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Measuring Public Service Motivation:

Developing an Instrument for International Use

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Introduction

As the scholarly research on public service motivation (PSM) has grown and the geographic scope of the research has expanded, some scholars have questioned whether different PSM measures are equivalent or we need to develop a more appropriate measure of PSM that can be used consistently and confidently (Wright, 2008). The search for a more universal approach is demanded. It is important to assure that a measure of PSM can be used confidently for doing cross-national research and comparison.

A survey-based measure for PSM developed by Perry (1996) has been useful for facilitating comparisons across disparate services and national settings, informing research in other disciplines, and creating foundations for cumulating results (Perry, Hondeghem and Wise, 2010). Perry's (1996) 24-item scale is composed of four subscales: attraction to public policy making; commitment to civic duty and the public interest; compassion; and self-sacrifice. Close attention to the measurement of PSM has yielded efficient accumulation of knowledge about its antecedents and consequences, but the previous research has employed multiple measures of PSM, and only eight studies among 19 studies using Perry′s (1996) scale analyzed four-dimensions (see Kim, in press). Thus, the results of empirical analyses are not fully comparable across studies.

In order to facilitate research internationally, the PSM construct is improved conceptually and operationally. Kim and Vandenabeele (2010) have proposed that public service motives are based on self-sacrifice and can fall into three categories; instrumental, value-based, and identification motives. The instrumental motives are related to behavior, the value-based motive to value and ethics, and the identification motives to attitude. The dimensions of the PSM construct are refined as attraction to public participation, commitment to public values, compassion, and self-sacrifice. The relationships between PSM and its dimensions show that it is more reasonable to define PSM as a formative construct: PSM has formative dimensions, and each dimension has several reflective items; researchers should include all of the dimensions that form PSM in the study (Kim, in press; Kim and

Vandenabeele, 2010; Wright, 2008). Thus, we believe future research should turn to further improving measurement. Developing a more appropriate measure of PSM that can be used consistently and confidently is essential for future research.

This study is to develop a revised measurement instrument of PSM for international use. The next section of this paper will review the recent studies on the construct and measures of PSM. Then the processes for developing the measurement instrument of PSM for international use are explained. After developing the possible items of PSM, the international survey results are analyzed and discussed in order to confirm the factor structure and validate the items of PSM.

Public Service Motivation

PSM is about the motives people have for behavior (Wise, 2000). In general terms, PSM is thought of as "an individual's orientation to delivering services to people with a purpose to do good for others and society" (Perry and Hondgehem, 2008a: vii). Although the definitions of PSM vary among authors (Perry and Wise, 1990; Rainey and Steinbauer, 1999; Vandenabeele, 2007), there is a common focus on motives and action that are intended to do good for others and shape the well-being of society (Perry and Hondeghem, 2008b). PSM is an individual, not a sector-specific, concept (Brewer and Selden, 1998), which prevails in the public sector, but it is different from public *sector* motivation or public *employee* motivation (Brewer, 2002; Pandey, Wright and Moynihan, 2008; Perry and Hondeghem, 2008b). Public service motives may be found in any sector of employment (Wise, 2000). Public service–motivated employees in the private sector may engage in positive extra-role behavior, especially when they perceive the organizational culture to underline values that fit in with their concern for others and for society at large (Steen, 2008). Therefore, PSM can be found among individuals in both the public domain and the private sector (Perry and Hondeghem, 2008a).

PSM is a multidimensional construct with an overarching meaning (Perry and Hondeghem, 2008b). Building upon the research of Knoke and Wright-Isak (1982), Perry and Wise (1990) proposed that PSM was associated with three types of motives: affective, norm-based, and rational. These three types of motives are the foundation for the distinct dimensions of PSM. An individual may have rational, norm-based, and affective motives that contribute to a single behavior (Brewer, Selden and Facer II, 2000). These three categories provide a useful framework for understanding PSM,

but they also have limitations: First, the rational motives consider the possibility of self-interested motives (Wise 2000; Wright and Pandey 2008); and these three types of motives do not distinguish between normative and affective motives conceptually (Wright and Pandey, 2008). Thus the construct of PSM needs to be improved conceptually in order to facilitate international research.

The construct of PSM was sharpened by Kim and Vandenabeele (2010); they proposed that PSM is associated with three types of motives: instrumental, value-based, and identification. The value-based motives concern terminal public values (Bozeman 2007; Jørgensen and Bozeman, 2007) that individuals want to achieve through their behaviors and actions. The identification motives concern people, groups, or objects that individuals want to serve. Affective bonding with others is the emotional basis of behavior for serving others (Knoke and Wright-Isak, 1982). The instrumental motives concern the means to perform meaningful public service. These three refined motivational components are focused on value (for what), attitude (for whom) and behavior (how): the value-based motives are related to values and ethics, the identification motives to attitude, and the instrumental motives to behavior. For satisfying the instrumental, value-based, and identification motives of public service, individuals may be willing to sacrifice some private interests and to accept less monetary rewards, while giving more effort and commitment to public service. Thus self-sacrifice is a foundation of realizing public service motives (Batson and Shaw, 1991; Piliavin and Charng, 1990). Based on self-sacrifice, individuals are likely to perform acts that are intended to do good for others and shape the well-being of society as a way of satisfying their personal needs. The greater the strength of one's PSM, the more likely he or she is to engage in behaviors that benefit the public, even with the loss in tangible individual rewards (Wise, 2000).

A measurement scale for PSM was developed by Perry (1996); he identified the four empirical components of the PSM construct of attraction to public policy making, commitment to the public interest/civic duty, compassion, and self-sacrifice. A significant number of researchers using the dimensions of Perry's (1996) scale have examined the antecedents and effects of PSM. However, previous studies show that the four dimensions of PSM have limitations. In some cases, dimensions were left out of the analysis because they were ill-fitting (Castaing, 2006; Coursey and Pandey, 2007a; DeHart-Davis, Marlowe and Pandey, 2006; Moynihan and Pandey, 2007a, 2007b; Wright and Pandey, 2005, 2008), whereas in other cases additional dimensions were created to cover the full extent of what PSM conceptually meant in a given environment (Gianque et al., 2009; Vandenabeele, 2008b).

Such diversity will limit the ability to replicate and build upon previous findings (Wright, 2008). Accordingly the dimensions of PSM were refined in order to better explain and predict public service–related behavior cross-nationally by Kim and Vandenabeele (2010). First, the dimension of attraction to policy making was refined as the dimension of attraction to public participation, and second, the dimension of commitment to public interest was refined as the dimension of commitment to public values. Thus, the dimensions of the PSM construct were refined as attraction to public participation (APP), commitment to public values (CPV), compassion (COM), and self-sacrifice (SS) (Kim and Vandenabeele, 2010).

An individual's PSM is determined by the individual's attraction to public participation, commitment to public values, compassion, and self-sacrifice. For example, if any one of these dimensions increases, PSM would increase; conversely, if a person's PSM increases, this would not necessarily be accompanied by an increase in all dimensions. Dropping one dimension may alter the meaning of PSM because each dimension provides a unique contribution to PSM. That is, the dimensions of PSM combine to produce PSM. Researchers should include all dimensions that form PSM in the study. PSM needs to be defined as an aggregate construct, meaning that PSM is a composite of its dimensions that have several indicators (Kim, in press; Kim and Vandenabeele, 2010).

Developing the Measurement Instrument of PSM for International Use

Developing Possible Items

PSM is conceived as a second-order construct with its dimensions as first-order factors and items of the dimensions as observed indicators (Kim, in press; Kim and Vandenabeele, 2010). The dimensions represent different aspects of PSM; each dimension captures a distinct and potentially unique form of PSM; the dimensions may have different antecedents and consequences as well as different characteristics and theoretical backgrounds (Moynihan and Pandey, 2007a; Pandey and Stazyk, 2008; Perry, 1996, 1997, 2000; Perry and Wise, 1990; Perry and Vandenabeele, 2008; Taylor, 2007; Vandenabeele, 2007, 2008a, 2009). In sum, PSM is a formative construct because it can be defined as a linear sum of its dimensions (Kim and Vandenabeele, 2010).

Each dimension such as APP, CPV, COM and SS has several reflective indicators based on the following criteria (Jarvis, MacKenzie, and Podsakoff, 2003); the relative homogeneity and

interchangeability of indicators pertaining to each dimension, the high degree of covariation among indicators of each dimension, and the expectation that the indicators of each dimension are likely to be affected by the same antecedents and have the same consequences. Reflective indicators are essentially interchangeable and adding or removing indicators does not change the essential nature of a dimension.

Based upon the paper by Kim and Vandenabeele (2010), the proposed items on four dimensions were developed. The actual selection of items was a mix of pre-existing items that loaded highly on PSM dimensions in multiple studies (Giauque et al., 2009; Kim 2009a; Perry 1996; Vandenabeele, 2008b). Where appropriate items were not available, new items were drafted from other previous studies. Initially 35 items were proposed.

Review Processes

A group of researchers who shared our concern for better measurement in PSM research gathered together through e-mail in November 2009.[1] The objective was to develop a measurement instrument for PSM with a robust comparative character, in other words to create a valid instrument (on a national base) that can be compared internationally. The first round for reviewing the possible items lasted from the 16th of November until the 7th of December, 2009. All the participants were asked to review these proposed items. For this review, two criteria were implied: (1) Are these items referring to the dimensions they are claiming to refer to? (2) Are these items meaningful to the situation of each country, and in particular, to the situation of civil servants in that country? Also the participants were asked to add other new items that might better reflect a particular dimension or to rephrase items that were already on the list. The list of items, together with the basis from Kim and Vandenabeele's (2010) paper, is provided in Appendix 1.

The second round lasted from the 9th of December until the 22nd of December, 2009. During this time, 11 newly suggested items from the first round were considered (see Appendix 2). A

[1] Sangmook Kim, Wouter Vandenabeele, James L. Perry, Bangcheng Liu, Jeannette Taylor, Maria Koumenta, Emmanuel Camilleri, Lene H. Pedersen, Lotte B. Andersen, Jolanta Palidauskaite, Peter Leisink, Adrian Ritz, David Giauque, Gerhard Hammerschmid, Isabel Egger-Peitler, Renate Meyer, Cristian Pliscoff, Francesco Cerase, and Domenica Farinella were participated in the review processes.

summary of all comments and suggestions emerging from the process was distributed to the participants to stimulate activity in the second round (see Appendix 3). Based on the comments received in the second round discussion, the possible items for an international survey were selected. However, some items required further discussion, and so a third round was held from the 15th of January until the 23rd of January, 2010. One issue that remained unresolved in the discussions relates to the dimension of CPV, that is, whether this dimension needs to be divided into two sub-dimensions, one mainly focusing on public interest (CPV1) and another on public values (CPV2) such as social equity, equal opportunity, and democracy. Some argued that it is reasonable to divide CPV into two sub-dimensions because committing to public interests is different from pursuing public values and there are many important public values in democratic countries, while the others said that the CPV can cover all important public values including public interest and there is no real benefit to add one more dimension. Thus, it remains to be solved through empirical research. Finally 33 items were confirmed. On February 9, 2010, the survey questionnaire was distributed to all the participants for conducting a survey in each country.

Measures

PSM was measured using the newly developed 33-item index; seven items for the dimension of APP, thirteen items for CPV (four for public interest and nine for public values), six items for COM, and seven for SS. In the survey questionnaire, a five-point Likert type scale (1 = strongly disagree, 5 = strongly agree) was used, as other solutions such as 7-point or 10-point scales would create a burden for the respondents and clutter the lay-out, thus reducing the response rates. The items of PSM were randomly distributed in the survey format. Gender, age, education, organizational tenure and employment status were also measured in this survey.

It was necessary to translate the measurement items into the official (native) language of each country. It was important to validate the translation—the back-translation of the items into native languages. So it was suggested to ask two researchers independently to translate the English-language items and consult with each other over differences between translated items, and to test the survey items with some native respondents.

[Table 1 about here]

Samples

The international survey was conducted from March to July, 2010. The data upon which this study is based were collected in an international survey among civil servants at local governments in Australia, Belgium, China, Denmark, Italy, Korea, Lithuania, the Netherlands, United Kingdom, and USA.[2] The one principle criterion was that the samples collected in the various countries should be comparable to largest possible extent. That ruled out federal and state government, as the competencies of national or federal government, and also of state government, if any present, are different among most of the various countries included in the research. Therefore, we opted for local government as our focus, and in particular city or town level, as this level of government is more or less responsible for similar tasks in the various countries included. The respondents in each country were permanent employees in local government (town hall bureaucrats in city, county or township government), not in federal (central) government or state (provincial) government, except police officers, firefighters, school teachers, artists and musicians, nurses and doctors, while including both managerial and non-managerial level.

We aimed at about 250 respondents for each country, as this would enable us to do the analyses we wanted to perform on this data. Although there is no ideal sample size, one study recommends a sample of 200 to provide a sound basis for estimation (Hair, Black, Babin and Anderson, 2010). The method of data collection was left open. Obviously, a web-survey is the easiest way to collect the data because it is cheap in collection and coding. However, compared to paper-pencil surveys, this method has some drawbacks. First, not everybody in the sample may have access to the internet, which may cause a bias in the responses. Second, internet surveys are generally known to produce lower response rates. This would mean that a larger organization should be selected in order to obtain the 250 respondents. Web surveys were therefore recommended, if possible, but paper-pencil surveys were deemed acceptable in cases where it was not possible to conduct a web survey. It was encouraged to contact just one municipality, if enough data could be gathered. Otherwise, various municipalities are needed.

By the end of July 2010, a total of 2,472 responses were obtained. The majority of the

[2] One item in the APP dimension, "I like to discuss topics regarding public programs and policies with others," was omitted in the survey conducted in the United States.

respondents was women (56.0%), while in terms of tenure, those in the largest group (36.4%) had worked for fewer than 10 years. Table 2 shows the distribution of respondents' sex, organizational tenure, employment status, and country.

[Table 2 about here]

Analyses

Multidimensional constructs can be estimated using structural equation modeling (SEM). Both covariance-based SEM (e.g. AMOS or LISREL) and component-based SEM, or partial least squares (PLS) path modeling, can be employed to estimate the parameters in a multidimensional model, although covariance-based SEM involves various constraints regarding the distributional properties, measurement level, sample size, model complexity, identification, and factor indeterminacy (Chin, Marcolin, and Newsted, 2003; Fornell and Bookstein, 1982; Wetzels, Odekerken-Schröder, and Van Oppen, 2009). For formative second-order constructs, the restrictions necessary for identification are more stringent (Jarvis, MacKenzie, and Podsakoff, 2003; MacCallum and Browne, 1993; MacKenzie, Podsakoff, and Jarvis, 2005). The analysis of formative constructs in covariance-based SEM is not an easy task, as it involves identification rules, which make its application difficult for multidimensional models. However, PLS ensures against improper solutions by the removal of factor indeterminacy, and there are no identification problems. PLS allows for the easy handling of formative constructs (Wetzels, Odekerken-Schröder, and Van Oppen, 2009). But it lacks an index that allows for a global validation of the model. Thus, in this study, a measurement model for validating dimensional structure is tested by covariance-based SEM, and a second-order model is estimated by PLS path modeling.

The statistical analysis applied covariance-based SEM using *Amos 18.0* with the asymptotically distribution-free (ADF) and the maximum likelihood (MLE) estimation method (Arbuckle, 2009), and PLS path modeling using *Smart PLS 2.0* (Ringle, Wende and Will, 2005). The covariance-based SEM process centered validating the first-order measurement model, and PLS verifying the second-order formative model. The former was accomplished primarily through confirmatory factor analysis (CFA), while the latter is accomplished primarily through path analysis. At first, CFA was used to assess the fit of the data to the hypothesized measurement model because CFA is preferred where measurement models have a well-developed underlying theory for

hypothesized patterns of loadings. After confirming the dimensional structure using CFA, a second-order formative model was tested with PLS. When applying covariance-based SEM, we provide results from both ADF and MLE approaches with the whole sample but only results from MLE when analyzing each country's data because of sample sizes. In most cases, the differences between MLE and ADF are not substantive to the conclusions.[3]

For gauging reliability, Cronbach's alpha was tested. Convergent validity was assessed from the measurement model by determining whether each indicator's estimated pattern coefficient on its specified underlying construct is statistically significant. Discriminant validity was assessed by determining whether the confidence interval around the correlation estimate between two factors included 1.00 (Anderson and Gerbing, 1988). For model fit comparison in CFA, goodness-of-fit index (GFI), comparative fit index (CFI) and the root mean square error of approximation (RMSEA) were used. The model achieves an acceptable fit to the data when GFI and CFI equals or exceeds 0.90, and RMSEA values fall below 0.08 (Hair et al., 2010). In general, the larger the value of GFI and CFI, and the smaller the value of RMSEA, the better the fit of the model (Bollen, 1989). We also present the χ^2 test statistic because it is the fundamental measure of differences between the observed and estimated covariance matrices. Lower values of χ^2 indicate a better fit and should be nonsignificant, but the χ^2 value increases as sample size increases, and thus, for large sample sizes, this statistic may lead to rejection of a model with good fit (Hair et al. 2010).

PSM can be defined as the linear sum of its dimensions, and so a formative composite in the form of indexes needs to be empirically tested to know the relative weights (γ-parameters) of the dimensions of PSM. This process allowed us to complete a function of an individual's PSM such as $PSM = \gamma_1 APM + \gamma_2 CPI + \gamma_3 COM + \gamma_4 SS$, where γ_i is the relative weights of the first-order factors to the second-order factor (Diamantopoulous and Winklhofer, 2001; Edwards, 2001; Kim, in press).

[3] Standard MLE in CFA assumes a sample covariance matrix from a multivariate normal distribution. The discrete, noncontinuous distributions are not suitable for standard MLE in CFA. Applying standard MLE in such cases produces significant estimation problems, such as inflation of chi-square fit statistics and biased underestimation of parameters and standard errors. One preferred approach for Likert-type items is to apply ADF (Coursey and Pandey, 2007b; Flora and Curran, 2004). However, "unless sample sizes are extremely large (1,000 to 5,000 cases), the ADF estimator performs very poorly and can yield severely distorted estimated values and standard errors" (Byrne, 2010: 105). Given normally distributed categorical variables, MLE can be used with little worry when a variable has four or more categories. If there is a large sample, a five-point Likert scale and the skewness and kurtosis of variables is within acceptable limits, it suggests distribution symmetry. 'In most cases, where the hypothesized model is well specified and the scaling based on more than three categories, it seems unlikely that there will be much difference between the findings." (Byrne, 2010: 160).

Results

A total of 2,472 surveys were obtained, but of these, 1,884 have been utilized in this study, as cases with missing values and those in the United States have been deleted. Using *SPSS 18.0*, descriptive statistics were computed for individual items, as shown in table 1. In the assessment of normality, no items showed a skew or kurtosis value greater than the cutoffs of |3| or |8| recommended by Kline (2005). As data were distributed normally, MLE as well as ADF estimation was used. Based on inspection of item-total correlations, two items (COM4 and CPI4) were dropped from further analysis because they were weakly correlated with the overall index (.068 and .253). The deletion of two items left 31 items for the next stage of analysis.

The five-correlated-factor model was tested using CFA. The CFA model in the first study hypothesized a priori that (1) responses to the 31-item PSM measurement instrument could be explained by five factors such as APP, CPV1, CPV2, COM, SS; (2) each item would have a nonzero loading on the PSM factor that was designed to measure and zero loadings on all other factors; (3) the five factors would be correlated; and (4) measurement error terms would be uncorrelated. The resulting CFA with MLE suggested that the initial five-correlated-factor model was not a good fit to the data, $\chi^2(df = 424) = 3450.1$, $p < .001$; GFI = 0.880, CFI = .811, RMSEA = 0.062 [.060, .063].

[Table 3 about here]

Given the disconformation of the initial model, an effort was made to estimate an alternative model. At this stage, APP was highly correlated with CPV1 ($r = .968$ and .942), suggesting the two dimensions were not unique and lacked discriminant validity. Thus they were combined to form a single dimension, Attraction to Public Service (APS). The items of CPV1 may be regarded as action-oriented by the respondents because dedication to public service, community and common good is underlined in these items. Consequently it is reasonable to combine APP with CPV1 to form APS that focuses more on a disposition to serve the public, to work for community, and to participate in public policy processes. After the overall number of dimensions had been reduced to four, using factor loading as a criterion, the items with lowest factor loading in each dimension were deleted, and a CFA model with the remaining items was tested again and again until it achieved an acceptable fit to the

data. The outcome of this refinement process was a 17-item index of four factors. The MLE and ADF estimates for the four-dimension model are presented in table 4.

[Table 4 about here]

Cronbach's coefficient alpha for 17-item PSM index is .87, and the coefficient alphas for the four dimensions ranged from .63 to .79. The alpha coefficients provide independent corroboration for the results obtained from use of the CFA. The resulting factor structure shows a clean four-factor structure with all items loading significantly onto their a priori dimension ($p < .001$), and the standardized factor loadings ranging from 0.507 to 0.783 in MLE, and from .513 to .825 in ADF. The results provide support for convergent validity. The correlation estimates between the two factors range from 0.412 to 0.845 in MLE, and from .511 to .851 in ADF, and the confidence intervals (±2 standard errors) around the correlation estimates between the two factors do not include 1.00. The result provides support for discriminant validity.

To find out whether there is any difference in the factor structure of PSM among countries, we conducted a series of CFAs with each country's dataset, and followed the same procedure as when analyzing the sample as a whole. As table 5 shows, even though the items vary according to country differences, the four-factor structure had an acceptable fit to data. Thus the results confirm that the four-factor structure of PSM can be generalized. When all four dimensions of PSM and at least any three items for each dimension are included in a survey, we can assure equivalence of survey items cross-nationally.

[Table 5 about here]

Then, the question of how to consolidate these four dimensions into the PSM construct needs to be addressed. PLS path modeling allows for the conceptualization of a multidimensional model through the repeated use of reflective indicators (Wetzels, Odekerken-Schröder, and Van Oppen, 2009). A second-order latent variable can be created by specifying a latent variable that represents all the reflective indicators of the underlying first-order latent variables. Thus, the observed indicators are used twice: for the first-order latent variable (primary loadings) and for the second-order latent variable (secondary loadings). PSM is a second-order construct with its four dimensions as first-order factors and items of the dimensions as observed indicators, and the direction of the relationship is from the dimensions to PSM (Kim, in press). This will result in a R^2 value of PSM of unity. The weights obtained in this formative mode could be used to assess the impact of the dimensions on PSM. It means that PSM is a composite of its dimensions.

[Figure 1 about here]

Having the four dimensions and 17 items (see table 4), the second-order formative model with the whole sample (n = 1,884) was tested using PLS. In order to assess the statistical significance, bootstrap analysis using 500 replications was used. The formative model in PLS was assessed by examining the path coefficients and t-statistics. All the path coefficients in the model were positive and significant at 0.001 level. APS contributed the strongest to PSM with $\beta = 0.3849$, and the next was SS ($\beta = 0.3422$). Thus generally, we can evaluate each individual's PSM with the function, PSM = 0.38APS + 0.27CPV + 0.28COM + 0.34SS.

To find out whether there is any variance in the relative weights of the dimensions on PSM, we conducted a series of PLS with each country's dataset, using the second-order formative model having the four dimensions and same items of each country (see table 5). Regression imputation was

used to calculate replacement values for the missing values in each country's dataset for PLS estimation (Hair et al., 2010). The test results showed that all the path coefficients in the model of each country were positive and significant at $p < .001$. SS contributed the strongest to PSM in China, Korea, Lithuania and the Netherlands, while APS impacted the strongest to PSM in the other countries. Table 6 represents the results of beta coefficients.

[Table 6 about here]

Conclusion

The purpose of this study is to develop the measurement instrument of PSM for doing cross-national research and comparison. On the basis of the sharpened construct of PSM (Kim and Vandenabeele, 2010), the thirty-three items were developed with the four dimensions, APP, COM, SS, and CPV that divided into two sub-dimensions (CPV1 and CPV2). Data from the international survey conducted in ten countries were used in the study, and we found that the four-factor structure of PSM can be generalized. APP and CPV1 were combined to form a single dimension, attraction to public service (APS). This study provided the 17-item measurement index of PSM with the four dimensions such as APS, CPV, COM, and SS. A series of CFAs with each country's dataset confirmed the four-dimension structure of PSM. Thus when all four dimensions of PSM and at least any three items for each dimension are used in a survey, we can assure equivalence of survey items cross-nationally.

The theoretical consideration of the relationships between PSM and its dimensions shows that PSM is an aggregate construct, and the empirical testing also shows that the formative model has more desirable statistical properties than the reflective model (Kim, in press). It means that the dimensions of PSM combine to produce PSM and so it is defined as a linear sum of its dimensions. After developing a set of more appropriate measurement items, it needs to conduct empirical testing to find the relative weights of the dimensions on PSM because PSM can be measured by assigning the dimensions empirically derived weights obtained from a formative model and summing the average of each dimension multiplied by its weight. The test result using PLS path modeling generated a function

of PSM as PSM = 0.38APS + 0.27CPV + 0.28COM + 0.34SS. We can use this function to evaluate each individual's PSM, and it may make easy to analyze data empirically. Or we can use a more accurate function based on each country's empirical analysis. Overall indexing PSM by measuring all the dimensions and simply summing the averages of each dimension can make it easier to measure PSM in practice.

In order to facilitate research internationally, the PSM construct needs to be improved conceptually and operationally. Kim and Vandenabeele (2010) have dealt with the conceptual composition and operational dimensions of PSM, as well as the measurement model of PSM. The next step is to develop an internationally robust measurement instrument of PSM. This study provided a set of appropriate items for measuring PSM, confirmed the dimensional structure of PSM, and estimated the relative weights of the PSM dimensions. We hope that this study contributes to enhance cross-national research and comparison and generate cumulative knowledge internationally.

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Table 1
Possible Indicators of PSM and Descriptive Statistics (n = 1,884)

Dimensions and items	Mean	Standard Deviation	Item-Total Correlation
Attraction to Public Participation (APP)			
APP1: I am interested in helping to improve public service	4.06	.689	.545
APP2: I am satisfied when I see people benefiting from the public programs I was involved in	4.39	.651	.416
APP3: I like to discuss topics regarding public programs and policies with others	3.54	.879	.483
APP4: I believe that public sector activities contribute to our general welfare	3.90	.737	.403
APP5: I admire people who initiate or are involved in activities to aid my community	4.24	.637	.479
APP6: Contributing to public programs and policies helps me realize myself	3.57	.806	.473
APP7: It is important to contribute to activities that tackle social problems	4.11	.687	.542
Commitment to Public Values (CPV)			
Sub-dimension for Public Interests (CPV1)			
CPI1: Meaningful public service is very important to me	4.12	.680	.512
CPI2: It is important for me to contribute to the common good	4.05	.643	.584
CPI3: I would prefer seeing public officials do what is best for the whole community, even if it harmed my interests	3.47	.877	.469
CPI4: Serving the public interest is more important than helping a single individual	3.44	.951	.253
Sub-dimension for Public Values (CPV2)			
CPV1: I think equal opportunities for citizens are very important	4.24	.706	.480
CPV2: It is important that citizens can rely on the continuous provision of public services	4.16	.676	.419
CPV3: It is fundamental that public services respond to the needs of the citizens	4.30	.703	.328
CPV4: Decisions regarding public services should be democratic despite the time and effort it takes	3.95	.835	.304
CPV5: Everybody is entitled to a good service, even if it costs a lot of money	3.68	.884	.360
CPV6: It is fundamental that the interests of future generations are taken into account when developing public policies	4.26	.670	.428
CPV7: To act ethically is essential for public servants	4.44	.641	.442
CPV8: I believe that public employees must always be aware of the legitimacy of their activities	4.34	.681	.356
CPV9: I personally identify with the aim of protecting individual liberties and rights	4.12	.746	.368
Compassion (COM)			
COM1: It is difficult for me to contain my feelings when I see people in distress	3.53	.924	.397
COM2: I feel sympathetic to the plight of the underprivileged	3.89	.801	.489
COM3: I empathize with other people who face difficulties	3.86	.680	.380
COM4: I have little compassion for people in need who are unwilling to take the first step to help themselves	2.86	1.023	.068
COM5: I get very upset when I see other people being treated unfairly	4.06	.744	.490
COM6: Considering the welfare of others is very important	3.84	.761	.489
Self-Sacrifice (SS)			
SS1: Making a difference to society means more to me than personal achievements	3.61	.887	.491
SS2: I am prepared to make sacrifices for the good of society	3.24	.856	.579
SS3: I believe in putting civic duty before self	3.42	.934	.423
SS4: I am willing to risk personal loss to help society	3.00	.971	.521
SS5: People should give back to society more than they get from it	3.50	.853	.441
SS6: Serving other citizens would give me a good feeling even if no one paid me for it	3.74	.963	.341
SS7: I would agree to a good plan to make a better life for the poor, even if it costs me money	3.50	.850	.535

Table 2
Background of Respondents (*n* = 2,472)

Variables	Characteristics	Respondents (%)
Sex	Male	43.4
	Female	55.2
	N/A	1.5
Length of service (years)	0 ~ 10	35.7
	10 ~ 20	25.5
	20 ~ 30	17.5
	30+	19.4
	N/A	1.9
Organizational status: "Do you supervise employees?"	No	54.0
	Yes	32.9
	N/A	13.1
Country	Australia	10.1
	Belgium	8.6
	China	9.3
	Denmark	10.1
	Italy	6.5
	Korea	10.2
	Lithuania	9.5
	The Netherlands	10.1
	United Kingdom	10.5
	USA	15.0

Note: N/A = no answer.

Table 3
Standardized factor loadings and correlations for the 31-item PSM index (n = 1,884)

Dimensions and items		SFL (MLE)	SFL (ADF)	Alpha
APP	APP1	.634	.666	.74
	APP2	.479	.551	
	APP3	.538	.639	
	APP4	.452	.565	
	APP5	.550	.525	
	APP6	.527	.618	
	APP7	.594	.602	
CPV1	CPI1	.591	.590	.55
	CPI2	.651	.692	
	CPI3	.479	.603	
CPV2	CPV1	.609	.590	.73
	CPV2	.538	.609	
	CPV3	.417	.506	
	CPV4	.388	.442	
	CPV5	.403	.514	
	CPV6	.537	.500	
	CPV7	.598	.621	
	CPV8	.468	.555	
	CPV9	.444	.476	
COM	COM1	.511	.589	.68
	COM2	.548	.627	
	COM3	.486	.480	
	COM5	.586	.669	
	COM6	.584	.668	
SS	SS1	.544	.609	.78
	SS2	.754	.820	
	SS3	.538	.669	
	SS4	.740	.783	
	SS5	.499	.470	
	SS6	.363	.464	
	SS7	.664	.706	
Measures of fit (MLE)		χ^2 (df = 424) = 3450.1, p < .001; CFI = .811; GFI = .880; RMSEA = .062, [.060, .063]		
Measures of fit (ADF)		χ^2 (df = 424) = 2427.9, p < .001; CFI = .461; GFI = .810; RMSEA = .050, [.048, .052]		

Inter-factor correlations: MLE (ADF)				
	1	2	3	4
1. APS				
2. CPV1	.968(.942)			
3. CPV2	.832(.835)	.767(.823)		
4. COM	.752(.831)	.734(.814)	.730(.802)	
5. SS	.679(.809)	.778(.935)	.473(.653)	.741(.779)

Note. SFL = standardized factor loading. All factor loadings and correlations are significant at p < .001.

Table 4
Standardized factor loadings and correlations for the 17-item PSM index (n = 1,884)

Dimensions and items	SFL (MLE)	SFL (ADF)	Alpha
APS			
APP1: I am interested in helping to improve public service	.652	.682	
APP3: I like to discuss topics regarding public programs and policies with others	.536	.599	.73
APP7: It is important to contribute to activities that tackle social problems	.582	.560	
CPI1: Meaningful public service is very important to me	.609	.636	
CPI2: It is important for me to contribute to the common good	.631	.658	
CPV			
CPV1: I think equal opportunities for citizens are very important	.612	.581	
CPV2: It is important that citizens can rely on the continuous provision of public services	.541	.550	.66
CPV6: It is fundamental that the interests of future generations are taken into account when developing public policies	.528	.513	
CPV7: To act ethically is essential for public servants	.593	.567	
COM			
COM1: It is difficult for me to contain my feelings when I see people in distress	.507	.571	
COM2: I feel sympathetic to the plight of the underprivileged	.519	.576	.63
COM5: I get very upset when I see other people being treated unfairly	.588	.629	
COM6: Considering the welfare of others is very important	.581	.625	
SS			
SS2: I am prepared to make sacrifices for the good of society	.778	.806	
SS3: I believe in putting civic duty before self	.563	.625	.79
SS4: I believe in putting civic duty before self	.783	.825	
SS7: I would agree to a good plan to make a better life for the poor, even if it costs me money	.665	.686	
Measures of fit (MLE)	χ^2 (df = 113) = 857.6, p < .001; CFI = .914; GFI = .949; RMSEA = .059, [.055, .063]		
Measures of fit (ADF)	χ^2 (df = 113) = 675.1, p < .001; CFI = .695; GFI = .900; RMSEA = .051, [.048, .055]		
Inter-factor correlations: MLE (ADF)			
	1	2	3
1. APS			
2. CPV	.845 (.851)		
3. COM	.756 (.774)	.738 (.816)	
4. SS	.588 (.630)	.412 (.511)	.723 (.718)

Note. SFL = standardized factor loading. All factor loadings and correlations are significant at p < .001.

Table 5

Results of CFA in countries (MLE): Standardized factor loadings and Measures of Fit

Factors & Items	Australia	Belgium	China	Denmark	Italy	Korea	Lithuania	Nether lands	UK	USA
APS										
APP1	.618	.698	.715	.670	.614	.665			.702	.672
APP3			.615							
APP5	.700	.607		.563			.686	.547	.671	.561
APP6			.725	.578		.661				.581
APP7			.624	.704	.753		.501	.697	.663	.703
CPI1	.813	.697				.665		.606	.733	
CPI2	.788	.596		.677	.639	.602	.673	.614	.748	.676
CPV										
CPV1	.679	.575		.571	.646	.589	.533	.552	.761	.547
CPV2		.622	.677	.561	.572	.574	.562	.516		.571
CPV5			.639							
CPV6						.643			.634	
CPV7	.585	.578		.715		.656	.500	.571	.581	.717
CPV8	.639									
CPV9	.634		.559	.601	.562			.536	.592	
COM										
COM1					.649					
COM2	.697	.733	.605	.717	.610	.574		.740	.692	.720
COM3	.650	.606	.671	.517		.587	.549	.615	.642	.513
COM5	.666	.473	.634	.703		.539	.673	.517	.542	.698
COM6	.692		.650	.614	.691	.690	.411		.754	.617
SS										
SS1						.733		.625		
SS2	.730	.743	.852	.789	.829	.751	.704	.720	.736	.791
SS3	.739	.576	.679	.728		.663		.710	.779	.728
SS4	.773	.705	.810	.806	.676	.815	.723	.705	.793	.805
SS7	.628	.770	.781	.615	.669		.636	.662	.632	.616
Inter-factor correlations	.19~.76	.33~.89	.72~.89	.35~.90	.48~.94	.45~.85	.49~.81	.43~.89	.45~.88	.35~.90
Sample size	250	214	230	249	162	253	236	249	261	370
Measures of Fit										
χ^2	234.5	146.6	187.6	215.5	94.9	220.5	94.5	172.1	240.0	200.0
df	98	71	84	113	48	98	59	98	113	98
CFI	.906	.910	.926	.928	.919	.910	.940	.932	929	.924
RMSEA	.075	.071	.073	.060	.078	.070	.051	.055	.066	.065

Note. All factor loadings and correlations are significant at $p < .001$.

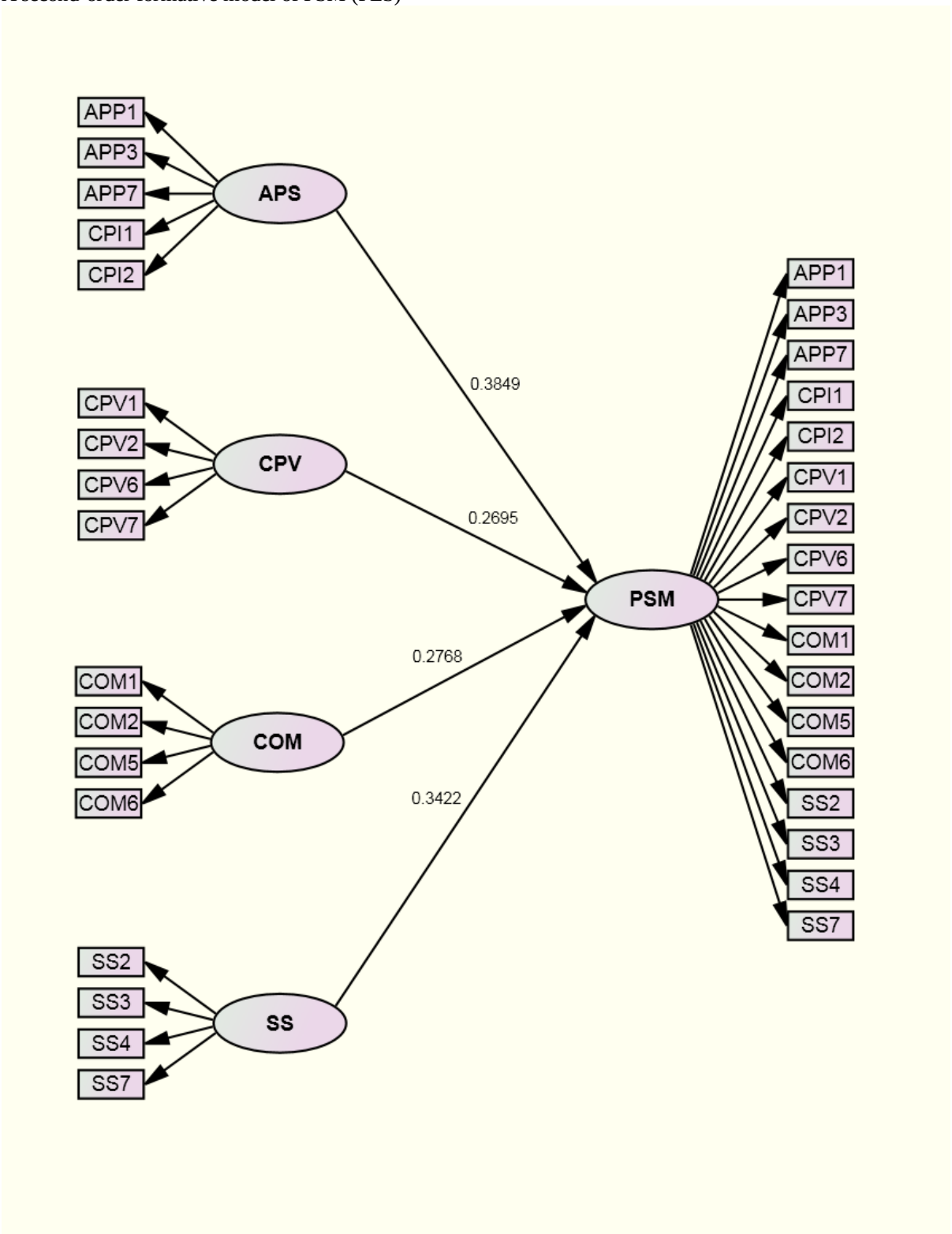
Table 6

PLS results for formative models of PSM

Country	Sample size	Path coefficients			
		APS → PSM	CPV → PSM	COM → PSM	SS → PSM
All	1,884	0.3849	0.2695	0.2768	0.3422
Australia	250	0.3962	0.2639	0.3434	0.2808
Belgium	214	0.3916	0.2792	0.2863	0.3749
China	230	0.3091	0.2164	0.2738	0.3805
Denmark	249	0.3643	0.2606	0.3123	0.2892
Italy	162	0.3473	0.2810	0.3325	0.2982
Korea	253	0.3344	0.2631	0.2819	0.3518
Lithuania	236	0.3586	0.3014	0.2971	0.3722
Netherlands	249	0.3408	0.2078	0.2642	0.4496
UK	261	0.3836	0.2657	0.2884	0.2646
USA	370	0.3763	0.2155	0.3131	0.2952

Note: All path coefficients are significant at $p < .001$.

Figure 1
A second-order formative model of PSM (PLS)



Notes: All path coefficients are significant at $p < .001$.

Appendix 1: Dimensions and Possible Items of PSM (First Round)

1. Attraction to Public Participation (← Attraction to policy making)

Assessment
The dimension of attraction to policy making needs to be refined as the dimension of attraction to public participation. The items of the original dimension are not appropriate for measuring personal attraction to public policy making because the items may tap dissatisfaction with politicians more than the idea of interest in public policy making and the original dimension has not fared as well as others in Maltese and Korean research (Camilleri 2006; Coursey and Pandey 2007; Coursey, Perry, Brudney and Littlepage 2008; DeHart-Davis, Marlowe, and Pandey 2006; Kim 2009a, 2009b;. This dimension of attraction to public participation needs to focus more on a disposition to work in the public sector, to participate in the public policy process and in activities for community and social development; and it needs to develop the items with more face validity as indicators of instrumental motives.

Possible items
(1) I am interested in developing public programs helping my country or community. (Kim 2009a)
(2) Sharing my views on public policies with others is attractive to me. (Kim 2009a)
(3) I am satisfied when seeing people get benefits from the public programs I was involved in. (Kim 2009a)
(4) I like to discuss political subjects with others. (Giauque et al. 2009)
(5) I think the governmental activities contribute to our welfare.
(6) I like to initiate actions to help out my community.
(7) I do not care much about politicians. (Perry 1996)

2. Commitment to Public Values (← Commitment to public interest)

Assessment
The dimension of commitment to public interest needs to be refined as the dimension of commitment to public values. This dimension needs to focus more on a personal disposition to pursue public values. Some of the original items need to be excluded because they overlap with the dimension of self-sacrifice, and new items need to be developed for representing the value-based motives and having better discriminant validity (Castaing 2006; Leisink and Steijn 2009; Moynihan and Pandey 2007a; Taylor 2007; Wright and Pandey 2008). This refinement will help to solve the problem of considerable overlap with the dimension of self-sacrifice. Another possible supplement to this dimension could be what Vandenabeele (2008b) has defined as the 'democratic governance' . This dimension refers mainly to the public values that are associated with the operations of government administration, such as equality or accountability (Giauque et al. 2009; Vandenabeele, Scheepers, and Hondeghem 2006). Thus it seems to be possible to have one or more dimensions for public values and public interest.

Possible items for public interest
(1A) Meaningful public service is very important to me. (Perry 1996)
(2A) It is important for me to contribute for the common good. (Giauque et al. 2009)
(3A) I recognize myself with the mission of protection of liberties and rights endorsed by the nation-state. (Giauque et al. 2009)
(4A) I would prefer seeing public officials do what is best for the whole community, even if it harmed my interests. (Perry 1996)
(5A) To me, serving the public interest is more important than helping other people. (Vandenabeele 2008b)

Possible items for public values
(1B) I recognize myself with the promotion of the equality of chances endorsed by the nation-state. (Giauque et al. 2009)
(2B) It is fundamental that the public service provided to the citizen is regular and continuous. (Giauque et al. 2009)
(3B) It is fundamental that public service innovates to respond to the new needs of the citizens/clients. (Giauque et al. 2009)
(4B) The dignity and well-being of all should be the most important concerns in any society. (Steenbergen, 1996)
(5B) It is important that public servants account for all the costs/expenses they make. (Vandenabeele 2008b)

(6B) We have to do everything in our power to pursue the goal of democracy.

3. Compassion

Assessment
New and more appropriate items should be developed for the dimension of compassion. The original dimension could not be validated in the United States (Wright and Pandey 2005) and unconfirmed in China (Liu, Tang and Zhu 2008). The original items of compassion need to be revised for better representing a unique and salient quality of affective motives (DeHart-Davis, Marlowe, and Pandey 2006; Moynihan and Pandey 2007b; Vandenabeele 2009), and so the new items need to be more focused on affective bonding with the identified objects such as other members of a social category or of a political system.

Possible items
(1) It is difficult for me to contain my feelings when I see people in distress. (Perry 1996)
(2) I feel sympathetic to the plight of the underprivileged. (Kim 2009a)
(3) I am often reminded by daily events how dependent we are on one another. (Perry 1996)
(4) I feel compassion for others in the difficulties they are facing. (Steffen and Masters 2005)
(5) It is not really my problem if others are in trouble and need help. (Beutel and Marini 1995)
(6) I find it hard to be sympathetic toward starving people in foreign lands when there is so much trouble in our own country. (Beutel and Marini 1995)
(7) I get very upset when I see other people treated unfairly. (Beutel and Marini 1995)
(8) I would agree to a good plan to make a better life for the poor, even if it cost me money. (Beutel and Marini 1995)
(9) To me, patriotism includes seeing the welfare of others (Perry 1996)
(10) I care very much about other people

4. Self-Sacrifice

Assessment
Self-sacrifice is fundamental to the construct of PSM and so it should be a component of the operational dimensions. Each category of public service motives represents a unique aspect of PSM and so needs to be independently included in the operational dimensions. This is theoretically a better fit than models where, for example, self-sacrifice and public interest are collapsed (Perry 1996; Vandenabeele 2008a), or where self-sacrifice is left out altogether (Coursey and Pandey 2007; Moynihan and Pandey 2007b; Scott and Pandey 2005). Even though it is not essential to develop a one-to-one correspondence between the conceptual components and the operational dimensions, and there is no mutually exclusive relationship, the four-dimension model is more suitable than the three-dimension model because each dimension can capture a distinct and unique component of PSM, and the four-dimension model is better for explaining and predicting the various aspects of public service–related behavior.

Possible items
(1) Making a difference in society means more to me than personal achievements. (Perry 1996)
(2) I am prepared to make enormous sacrifices for the good of society. (Perry 1996)
(3) I believe in putting duty before self. (Perry 1996)
(4) I am one of those rare people who would risk personal loss to help someone else. (Perry 1996)
(5) I think people should give back to society more than they get from it. (Perry 1996)
(6) Serving other citizens would give me a good feeling even if no one paid me for it. (Perry 1996)
(7) Much of what I do is for a cause bigger than myself (Perry 1996)

Appendix 2: Newly suggested items through the First Round

1. Items for the Attraction to Public Participation Dimension

(1) In the public domain every person should be counted as equal.
(2) I enjoy to think and argue in a political way.
(3) I am satisfied when seeing my ideas being integrated in public policies.
(4) I can easily relate to the way of thinking and arguing of politicians.
(5) Working in the public sector I can better realize myself.

2. Items for the Public Values Sub-Dimension

(1) Public service should give value for money.
(2) Cost considerations should play an important role in decisions about public service provision.
(3) It is fundamental that the interests of future generations are taken into account when developing public policies.
(4) To act with correct ethics is for public servants as important as their professional competence.
(5) Primarily public servants should be accountable to the public and not to their superiors.

3. Items for the Self-Sacrifice Dimension

(1) I would agree to a good plan to make a better life for the poor, even if it costs me money.

Appendix 3: An example of a summary of comments and suggestions (Second Round)

On the item, "I am interested in developing public programs helping my country or community."

A: It is a good sentence but is it possible for everyone to "develop public programs"? Even public officials are limited to do this

B: OK

C: or the special group

D: Double barrel and difficult to translate to my country. "I am interested in helping to improve public services."

E: Good, but I feel that wording requires revision. If we draw sample from local government then 'country' is redundant. "I am interested in developing public policy programs that aim in helping my community."

F: 4 (General appreciation from1 to 4) Not clear whether it refers to one's work, or to one's concern as a citizen. "(In my work) I am interested in contributing to the development of public etc…"

G: Instead of development I would use implementing

H: Delete 'public' which is redundant because of the characteristic 'helping my country or community' but add 'or implementing". "I am interested in developing or implementing programs helping my country or community."

I: Referring to dimension? Wording. Similar to item 6.

Note: Names have been changed to alphabets in order to ensure the anonymity of respondents.