

MEASURING COMMON GOODS: FIRST STEPS TOWARD VALIDATION

José Luis Ávila-Valdez*, J.-Martín Castro-Manzano**

ABSTRACT

Based upon the theoretical framework proposed by Nebel and Arbesu-Verduzco (in this issue) about common good and its indicators, we summarily expound an instrument designed for measuring common good and social dynamics that was applied in the municipality of Atlixco, Puebla, and then we discuss a couple of models – Model 1 and Model 2 – arranged after it. We report that Model 1, the result of said application, presents some issues in spite of having good values of reliability. Hence, in an effort to enhance the initial instrument we show that Model 2, an adaptation of Model 1, presents a good fit plus good internal consistency. These results, then, serve an auxiliary purpose toward the validation of the instrument for future applications.

Keywords: Reliability, Structural equation modeling, Social dynamics.

JEL Classification: C13, C18, C30.

ISSN: 0035-676X (print); 1827-7018 (digital)

DOI: 10.26350/000518_000056

1. INTRODUCTION

There is a short story by Borges (1999), *Del rigor en la ciencia* (On Exactitude in Science), that provides a fundamental insight about our intent with this paper, namely, that when we try to scientifically understand something, *per fas et nefas*, we have to develop – and validate – a scientific model of it. Granted, this is sort of a truism, but the place of a model of this kind – and its validation – within a scientific process is far from being overstated.

It is not unusual to think of this process as a sequence that comprises observation, data gathering, prediction, and evaluation – of course, not necessarily in this order. This view of the scientific process, commonly referred to as the hypothetico-deductive method, is not privy just to scientists or philosophers of science, but its actual practice is not a given. Common scientific practice is more complex than that and, although here is not the place for such a discussion, said practice certainly looks like a procedure that includes, more or less orderedly, the assumption

* José Luis Ávila-Valdez, Department of Mathematics, UPAEP University, 21 Sur, 1103, 72410 Puebla. Email: joseluis.avila@upaep.mx.

** J.-Martín Castro-Manzano, Faculty of Philosophy, UPAEP University, 21 Sur, 1103, 72410 Puebla. Email: josemartin.castro@upaep.mx.

Acknowledgements: We would like to thank the referees for valuable comments and suggestions.

of a general theory plus some subsidiary hypotheses through which a set of theoretical models can be plausibly proposed. And by using a set of indicators and some data we can obtain testable predictions and on-the-fly statistical evaluations that allow us to restate and reiterate the initial set of models in order to better fit the data (cfr. Bunge, 2006: 182ff).

We mention this whole context because in this contribution we attempt to report part of this process. Hence, based upon the theoretical framework proposed by Nebel and Arbesu-Verduzco (in this issue) about common good and its indicators, (§2) we summarily expound an instrument designed for measuring common good and social dynamics that was applied in the municipality of Atlixco, Puebla, and then (§3) we discuss a couple of models – Model 1 and Model 2 – arranged after it. We report that Model 1, the result of said application, presents some issues in spite of having good values of reliability. Hence, in an effort to enhance the initial instrument we show that Model 2, an adaptation of Model 1, presents a good fit plus good internal consistency. The relevance of this contribution, thus, stems from its auxiliary purpose toward the validation of the instrument for future applications.

2. INSTRUMENT AND MODEL

After the framework proposed by Nebel and Arbesu-Verduzco (in this issue), an instrument was developed in order to measure the structure of common good and its social dynamics. The instrument is a Likert scale questionnaire divided into six sections. The first section is intended to gather socio-economical data, the remaining sections attempt to define a social dynamic score (Score SD).

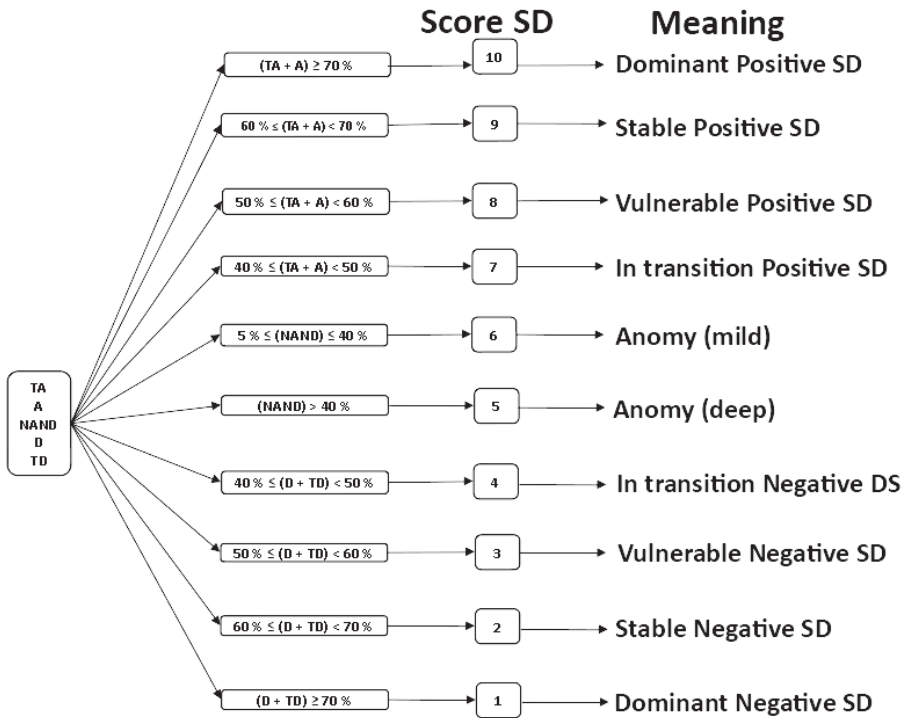
The values of the scale include, as usual, “Totally Agree” (TA), “Agree” (A), “Neither agree nor disagree” (NAND), “Disagree” (D), and “Totally Disagree” (TD). And hence, by using this scale it is possible to determine, for each dimension, an aggregate indicator or Score SD obtained by way of a geometric mean. The minimum and maximum values that such a score can take are 1 and 10, respectively. Values close to 1 can be interpreted as representing a dominant negative social dynamic in the corresponding dimension or construct of a sample (i.e. a locality, in terms of Nebel and Arbesu-Verduzco (in this issue)); inversely, values close to 10 can be interpreted as representing a dominant positive social dynamic (Figure 1).

Nebel and Arbesu-Verduzco (in this issue) related this numerical scale to a description of social dynamics. The scale hence defines a dominant or stable social dynamics, either positive (10-9) or negative (1-2). Then comes a zone of vulnerability (8 and 3) where the social dynamic is contested or not supported. And finally, the zone enclosing the center of the scale (7-4) is one of instability in so far as it is prone to a sudden change characterized by anomia, namely, a social situation in which an undecided population may move downwards or upwards the scale.

Regarding the sections of the instrument, the first section gathers information about the socio-economic level of each participant through a set of 11 standardized

items proposed by the National Institute of Statistics and Geography (INEGI, by its name in Spanish, *Instituto Nacional de Estadística y Geografía*), an autonomous agency of the government dedicated to coordinate the statistical and geographical information of the country. These items allowed us to determine a socio-economic level index as defined by the Mexican Association of Marketing Research and Public Opinion Agencies (AMAI, by its name in Spanish, *Asociación Mexicana de Agencias de Investigación de Mercado y Opinión Pública*), an agency responsible for setting the standards of quality and socio-economic levels.

FIGURE 1 – Description of the solution space: tree diagram and social dynamics

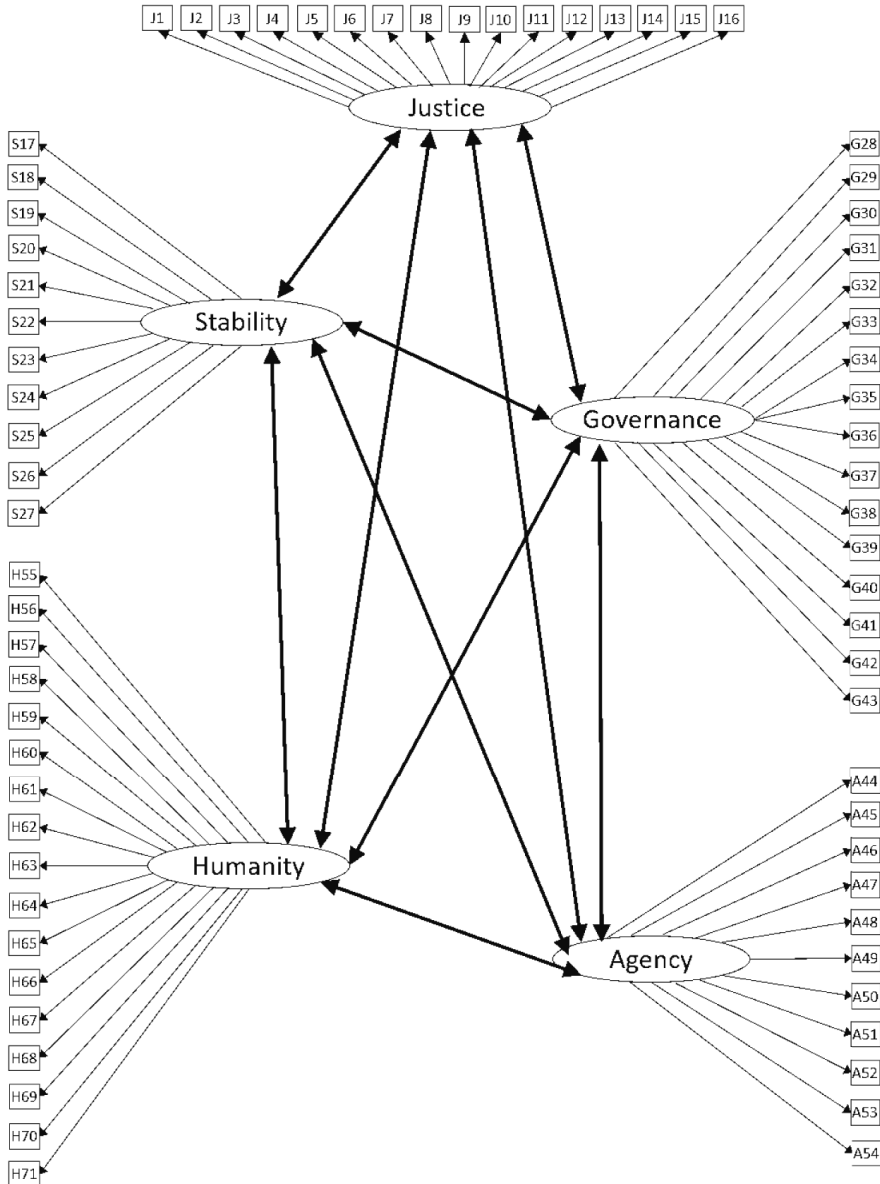


The following five sections capture each one of the normative drivers or dimensions of the system of common goods: “agency” (measured by 11 items prefixed with an “A”), governance (measured by 16 items prefixed with a “G”), stability (measured by 11 items prefixed with an “S”), justice (by 16 items prefixed with a “J”), and humanity (by 17 items prefixed with an “H”) (*vide Appendix A, Table 5*).

Now, since these dimensions are not supposed to be understood in isolation but in a systemic way, their scores are related to each other (cfr. Nebel and Arbesu-Verduzco (in this issue)). This understanding specifies the structure of an initial

model – Model 1 – via a global description of its items and its topology (Figure 2). However, since this instrument and its resulting model is both novel and qualitative in nature, the next step is, of course, to advance some steps toward its validation.

FIGURE 2 – Initial model (i.e. Model 1)



3. SAMPLE, ANALYSIS, AND VALIDITY

3.1. *Sample*

The sample consisted of 450 participants selected via a stratified sampling method in order to ensure an homogeneous distribution with respect to sex, age, and educational level. This is consistent with the recommended size (between 200 and 500) for a robust diagonally weighted least squares (RDWLS) method of estimation with ordinal variables within structural equation modelling (SEM) (Bandalos, 2014; Forero et al., 2009).

The instrument was applied in the municipality of Atlixco (18°54'N98°27'W), a town about 40 kilometres from the city of Puebla with a total population of 134,364 people. The composition of the sample can be further analyzed as follows: more than three quarters of the participants (80.7%) lived in urban areas and the rest (19.3%) in rural areas; 52.7% were woman and 47.3% were men between the ages 18 to 89, with a median age of 38. Regarding the highest level of education, 63.8% reported elementary education; 20.9%, high school; and 15.3% reported having a bachelor's degree. In terms of the socio-economic level index (AMAI, 2018) that allows us to classify Mexican households into seven downward ordered levels (A/B, C+, C, C-, D+, D, and E), the distribution of the sample was: 2.2% A/B, 6.4% C+, 17.1% C, 26.2% C-, 23.3% D+, 23.1% D, and 1.6% E.

3.2. *Analysis*

Goode and Hatt – as cited in (Hammersley, 1987: 9) – define reliability as the extent to which repetition of a study would result in the same data and conclusions. Consequently, reliability is to be understood as a measure of the degree to which a set of indicators not only is internally consistent but also measures the same thing (cfr. Hair et al. (2014: 548).

There is a plethora of coefficients designed to measure the internal consistency or reliability of a model (cfr. Viladrich et al., 2017); however, most of them assume data is, at least, defined in terms of an interval scale. Nevertheless, given the ordinal nature of the data analyzed via our instrument (i.e. via a Likert scale), we have used the categorical omega (ω_c) coefficient (Green and Yang, 2009; Kelley and Pornprasertmanit, 2016) in order to evaluate the reliability of the instrument, since this coefficient takes into account the ordinal nature of data obtained via a Likert scale. Following the same notation as in (Kelley and Pornprasertmanit, 2016), the ω_c coefficient is given by

$$\omega_c = \frac{\sum_{i=1}^k \sum_{i'=1}^k \sigma_{ii'}(\lambda_i \lambda_{i'})}{\sum_{i=1}^k \sum_{i'=1}^k \sigma_{ii'}(\rho x_i x_{i'})} \quad (1)$$

where the numerator is the variance explained by true scores, and the denominator is the polychoric correlation between items i and i' ; $\omega_c \in [0, 1]$, and similar to other coefficients used to measure reliability, at least a value of 0.7 is required to confirm or indicate internal consistency.

Additionally, and only as a reference point with respect to the classic reliability methodology, we also present the Cronbach's alpha (α) coefficient (Cronbach, 1951; Trinchera et al., 2018). For this purpose, the items which are originally categorical are treated as if they were continuous. The coefficient can be calculated from covariances (α) or from correlations (α_ρ), with the following two expressions:

$$\alpha = \left(\frac{k}{k-1} \right) \left(1 - \frac{\sum_{i=1}^k s_i^2}{s_t^2} \right) \quad (2)$$

and

$$\alpha_\rho = \frac{k\rho}{1 + \rho(k-1)} \quad (3)$$

where s_i^2 stands for the variance of item i , s_t^2 stands for the variance of the observed total values, k is the number of items, and ρ is the average of the linear correlations between each item. The expressions given in (2) and (3) are equivalent in case the original variables are standardized. As usual, α , $\alpha_\rho \in [0, 1]$ and a value greater than 0.7 is instrumental to confirm internal consistency (Nunnally and Bernstein, 1994).

3.3. *Validity*

Hair et al. (2014: 1618) defined construct validity as the extent to which a set of measurement items actually reflect the theoretical latent construct those items are designed to measure. Ahmad et al. (2016) suggest three types of validity required for a measurement model: convergent validity, discriminant validity, and construct validity.

Hence, in order to validate the constructs of the common good dynamics model a confirmatory factor analysis (CFA) was conducted. The method used to estimate parameters in the CFA model was a RDWLS. This method is specifically designed for ordinal data (cfr. Forero et al., 2009; Katsikatsou et al., 2012; Kořar and Kořar, 2015) and it is characterized by using an estimate of the asymptotic covariance matrix of the polychoric correlations as to obtain the correct standard error (cfr. Yang-Wallentin et al., 2010).

To evaluate the goodness of fit of the data in the structural model three com-

mon model-fit measures were used: the root mean squared error of approximation (RMSEA), the comparative fit index (CFI), which may depend on the estimation method used (Xia and Yang, 2018), and the standardized root mean square residual (SRMR), which is robust with respect to the method used to estimate the model parameters (cfr. Shi and Maydeu-Olivares, 2019; Shi et al., 2020). Hu and Bentler (1999) suggested a cutoff close to 0.06 for the RMSEA and a cutoff value close to 0.08 for the SRMR to indicate a good fit, while Byrne (1994) suggested a CFI greater than or equal to 0.90. The convergent validity was evaluated via the average variance extracted (AVE). The AVE measures the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error (Fornell and Larcker, 1981). The AVE is given by

$$AVE = \frac{\sum_{i=1}^k \lambda_i^2}{\sum_{i=1}^k \lambda_i^2 + \sum_{i=1}^k Var(\varepsilon_i)}$$

where k is the number of items, λ_i is the standardized factor loading of item i and $Var(\varepsilon_i)$ is the variance of error of item i . An AVE greater than 0.5 indicates that the variance captured by a construct is greater than the variance due to measurement error, so an acceptable criterion to indicate convergent validity is an AVE greater than or equal to 0.5 (Fornell and Larcker, 1981). To determine convergent validity, we also considered the factor loadings. Anderson and Gerbing (1988) suggested that all factor loadings should be statistically significant.

The AVE given in (4) was also used to evaluate discriminant validity, which helps verify that the indicators of a latent construct are not related to the constructs with which they should not be, in other words, it indicates the extent to which a construct is truly distinct from other constructs (Hair et al., 2014). Fornell and Larcker (1981) recommend checking that the AVE of each construct is greater than the square of the correlations between the construct and the other latent variables in the model or, equivalently, that the square root of the AVE is less than the correlation between any pair of constructs.

The whole analysis was conducted with the statistical software R, version 4.0.2. In particular, the CFA was developed using the lavaan package while the categorical omega and alpha coefficients were computed with the MBESS package.

4. RESULTS

A CFA was conducted in order to measure the validity of the initial model, i.e. Model 1, as proposed in Figure 1. The model fit indices given in Table 1 suggest that the data from Atlixco show a poor fit to Model 1. This is so not just because the CFI index is slightly below the recommended threshold of 0.9 (Byrne, 1994; Hair et al., 2014), but also because four items had negative factor loadings: items

3, 14, and 15 (within the “justice” factor), and item 48 (within the “agency” factor). The latter is unacceptable since we would expect these items to be positively correlated with their corresponding factors. Furthermore, item 7 (within “justice”) was not statistically significant (*vide* Table 7 in Appendix B).

TABLE 1 – *Goodness of fit for Model 1*

<i>CFI</i>	<i>RMSEA</i>	<i>SRMR</i>	ω_c	α
0.89	0.07	0.07	0.92	0.95

Having said that, it is important to notice that Model 1 presented good values of internal consistency or reliability, both in terms of the categorical omega and the Cronbach’s alpha, with values well above the minimum recommended: this suggests Model 1, for Atlixco, is quite useful and relevant, but has room for improvement.

Consequently, in an effort to restate and reiterate the initial model, and mainly because of the negative factor loadings that some items presented with their corresponding factors in Model 1, we re-specified the model and proposed a new one: Model 2. Model 2 accepts the original five constructs under study, but reduces the number of items to 67: items 3, 14, 15, and 48 were eliminated. The correlation between the factors in Model 1 remains in Model 2.

A CFA was conducted to assess the goodness of fit of Model 2. The Model 2 fit indices are given in Table 2 and the standardized estimates and the correlations between all constructs are given in Figure 3. The fit indices suggest a good fit for Model 2. The CFI value for this model was in the recommended limit of 0.9 by (Byrne, 1994; Hair et al., 2014), while the RMSEA and SRMR values were within the limits suggested (close to 0.06 and 0.08, respectively) by (Hu and Bentler, 1999).

TABLE 2 – *Goodness of fit for Model 2*

<i>CFI</i>	<i>RMSEA</i>	<i>SRMR</i>	ω_c	α
0.90	0.06	0.07	0.94	0.97

Model 2 presented high internal consistency, both globally and individually, in each one of its constructs. As can be seen in Table 2, Model 2 globally presented both a categorical omega and a Cronbach’s alpha higher than the recommended minimum. Similarly for each one of the constructs, and according to the results given in Table 3, all presented a good internal consistency.

Regarding convergent validity, the “justice” factor presented an AVE value of 0.32, which was inferior to the recommended minimum value of 0.50 (Fornell and

Larcker, 1981). The four remaining factors, however, presented an acceptable AVE value ranging from 0.50 to 0.66. In addition to this, we analyzed the size of the standardized factor loading. Of the thirteen items that compose the “justice” factor, five of them presented low factor loadings (less than 0.5); nevertheless, of all of them, only the factor loading of item J7 was not statistically significant (for p -value < 0.05). The remaining factor loadings of the “stability” factor ranged from 0.55 to 0.84; those of the “governance” factor, between 0.60 and 0.81; while the “agency” factor ranged from 0.62 to 0.90, and in all these cases the factor loadings were statistically significant. Only the factor loading of the item H61, within the “humanity” factor, was less than 0.5, and all of them were statistically significant (*vide* Table 8 in Appendix B).

TABLE 3 – *Reliability and convergent validity indices*

<i>Factors</i>	ω_c	α	<i>AVE</i>
Justice	0.86	0.80	0.32
Stability	0.92	0.89	0.50
Governance	0.97	0.93	0.55
Agency	0.97	0.92	0.66
Humanity	0.98	0.93	0.55

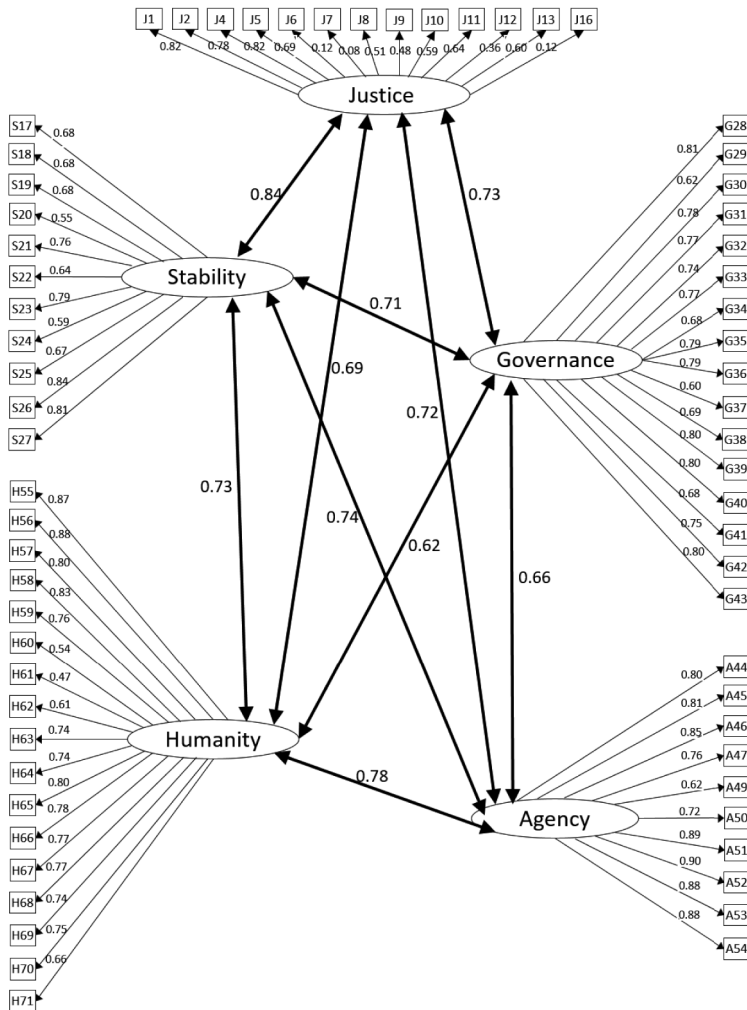
The diagonal values in Table 4 are the square root of the AVE for the construct and other values are the correlations between the respective constructs. “Governance” and “agency” factors presented a good discriminant validity, as the construct’s correlation was inferior to the square root of the AVE (Fornell and Larcker, 1981). “Stability” and “humanity” factors presented a square root of the AVE slightly lower in some construct’s correlations, so it can also be considered that these two factors had complied with the discriminant validity. The square root of the AVE of the “justice” factor was inferior to the construct’s correlation, so this factor presents a discriminant validity problem.

TABLE 4 – *Discriminant validity indexes*

<i>Factor</i>	Justice	Stability	Governance	Agency	Humanity
Justice	0.57				
Stability	0.84	0.70			
Governance	0.73	0.71	0.74		
Agency	0.72	0.74	0.66	0.81	
Humanity	0.69	0.73	0.62	0.78	0.74

To wrap all this up we can say that Model 1, which results only from the Atlix-co data, had altogether some good properties and some issues. Model 2, whose representation is given in Figure 3, showed a good fit, good internal consistency, convergent validity, and a regular discriminant validity: the items that made it to the final instrument can be seen in Table 6 in Appendix A. All of this suggests the instrument is useful and relevant for its intended purpose.

FIGURE 3 – *Standardized estimates and correlations between all constructs of Model 2*



Of course, this is not to say that the instrument *has been* validated, because in order to assert that we would require similar assessments for different sets of data given several applications, and so, future work requires us to measure and compare data from other municipalities; however, following (Xia and Yang, 2018), by considering the fit, reliability coefficients, and convergent and discriminant validity indices obtained from Models 1 and 2, it seems the instrument has room for improvement: in other words, this first analysis serves an auxiliary function toward the validation of the instrument for future applications.

Additionally, these first steps also indicate that, given the correlations shown in Table 4, the hypothesis that all the constructs are correlated with each other cannot be rejected, which is consistent with the claims by Nebel and Arbesu-Verduzco (in this issue) in the sense that the five normative drivers of common good dynamics are not to be considered as isolated, independent elements in so far as they are relational.

APPENDIX A

INSTRUMENTS

TABLE 5 – *Initial instrument items (for Model 1).*

<i>Item</i>	<i>Assertion</i>
J1	In my locality, each person's rights are respected.
J2	In my locality, the police protects me.
J3	In my locality, public officials can be corrupted.
J4	In my locality, work is valued.
J5	Most people in my locality have work.
J6	In my community, we value that everyone can study.
J7	In my locality, anyone can study, should he/she choose to do so.
J8	My locality's cultural traditions are respected by the majority.
J9	In my locality, traditional sayings are understood by the majority.
J10	In my community, if someone is having a hard time, we organize to help him/her.
J11	In my locality, there are places where people can go to get help (e.g., DIF, Red Cross, churches).
J12	In my locality, people are not forced to leave the municipality so as to secure their livelihood.
J13	Municipal government programs benefit the majority of the population.
J14	In my locality, there are social groups that fail to gain access to power.
J15	In my locality, some groups have all the power.
J16	In my daily activities in the locality, I am frequently humiliated.
S17	In my locality, when a thief is caught, we hand him/her over to the police.
S18	In my locality, when someone is arrested, the police treats him/her with respect.
S19	I am proud to talk about my work with others.
S20	Attending school is important to be able to participate in the locality's social life.
S21	I am proud of my community's culture
S22	The younger generations participate in my locality's traditions, customs, and festivities.
S23	When a family member or myself seek help in a local institution, we are treated with respect.
S24	The programs implemented by the municipal government have long-term benefits.
S25	If I buy land or a house, I am confident that the government will respect my property title in the future.
S26	Most associations in my locality have existed for a long time (for example: "mayordomía", "jornales", parent association, "ejido" groups).
S27	The members of associations meet frequently (for instance: "mayordomía", "jornales", parent association, "ejido" groups, etc.).
G28	In this locality the municipal administration is at the service of the majority.
G29	In my locality, most people pay taxes.
G30	The government strives to improve worker's conditions.
G31	The government of my locality actively promotes the creation and maintenance of public spaces such as parks, squares and streets.
G32	In my locality, most people take care of public spaces such as parks, squares, and streets.

- G33 The government provides the conditions for effective solidarity to exist among the citizens of my locality.
- G34 In my locality, the government works so that everyone can finish high school.
- G35 In my locality, the government's authority is respected.
- G36 The municipal government works for the good of the majority.
- G37 When someone takes office, he/she complies with the proposed government plan.
- G38 The government has the will to solve conflicts between different local groups.
- G39 The municipal government is able to reach agreements that benefit the entire community.
- G40 The municipal government seeks that everyone has the same opportunities in the community.
- G41 The municipal government works to ensure that everyone can keep living in the community in the long term.
- G42 The government of my municipality listens to us.
- G43 I can participate in the decisions of my municipality.
- A44 In my locality, it is valued that people organize themselves to solve their problems.
- A45 People take the initiative when they have to solve problems in my locality.
- A46 The neighbors can reach agreements when we have a common problem.
- A47 The neighbors know how to organize ourselves to solve a common problem.
- A48 The laws often prevent us from solving local problems.
- A49 Most of the times, the neighbors achieve the goals we set for ourselves.
- A50 When we face difficult problems, in my community we can get support from other institutions.
- A51 I can express my opinions in the groups wherein I participate.
- A52 Most of the groups in my community contribute to the common good.
- A53 Cooperation between the groups in my locality is possible.
- A54 The groups in my locality cooperate with the government.
- H55 The people in my locality demand me to be responsible for my actions.
- H56 The people in my locality get upset if I do not keep my promises.
- H57 People in my locality get upset if I fail to treat others kindly and respectfully.
- H58 People in my locality get upset if I do not do the right thing.
- H59 In my locality, those who are not solidary to others are frowned upon.
- H60 In my locality, people are honest.
- H61 In my locality, anyone can go out by day without fear.
- H62 People in my locality usually solve conflicts peacefully.
- H63 People in my locality get angry if I do not think before acting.
- H64 People in my locality do not tolerate when someone is mean to others.
- H65 People in my locality expect the best from me.
- H66 People in my locality expect me to be strong when I suffer some misfortune.
- H67 People in my locality expect others to prove their courage in life.
- H68 Most people in my locality express their opinions clearly.
- H69 When talking about important topics, the people in my locality ask that it be done in a serious and objective way.
- H70 People in my locality expects me not to make the same mistake twice.
- H71 People in my locality know how to reconcile after a conflict.
-

TABLE 6 – *Final instrument items (for Model 2)*

<i>Item</i>	<i>Assertion</i>
J1	In my locality, each person's rights are respected.
J2	In my locality, the police protects me.
J4	In my locality, work is valued.
J5	Most people in my locality have work.
J6	In my community, we value that everyone can study.
J7	In my locality, anyone can study, should he/she choose to do so.
J8	My locality's cultural traditions are respected by the majority.
J9	In my locality, traditional sayings are understood by the majority.
J10	In my community, if someone is having a hard time, we organize to help him/her.
J11	In my locality, there are places where people can go to get help (e.g., DIF, Red Cross, churches).
J12	In my locality, people are not forced to leave the municipality so as to secure their livelihood.
J13	Municipal government programs benefit the majority of the population.
J16	In my daily activities in the locality, I am frequently humiliated.
S17	In my locality, when a thief is caught, we hand him/her over to the police.
S18	In my locality, when someone is arrested, the police treats him/her with respect.
S19	I am proud to talk about my work with others.
S20	Attending school is important to be able to participate in the locality's social life.
S21	I am proud of my community's culture
S22	The younger generations participate in my locality's traditions, customs, and festivities.
S23	When a family member or myself seek help in a local institution, we are treated with respect.
S24	The programs implemented by the municipal government have long-term benefits.
S25	If I buy land or a house, I am confident that the government will respect my property title in the future.
S26	Most associations in my locality have existed for a long time (for example: "mayordomía", "jornales", parent association, "ejido" groups).
S27	The members of associations meet frequently (for instance: "mayordomía", "jornales", parent association, "ejido" groups, etc.).
G28	In this locality the municipal administration is at the service of the majority.
G29	In my locality, most people pay taxes.
G30	The government strives to improve worker's conditions.
G31	The government of my locality actively promotes the creation and maintenance of public spaces such as parks, squares and streets.
G32	In my locality, most people take care of public spaces such as parks, squares, and streets.
G33	The government provides the conditions for effective solidarity to exist among the citizens of my locality.
G34	In my locality, the government works so that everyone can finish high school.
G35	In my locality, the government's authority is respected.
G36	The municipal government works for the good of the majority.
G37	When someone takes office, he/she complies with the proposed government plan.
G38	The government has the will to solve conflicts between different local groups.

- G39 The municipal government is able to reach agreements that benefit the entire community.
- G40 The municipal government seeks that everyone has the same opportunities in the community.
- G41 The municipal government works to ensure that everyone can keep living in the community in the long term.
- G42 The government of my municipality listens to us.
- G43 I can participate in the decisions of my municipality.
- A44 In my locality, it is valued that people organize themselves to solve their problems.
- A45 People take the initiative when they have to solve problems in my locality.
- A46 The neighbors can reach agreements when we have a common problem.
- A47 The neighbors know how to organize ourselves to solve a common problem.
- A49 Most of the times, the neighbors achieve the goals we set for ourselves.
- A50 When we face difficult problems, in my community we can get support from other institutions.
- A51 I can express my opinions in the groups wherein I participate.
- A52 Most of the groups in my community contribute to the common good.
- A53 Cooperation between the groups in my locality is possible.
- A54 The groups in my locality cooperate with the government.
- H55 The people in my locality demand me to be responsible for my actions.
- H56 The people in my locality get upset if I do not keep my promises.
- H57 People in my locality get upset if I fail to treat others kindly and respectfully.
- H58 People in my locality get upset if I do not do the right thing.
- H59 In my locality, those who are not solidary to others are frowned upon.
- H60 In my locality, people are honest.
- H61 In my locality, anyone can go out by day without fear.
- H62 People in my locality usually solve conflicts peacefully.
- H63 People in my locality get angry if I do not think before acting.
- H64 People in my locality do not tolerate when someone is mean to others.
- H65 People in my locality expect the best from me.
- H66 People in my locality expect me to be strong when I suffer some misfortune.
- H67 People in my locality expect others to prove their courage in life.
- H68 Most people in my locality express their opinions clearly.
- H69 When talking about important topics, the people in my locality ask that it be done in a serious and objective way.
- H70 People in my locality expects me not to make the same mistake twice.
- H71 People in my locality know how to reconcile after a conflict.
-

REFERENCES

- Ahmad S., Zulkurnain N., Khairushalimi F. (2016). Assessing the validity and reliability of a measurement model in structural equation modeling (SEM). *Journal of Advances in Mathematics and Computer Science*, **15**(3), 1-8
- AMAI (2018). *Niveles Socioeconómicos AMAI*. <https://nse.amai.org/>. Accessed 30 June 2020
- Anderson J.C., Gerbing D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, **103**(3), 411-423
- Bandalos D.L. (2014). Relative performance of categorical diagonally weighted least squares and robust maximum likelihood estimation. *Structural Equation Modeling: A Multidisciplinary Journal*, **21**(1), 102-116
- Borges M. (1999). *Collected Fictions*. Trans. A. Hurley. Penguin Books
- Bunge M. (2006). *Chasing Reality: Strife over Realism*. University of Toronto Press, Canada
- Byrne B.M. (1994). Testing for the factorial validity, replication, and invariance of a measuring instrument: A paradigmatic application based on the Maslach Burnout Inventory. *Multivariate Behavioral Research*, **26**(3), 289-311
- Cronbach L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, **16**(3), 297-334
- Forero C.G., Maydeu-Olivares A., Gallardo-Pujol D. (2009). Factor analysis with ordinal indicators: A Monte Carlo study comparing DWLS and ULS estimation. *Structural Equation Modeling: A Multidisciplinary Journal*, **16**, 625-641
- Fornell C., Larcker D.F. (1981). Evaluation structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, **18**(1), 3
- Green S.B., Yang Y. (2009). Reliability of summed item scores using structural equation modeling: an alternative to coefficient alpha. *Psychometrika*, **74**(1), 155-167
- Hair J.F., Black W.C., Babin B.J., Anderson R.E. (2014). *Multivariate data analysis* (7th ed.). Pearson Education, Harlow
- Hammersley M. (1987). Some notes on the terms validity and reliability. *British Educational Research Journal*, **13**(1), 73-81
- Hu L., Bentler P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, **6**(1), 1-55
- Katsikatsou M., Moustaki I., Yang-Wallentin F., Jöreskog K.G. (2012). Pairwise likelihood

estimation for factor analysis models with ordinal data. *Computational Statistics & Data Analysis*, **56**, 4243-4258

Kelley K., Pornprasertmanit S. (2016). Confidence intervals for population reliability coefficients: Evaluation of methods, recommendations, and software for composite measures. *Psychological Methods*, **21**(1), 69-92

Kođar H., Kođar E.Y. (2015). Comparison of different estimation methods for categorical and ordinal data in confirmatory factor analysis. *Journal of Measurement and Evaluation in Education and Psychology*, **6**(2), 351-364

Nebel M., Arbesu-Verduzco L.I. (in this issue). A metric of common good dynamics. *Rivista internazionale di scienze sociali*

Nunnally J.C., Bernstein I.H. (1994). *Psychometric theory* (3rd ed.). McGraw Hill, New York

Shi D., Maydeu-Olivares A. (2019). The effect of estimation methods on SEM fit indices. *Educational and Psychological Measurement*, **80**(3), 421-445

Shi D., Maydeu-Olivares A., Rosseel Y. (2020). Assessing fit in ordinal factor analysis models: SRMR vs. RMSEA. *Structural Equation Modeling: A Multidisciplinary Journal*, **27**(1), 1-15

Trinchera L., Marie N., Marcoulides G.A. (2018). A distribution free interval estimate for coefficient alpha. *Structural Equation Modeling: A Multidisciplinary Journal*, **25**(6), 876-887

Viladrich C., Angulo-Brunet A., Doval E. (2017). A journey around alpha and omega to estimate internal consistency reliability. *Annals of Psychology*, **33**(3), 755-782

Xia Y., Yang Y. (2018). RMSEA, CFI and TLI in structural equation modeling with ordered categorical data: The story they tell depended on the estimation methods. *Behavior Research Methods*, **51**, 409-428

Yang-Wallentin F., Jöreskog K., Luo H. (2010). Confirmatory factor analysis of ordinal variables with misspecified models. *Structural Equation Modeling: A Multidisciplinary Journal*, **17**(3), 392-423