strength.

+ Then subjected to Exploratory Factor Analysis (EFA) using Principal Component Analysis (PCA) as data extraction and Varimax as data rotation method.

+ Using AMOS Version 21 (Arbuckle, 2012) Confirmatory Factor Analysis (CFA) with Maximum Likelihood (ML) as the estimation procedure was performed.

5. Results

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5.1 Descriptive, Reliability and Correlational Statistics

Data Screening

+Skewness and kurtosis of the C-CSRO data were examined and supported data normality.
+Mahalanobis d-squared singled out four outliers, each case was reviewed and no unreasonableness was found in the response.

+Kaiser-Mayer-Olkin (KMO) test results are .709, satisfied the recommended value (Kaiser, 1974).
+Bartlett Test of Sphericity results are chi square = 24049.681, df = 1326, and significance p value is $p < .001$ which supported data adequacy for factor analysis (Barlett, 1954).

Table 1 Mean and Standard Deviation

	Mean	Std. Deviation
Economic	2.755	1.1822
Legal	2.449	.6653
Ethical	2.420	.7129
Discretionary	1.651	.6472

Note. Valid N (listwise)=793

5.1 Descriptive, Reliability and Correlational Statistics

- C-CSRO has 52 item variables. Cronbach alphas demonstrates high internal consistencies with Economic at 0.921, Legal 0.833, Ethical 0.805, and Discretionary 0.849.

- When Cronbach Alphas ≥.9 internal consistency could be interpreted as excellent, when ≥ .8 as good (George & Mallery, 2003); when testing a modified instrument Alpha coefficient > .60 can be regarded as satisfactory (Flaherty et al., 1988)

- Correlation Pearson *r* between Economic and the three non-economic dimensions are distinct and negatively correlated from -.42 to -592. Those between the non-economic dimensions are relatively weak. This can be explained by the similar and conceptually overlapping nature of Ethical, Legal and Discretionary which are likely to compete for scores.

Table 2 Correlations of C-CSRO

	Economic	Legal	Ethical	Discretionary
Economic	1	-.420**	-.592**	-.465**
Legal		1	.191**	-.102**
Ethical			1	.159**
Discretionary				1

**. Correlation is significant at the 0.01 level (2-tailed). Listwise N=793

- All item correlations of C-CSRO are significant with p value < .05 and Pearson

5.2 Scree Plot Test

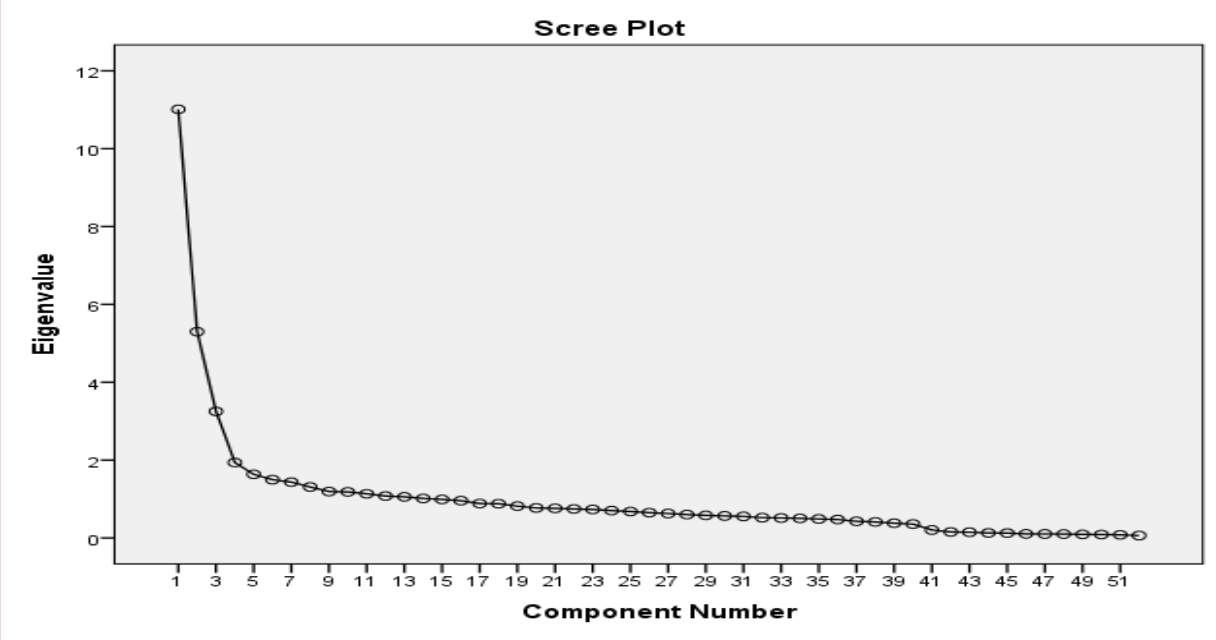


Figure 3 Scree Test of C-CSRO

+ Starting from the fifth factor there was a clear twist in the slope.

+ The first four factors have an initial Eigenvalue > 1 that altogether explained 41.346 % of the total variance of the item scores

5.3 Exploratory Factor Analysis

Table 3 Rotated Component Matrix of C-CSRO

	Component			
	1	2	3	4
13C Economic	.810	-.017	-.102	-.068
10D Economic	.759	-.081	-.092	-.052
12D Economic	.751	-.071	-.075	-.024
11A Economic	.738	-.038	-.029	-.104
9B Economic	.699	-.152	-.152	-.097
6A Economic	.672	-.253	-.255	-.226
7C Economic	.669	-.174	-.212	-.130
5B Economic	.609	-.142	-.185	-.209
4A Economic	.544	-.228	-.317	-.361
2A Economic	.504	-.265	-.300	-.448
3B Economic	.474	-.270	-.222	-.364
1B Legal	-.149	.715	-.113	-.028
3A Legal	-.123	.691	-.144	.173
6B Legal	-.145	.674	-.079	-.067
2C Legal	-.081	.674	-.060	-.051
4B Legal	-.016	.632	-.067	-.009
9C Legal	-.243	.466	-.013	.062
7B Legal	-.253	.437	.013	-.034
1C Discretionary	-.169	-.157	.769	-.015
3C Discretionary	-.132	-.106	.735	.093
2B Discretionary	-.128	-.105	.720	-.073
6D Discretionary	-.219	-.065	.621	.020
4C Discretionary	-.149	-.006	.502	.103
1D Ethical	-.166	-.037	-.042	.794
2D Ethical	-.219	-.061	-.080	.729
4D Ethical	-.114	-.092	.119	.541
1A Economic	.467	-.304	-.382	-.520
6C Ethical	-.308	.092	.032	.426
13D Discretionary	-.238	-.083	.398	-.034
5A Discretionary	-.084	-.005	.407	.149
13A Ethical	-.404	.079	-.095	.215

5.3 Exploratory Factor Analysis

Similar to what Aupperle, Hatfield and Carroll (1983) had adopted, Principal Component Analysis (PCA) and Varimax Rotation were used to extract the components with correlation coefficient ≥ .4.

component one - 12 variables loaded on the *economic* dimension

component two - 7 variables loaded on the *legal* dimension

component three - 7 variables loaded on the *discretionary* dimension, one of the factor loading is .398, very close to .4

component four - 4 variables loaded on the *ethical* dimension

5.4 Confirmatory Factor Analysis

The C-CSRO CFA Model has 13 questions and under each there are 4 statements represent one of the four CSRO of Economic, Legal, Ethical and Discretionary respectively.

So there are 4x13 = 52 observed variables and they loaded on the four CSRO variables as follows:

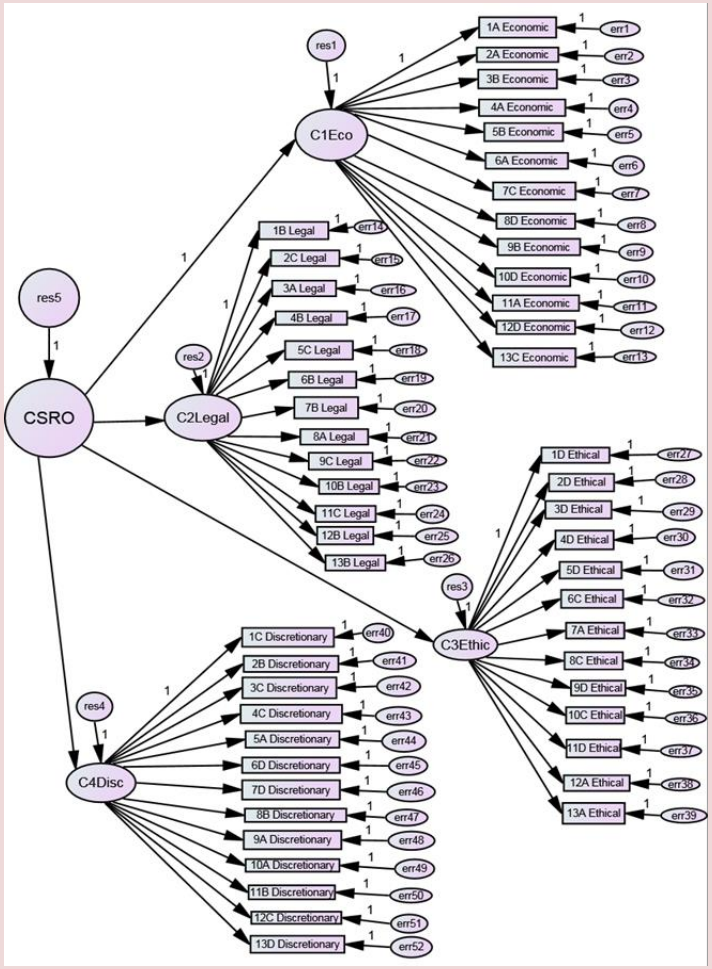
1A, 2A, 3B, 4A, 5B, 6A, 7C, 8D, 9B, 10D, 11A, 12D, 13C load on factor **C1Econ**
1B, 2C, 3A, 4B, 5C, 6B, 7B, 8A, 9C, 10B, 11C, 12B, 13B load on factor **C2Legal**
1D, 2D, 3D, 4D, 5D, 6C, 7A, 8C, 9D, 10C, 11D, 12A, 13A load on factor **C3Ethical**
1C, 2B, 3C, 4C, 5A, 6D, 7D, 8B, 9A, 10A, 11B, 12C, 13D load on factor **C4Disc**

+ A trial run on CFA returned with some dissatisfactory fit statistics with Chi-square = 12454.035; degrees of freedom = 1270, probability level = .000.; RMSEA 0.105 and CFI 0.519.

+ According to Burton, Hegarty and Farh (2000) “CFA with many indicators per latent factor often does not converge and tends to produce a poor fit even when the model is relatively accurate. The usual practice is to reduce indicators by averaging several items and then use the averages as new indicators for the latent constructs …….. This procedure resulted in four indicators for each type of responsibility” (p.157).

+ In other words, a ***parceling strategy*** was adopted (Hoyle, 2012).

5.4 Confirmatory Factor Analysis



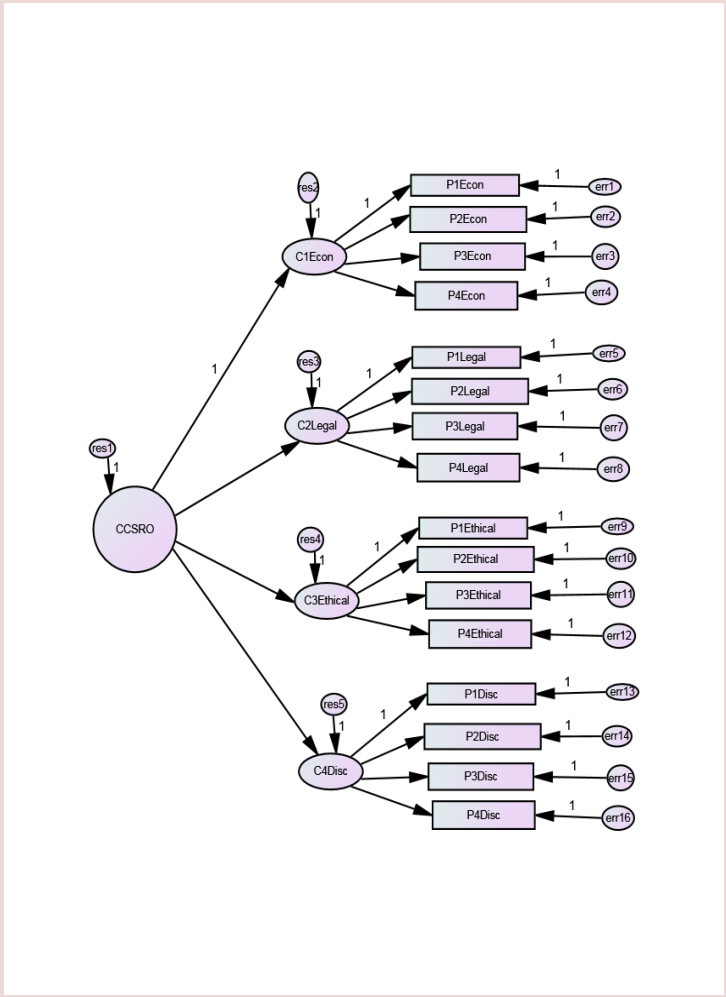


Figure 4 The C-CSRO Model Before Parceling

Figure 5 The C-CSRO Model After Parceling

After parceling, observed variables were reduced to 16 with 36 distinct parameters to estimate.

5.4 Confirmatory Factor Analysis

- The C-CSRO model has [16(16+1)/2] -36= 100 degrees of freedom and Chi-square = 606.05 $p < .001$.

- In general a Chi-square/df ratio about 5.0 is regarded as reasonable.

- In this case Chi-square is significant and Chi-Square/df ratio = 6.06, p value $< .05$. By convention the null hypothesis that the model fits the data on a global basis should be rejected and multi-faceted statistics were consulted.

Absolute and Incremental fit indices of the C-CSRO Model

- GFI =.921; >9 indicates acceptable fit (Bentler & Bonnett, 1980) or good fit (Meyers, Gamst & Guarino, 2013)
- RMSEA =.08; =.08 implies adequate fit (Browne & Cudeck, 1993)
- CFI= .934; TLI=.921 and NFI=.922; .90 supports reasonably sufficient fit (Bentler & Bonett, 1980)
- SRMR= .0679; < .08 suggests model good fit (Hu & Bentler, 1999)

5.4 Confirmatory Factor Analysis

+ Standardized regression weights of C1Econ(Economic) - 1.605; C2 Legal -.310; C3 Ethical -.388 and C4Disc -.346. When standardized paths >.30 is considered meaningful (Chin, 1988).

+ Squared Multiple Correlations in this case ranged from .096 to 2.577, when > 10% is considered to have a large effect size (Davis, 2013)

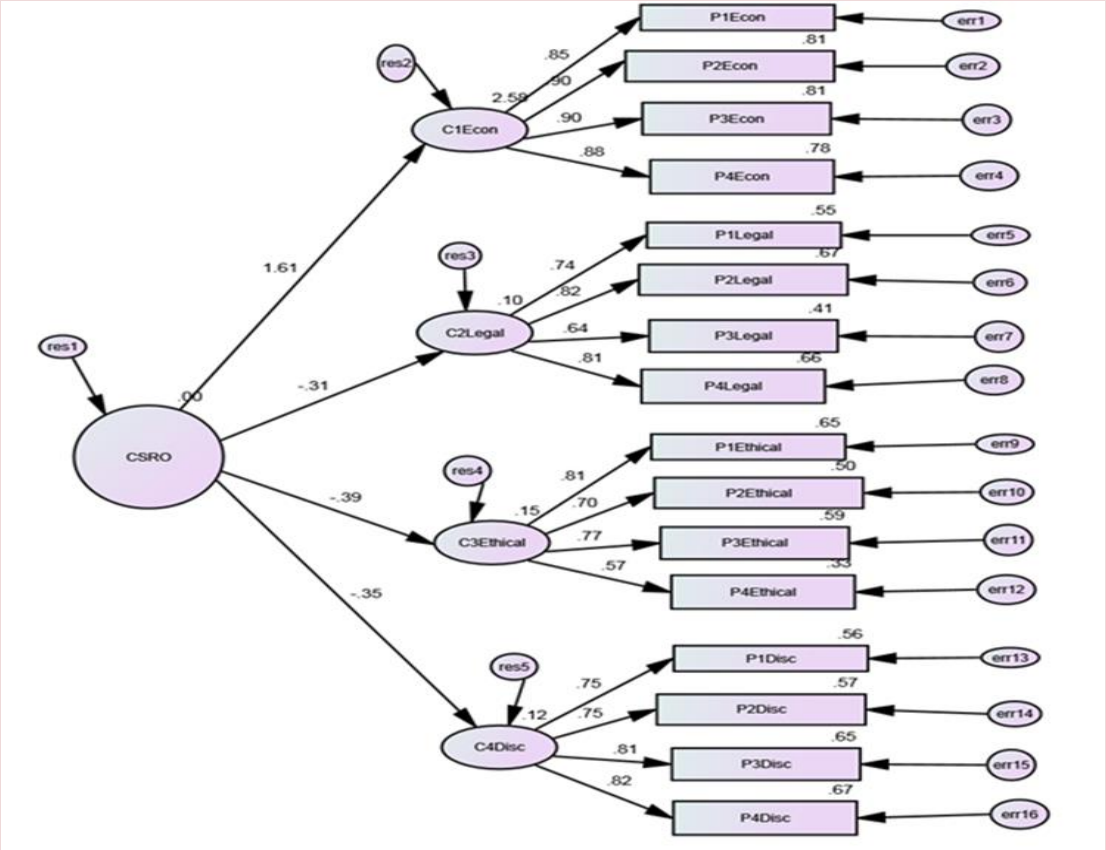


Figure 6 Hypothesized factorial structure of the C-CSRO Model

6. Caveats, Discussions and Conclusion

6.1 Caveats

- It is difficult to eliminate all inadequacies and non-equivalence in cross-cultural translation.
- Owing to practical constraints, convenience samples were used
- CFA itself operates upon a model laden pre-requisite which may draw on heuristic views. So seemingly reasonable conclusions can stem from some restrictive theoretical assumptions.
- Despite of these challenges, anticipated benefits of obtaining a Chinese measurement scale in assessing C-CSRO justified the efforts to contain the problems.

6.2 Discussion

- In order to assess the effectiveness of general educational endeavors in developing CSRO of students, a valid measurement instrument that can capture and gauge individual's CSRO is needed.

- A. B. Carroll conceptualized the broad notion of CSR into a four dimensional construct; upon which Aupperle (1982) initiated a robust measurement scale (E-CSRO) to assess a person's CSRO.

- The Western world has pioneered in studying the concept of CSR and CSRO, whereas measurement scale in Chinese that assesses a person's CSRO is relatively scant.

- In view of this a Chinese measurement scale is needed that can facilitate CSRO study not only in a Chinese community but has the potential to enable cross-cultural studies in this area.

6.2 Discussion

+ This study translated E-CSRO into a Chinese scale (C-CSRO) and tested its validity among some Chinese students.

+ The test results of C-CSRO showed :

  + High items reliability supporting clear item homogeneity.

  +Acceptable and explainable correlational Pearson *r* statistics

  + Factor analytic tests using EFA yielded four discrete factor structure predominated by the dimensions of Economic, Legal, Ethical and Discretionary that corresponded with a priori theory, Carroll's (1979) CSRO constructs.

† These results in fact align with the original findings by Aupperle (1982), Aupperle et al. (1983) when E-CSRO was first validated.

+ CFA outcome supported adequate model fit of C-CSRO; its factor structure, construct interrelatedness was replicable in the Chinese sample

6.3 Conclusion

+ Overall C-CSRO can be regarded as having attained equivalence and validity in its psychometric properties that is convergent to its English version (E-CSRO).

+ C-CSRO is useful and suitable in assessing CSRO of business students in a Chinese community.

+ Presently a preliminary attempt to validate C-CSRO was performed.

+ To enhance the predictability of C-CSRO future research can include:

  + using split samples for cross- validation by EFA and CFA;

  + replicate the tests to other Chinese population segments e.g. non-business students and conduct cross-groups validation.

  + examine the psychometric properties of C-CSRO in the light of other variables e.g. business programmes and ethical propensity of the person.

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