

**Item nonresponse in cross-national surveys:
a multilevel analysis with emphasis in Latin America**

Delfino Vargas
El Colegio de México

Maria Merino
School of Business
Instituto Tecnológico Autónomo de México

Introduction

Globalization has motivated an increasing interest in conducting cross-national studies in the business and sociological areas. Global brand market research studies and employee attitude surveys in multinational organizations are now widespread, whereas most academics are interested in testing the validity and generalizability of their frameworks and research findings in global basis. Despite its promising contribution, cross-national survey research may be affected by serious threats to validity both by methodological issues inherent to any survey (survey quality) and the comparability of responses from different nations (data equivalence) (Heath et al, 2005). Most of the methodological contributions are focused on the equivalence issue, referring to the extent to which the elements of a research design have the same meaning, and can be applied in the same way, in different cultural contexts (Hult et al, 2008). In this paper, we analyze the implications of a particular dimension of survey quality: *nonresponse error*. This potential bias represents a major concern for most researchers in western societies due to the clear downward trend to participate in surveys. It has also been documented the divergence in response rates across countries (Couper and De Leeuw,

2003; Harzing, 2000). In academic research, average response rates in International Business Journals ranges from 27.45 to 51.2% (Yang et al, 2006). However, little is known about the reasons explaining the difference in response rates and whether differential response rates might result in biased estimates of population parameters (Lyness and Kropf, 2007). This paucity of research is even more alarming for surveys conducted in Latin American countries, since most of the methodological contributions are based on surveys that excluded Latin American samples, such as the studies by Couper and De Leeuw (2003), Hox and de Leeuw (2002) and Lyness and Kropf (2007).

The major concern on response rates is explained by their potential influence on nonresponse bias. This will occur if there is a relationship between nonresponse and survey variables. To illustrate this potential risk of getting biased results, we analyze the impact of nonresponse in the results of globalization assessment in a cross-cultural study. Results from the survey “Voice of the People” published by Gallup International in 2006 concluded that the citizens from the poorest countries assessed globalization positively as having beneficial effects in their nations. Another analysis from the Pew Research Center in 2003 confirms the strong support for globalization among low-income countries. These opinions contradict solid economic research finding that developed economies have benefited more from globalization than developing countries. Part of the reason of this apparent paradox comes from the reporting analysis of globalization assessment rates because they do not generally check the magnitude of nonresponses.

Therefore, the purpose of this study is to understand the determinants of item nonresponse in the context of a cross-cultural study and to introduce a multiple imputation strategy to correct the nonresponse bias. We conduct this analysis in the context of a cross-cultural study on attitudes toward globalization by citizens from 45 countries, including 8 Latin-American nations.

Nonresponse rates and nonresponse bias

Nonresponse occurs when a sampled unit does not participate in the survey (*unit nonresponse*) or when the unit responds to the survey but fails to provide information on at least one survey variable or item (*item no response*). The focus of our analysis is on item non response, since most of the above mentioned contributions dealing with nonresponse in cross-cultural studies have focused on unit nonresponse.

The decision to respond to a certain question is driven by the following factors (Beatty and Herrmann, 2002): a) cognitive state (availability of the information requested); b) adequacy judgements (the respondent's perception of the level of accuracy required by the questioner); and c) communicative intent (the respondent's motivation to provide the information requested). In the case of a survey on opinions related to the impact of globalization on citizens' lives, participants may not provide a response unless she fully understands the term of globalization. Alternatively, participants may decide not to answer the question because of the absence of perceived interest in globalization.

The potential influence of motivation to respond has raised the issue of the validity of item nonresponse, questioning to what extent respondents, who choose the no opinion option, in fact do not have an opinion on the topic. To solve the validity issue, several researchers have analyzed the correlates of item nonresponse. Among the factors that can identify individuals least likely to express no opinion are education, knowledge about the topic, interest in the topic, affective involvement in the topic, confidence in one's ability to form an opinion on the topic, and perceived utility of forming an opinion on the topic (Krosnick and Milburn, 1990).

From a cognitive psychology perspective Sudmand and Bradburn (1982) focus on aspects of questionnaire construction that include context, order, wording, time in order to decrease the likelihood of nonresponse. When a respondent increases the time of response it is likely he/she does not understand the questions for some reason. Another relevant approach is to consider the social exchange theory as an explanation of the lack of interest on the survey topic, as suggested by Dillman (1978). Social exchange theory applied to surveys, states that respondents establish a non-written contract with the researcher to provide information requested in the survey, based on a social interchange. Possibly this social interchange has the form of a material gift or an intangible benefit when the study is finished.

Most of the item nonresponse studies have concentrated on the influence of respondent characteristics, particularly education and socioeconomic status on the lack of response to specific items (Shoemaker et al, 2002). This approach seems incomplete when dealing with cross-national studies due to the potential influence of contextual social factors at the country level. Even the notion of culture itself suggests that

cultural conditioning may influence the cognition of survey respondents, as the definition provided by Triandis (1996, p.2) conceptualizing culture as “the shared elements that provide the standards for perceiving, believing, evaluating, communicating, and acting among those who shared a language, a historic period and a geographic location”. Some authors have analyzed the impact of national culture on communication styles that are highly relevant to understand item nonresponse (Johnson et al, 2002). The dimension of high versus low-context cultures proposed by Hecht et al (1989) suggest that high-context cultures interpret messages not only from their explicit content but also as a function of nonverbal environmental cues and inferred meanings. These high-context cultures (such as Latin Americans) are more resistant to self-disclosure and this lack of acceptance of direct questions may be related to non-response.

Our main goal is to rank countries perceptions on globalization taking into account the nested structure of the data and non response. In order to test the influence of country characteristics on individual response rates, it is necessary to conduct multilevel analysis that take into account the lack of independence among citizens of the same country and also examine the influence of the interaction between individual-level and country-level predictors. For the same reasons, we also adopted the same multilevel approach to the substantive analysis aimed at evaluating the globalization assessment by citizens from a wide sample of countries.

Data and Variables

The 2003 Pew Global Attitudes project surveyed more than 38,000 respondents in 45 countries on their attitudes towards globalization. A number of the survey questions related directly to economic life, while other questions explored related aspects of globalization. There was a certain amount of repetition in the questions, generating highly collinear response patterns (for example, respondents were asked both whether they regarded an expansion in cross-border exchange as good for their family and good for their country). From this survey, 8 questions were identified *ex ante* without any kind of pre-testing as possibly conveying relevant information towards globalization. These statements were phrased in agreement/disagreement form and respondents were asked to indicate whether they strongly agreed, somewhat agreed, somewhat disagreed, strongly disagreed, did not know, or had no response. The best opinion of globalization-related aspect is coded as 4, whereas the worst opinion is coded as 1. Therefore, higher scores would indicate a positive assessment of globalization. The specific questions are listed in the Appendix.

Given the similarity in several questions and therefore, the highly collinear response patterns observed in the database, we decided to conduct a confirmatory factor analysis that generated the following three factors:

Connect as the average of four items: questions 24 (Growing business ties, good for country), 25 (Faster communication and travel), 28 (Connected world) and 29 (Growing business ties, good for family). Therefore, this factor indicates connection through greater economic trade and faster communication.

Access as the average of two items: questions 26 (movies, TV and music from different parts of the world are now available in their country, goof for the country) and 30 (the same statement but this question asks for the goodness to the respondent's family).

Global corresponds to a sole question, asking if globalization is a very good thing, somewhat good, somewhat bad or a very bad thing.

Due to the fact that we need a sole dependent variable, an index was constructed by these three factors, suggesting the factor analysis that the three dimensions are integral components of the same concept with the following loadings:

$$\text{Globalization} = (\text{connect} + 0.861 * \text{access} + 0.866 * \text{global}) / (1 + 0.861 + 0.866)$$

We included as macro level variables both measures (referred to the country where the respondent lived) and at the individual level measures (that were included in the Pew database) that are described in the following section.

Macro or Country-level Control Variables

In studies of international political economy, globalization is frequently measured by the extent of free trade, financial openness, economic development and open immigration policies that are exclusively focused on economic aspects. However, globalization has a wider and deeper influence on both nations and individuals, so we decided to adopt the multidimensional globalization measure developed from a sociological point of view called GlobalIndex (Raab et al, 2008). This is a new and innovative aggregated index measure designed to capture the phenomenon of globalization on four separate dimensions that are described below:

- Economic Globalization:
 - Financial Flows: Trade (% of GDP), Foreign Direct Investment, (% of GDP), Personal Remittances (% of GDP).
 - Economic Restrictions: Mean Tariff Rate, Hidden Import Barriers
- Socio-Technical Globalization,
 - Personal Contact: Telephone Traffic, International Tourism, Transfers
 - Information Flows: Internet hosts and users
- Cultural globalization
 - Logic of Expansion: % Urban population, Domestic Expenditure on R&D
 - Values: Gender Parity for Gross Enrollment Ratio, % of female graduates in Tertiary Education.
- Political Globalization.
 - Participation in UN Security Missions, Membership in International Organizations

To calculate the index, all the figures were panel-normalized. We consulted several information sources such as World Bank, UNESCO, ITU World Telecommunications Indicators, CIA, U.N., World Development Indicators)

Individual-level Variables

As for subject-related factors that may influence personal attitude toward globalization, we included the following variables that were part of the Pew database: *Education level*, it has been shown that support for trade restrictions is highest among respondents with the lowest level of education because exposure to economic ideas and information among college-educated individuals plays a key role in shaping attitudes toward trade and globalization (Hainmueller and Hiscox, 2006). Therefore, we included education as a standardized measure across countries since the education variable presented different levels across countries in the original database. Specifically, we converted the country-specific education levels to the ISCED classification proposed by UNESCO. *Gender*, because of child-birth, child-rearing, and discrimination, women also face a more precarious labor market worldwide than men. Therefore, women may prefer protection from the vicissitudes of the global market (Hiscox and Burgoon, 2003). *Age*, younger generations are generally expected to be more favorable to globalization because they tend to be more educated in foreign languages, have more exposure to global news media and entertainment, and travel to foreign countries more often and widely than older cohorts. Additionally, access to international sites through internet, popular cultural icons and global consumer brands connect young people living in different countries nowadays than in the past. In fact, these experiences of younger generations can contribute to the formation of positive outgroup images that foster the identification with such foreign groups (Howard, 2000). *Personal Income*, this variable was measured as an index that standardized the different levels across countries in the original database. *Computer Ownership*, having a computer facilitates

permanent access to the Internet, representing a key factor in fostering the cultural convergence among countries. Individuals making regular use of Internet will probably accelerate their cultural convergence (Martinez Lopez and Sousa, 2005). *Access to International TV channels*, one of the questions included in the survey asked respondents if they watch an international news channels, citing examples specific to each country. *Free market*, respondents were asked if people are better off in a free market economy, even though some people are rich and some are poor. *Internet use*, respondents were asked if they ever go online to access the Internet or World Wide Web or to send and receive email? *Urban setting*, the survey includes a variable that categorizes urban setting coded as 1, and rural coded as 0 (includes suburban and rural). The variable *digital* was built as the summation of computer ownership, access to international channels, use of computers and internet use. This variable measures the extent of usage of digital technologies, we expect that the higher the score on digital the more likely will respond to the question on globalization.

Strategy of Analyses

Because one of the objectives of this study is to compare consumers' opinions of globalization across 45 countries, we propose to rank the countries using a multilevel model that . In addition, we studied the nonresponse mechanism and used multiple imputations approach to deal with missing data. In the following sections we define the nonresponse model that will allow us to predict the missing data on the globalization item, the multiple imputation approach that will create a complete dataset and finally the multilevel model used for ranking countries

Non response model

To study the nonresponse decision, we fitted a logistic multilevel model where the response variable was coded as 1 if the subject responded to the variable global as explained previously, and 0 for the nonresponse. The predictor variables at included in this model al Level-1 were age, gender, education, free market, digital (includes computer ownership, access to international channels and internet use) and urban. In addition we included quadratic terms of the variables digital and education (Kim, 2006). We acknowledged the nested structure of the data by allowing Level-2 variables to be random for the countries intercepts. No further variables were included at this level since the analytic model for the response variable globalization includes macro level variables at the country level and we want to avoid over parameterization of the model (see equation 1).

$$\begin{aligned}
 &\text{Level -1} \\
 &\text{logit}(p_{ij}) = \beta_{0j} + \beta_{1j}age + \beta_{2j}education_i + \beta_{3}free\ market + \\
 &\quad \beta_4digital_i + \beta_5urban_i + e_{ij} \qquad (1) \\
 &\text{Level - 2} \\
 &\quad \beta_{0j} = \alpha_{00} + u_{0j}
 \end{aligned}$$

This model allowed us to test the predictor variables for the nonresponse mechanism. We used STATA 10 for fitting a multilevel logistic regression using the command `xtmelogit`, the propensity scores for nonresponse were saved for further analysis.

Missing Data Mechanisms

Once the Propensity Scores (PS) model for nonresponse was fitted, we proceeded with the imputation step and obtained the rankings based on the multilevel model.

Additionally, we obtained the rankings using a multilevel model without imputations to compare the results.

For the imputation step we need to understand the assumptions made for the imputation step and review the missing data mechanisms as defined in the literature (Rubin, 1987). One basic concept in data imputation is the mechanism of *ignorability*, the theoretical basis that explains the causes of missing data. Ignorability includes three complementary concepts missing completely at random (MCAR), missing at random (MAR), and non-ignorable (NI) missing (Rubin, 1976).

The MCAR situation means that the mechanism that governs the missing data is not related either to the observed or missing data. The MCAR mechanism is equivalent to deleting a random subsample from a hypothetical population in which each observation has equal probability of being selected for deletion. The second mechanism is “missing at random” (MAR), this mechanism states that the distribution of the missing data does not depend on the missing values but only on what we observe. In other words, the missing data mechanism can be found in the data observed. Under the NI mechanism a set of non-observed covariates explain the missing pattern and it is not related to the observed variables. For example, if an individual with a very high income was unable to provide his/her income because of fear to report such an income and we do not record any other variable to explain the incomplete data, we say the mechanism is NI. In other words the information regarding income could be NI missing if the higher the income the higher the probability to be incomplete and nor covariate is available to explain the missing data mechanism. This pattern is the most difficult to

treat analytically and Markov Chain Monte Carlo Methods (MCMC) could be one way to deal with these scenarios.

MCAR patterns are very rare in the real world and survey researchers can take advantage of this pattern. The MAR scenarios are more common in real practice. Fortunately, NI scenarios are less common. Under MAR assumption a set of covariates is observed and the missing values depend on the observed variables. There is no statistical test to prove this assumption; however, a common approach to see if MAR assumption is plausible is to determine if the covariates are correlated with the dependent variable, either observed or missing (e.g. via logistic regression or chi-square test).

We used the MAR assumption for this study and determine a number of variables for the imputation model based on the multilevel logistic regression model for nonresponse. Graham and Schafer (1999) showed that parameter estimates exhibit less bias from population parameter estimates as the number of covariates included in the imputation model increase. Therefore, the strategy we will use in this study is to incorporate into the imputation model the variables that show some ability to predict the mechanism of missing data based on the multilevel logistic regression model. The analytic model may not include all the variables used in the imputation model; but all variables, which are to be used in the analytic model, need to be included in the imputation model.

Multiple Imputations

Multiple imputations (MI) incorporate a simulation process to fill-in several missing values since a single one might not reflect the variability. The variability results from the simulation process where missing data are filled after several iterations. MI are generated using MCMC methods from which several complete versions of the variables in the imputed data set are generated; each data set can be submitted to the analytical model using standard methods.

In order to decide the number of imputed data sets we used the formula of the relative efficiency (RE). Since we have 51% of incomplete information for the analytic model, then for $k=5$ imputed data sets the expected relative efficiency for recovering missing values will be close to 91% (i.e. $(1+0.51/5)^{-1} \times 100$).

Once we generate five versions of the complete data set we can fit five multilevel models as described in the next paragraph, in equation (2). A final step for reporting the results in a single model is to apply Rubin's rules to pool the estimates from the imputed data sets (Rubin, 1987). We used PROC MI implemented in SAS that conducts the multiple imputation step (see further details in Vargas, Decker, Schroeder, & Offord, 2003).

Multilevel Model

A multilevel analysis was used due to the heterogeneous aspects of globalization across countries and specifically since our data contains two levels of information: macro-level structural changes resulting from globalization and (country level) micro-level

variables (individual level). Perceptions of globalization occur at individual level, whereas cultural and macroeconomic characteristics occur at country-level. Such data are designated as multi-level data because customers are nested within countries.

The analytical strategy to investigate hierarchically ordered systems has been a concern for a number of disciplines for quite some time. Conventional statistical techniques (e.g., ordinary regression analysis) ignore this hierarchy and independence of units within each cluster, therefore, may lead to incorrect results (Raudenbusch and Bryk, 2002). On the contrary, hierarchical linear models, also called multi-level models, are an effective approach to deal with hierarchically nested data structures. Furthermore, a multi-level model allows for estimation of cross-level effects (i.e., the interactive effects of individual- and country-level variables). This is possible, because the coefficients of the individual-level effects may be specified as random, partially explained by country-level variables.

Our model incorporates two levels of aggregation. At the highest level, level-2 contains 45 countries. At level-1, there are 38263 individual data. The multilevel model is described as follows:

$$\begin{aligned}
 & \textit{Level - 1} \\
 & Y_{ij} = \beta_{0j} + \beta_{1j}X_i + \varepsilon_{ij} \\
 & \textit{Level - 2} \\
 & \beta_{0j} = \alpha_{00} + \alpha_{01}Z_i + u_{0j} \\
 & \beta_{1j} = \alpha_{10} + \alpha_{11}Z_1
 \end{aligned} \tag{2}$$

The response variable is Y_{ij} , the globalization variable obtained through factor analysis of 8 variables included in the survey and six additional background variables

used, as described previously. Level-1 variables included socioeconomic aspects as well as access to internet and international TV channels, in addition to gender education, and income, all variables are represented by X . On the other hand, level-2 variables contains four national culture variables and two background variables measuring the digital and analogue product density across countries, these variables are represented by Z . We modeled the intercept as random, since we assume that the country means vary randomly. For conducting the multi-level analyses, we then used the PROC MIXED procedure implemented in SAS computer program (Entreprise version 4).

Results

For illustration, nonresponse rates were calculated for each country. Latin American nonresponse rates are shown in Table 1.

----- Insert Table 1 here-----

Mexico and Argentina exhibit the highest nonresponse rates, whereas Guatemala and Venezuela have the lowest percentages of individuals omitting these questions.

The results from the nonresponse model are shown in Table 2, where the binary outcome variable is to respond to questions on globalization, coded as 1 (nonresponse is then coded as 0).

----- Insert Table 2 here -----

We found that age has a negative coefficient ($p < .001$), suggesting that young people tend to respond more to the questions related to globalization than older people. Education is positive ($p < .001$), so that the likelihood to respond increases as education scores increase, confirming previous empirical results that individuals with better cognitive states are more likely to respond survey items. A negative and significant ($p < .001$) coefficient for free market variable indicates that people who score high (and think that free market economy is good for the country) tend to decrease the likelihood of responding to the questions related to globalization. The most relevant finding is the impressive role played by access to digital media (computer ownership, access to international channels and internet use) on the likelihood of responding globalization questions. This finding is consistent with the literature on informational age that has documented the “digital divide”, meaning increasing inequality in digital access. Those that have regular access to the Internet and international TV channels will be more exposed to the term globalization, and therefore, in a better position to respond to questions related to globalization.

It is critical to note that this model suggests some set of variables explain the mechanism of nonresponse that are also significant in the main model (globalization assessment), suggesting that the MAR condition is tenable (Schafer, 1997).

The multiple imputations procedure allowed us to create five imputed data sets that were analyzed using the model as specified in equation 2. The findings are shown in Table 3 where pool estimates from the five multilevel models are presented.

----- Insert Table 3 here-----

These estimates for the reduced model indicate that the main country characteristics influencing attitudes toward globalization are Education (measured as the percentage of Gender Parity for Gross Enrollment Ratio, % of female graduates in Tertiary Education). We found a somewhat paradoxical effect in this variable, because its effect on attitude toward globalization is negative. Close inspection of the means by country showed that some of the countries with the best attitude (such as Ivory Coast, Bangladesh, Uganda and Tanzania) are ranked at the bottom of Higher Education index. This result may indicate that a variable that is more closely related to quality in Education could be more informative

As expected, age has a negative effect on the dependent variable since young individuals have a better perception of globalization in countries where a high percentage of their young people are enrolled in higher education. In the same token, those consumers who own computers and have access to International TV channels are positively related with high scores on globalization, confirming again the impact of the digital divide. The effect of individual income on the attitudes toward globalization is positive in countries where there is a high exposure to the Internet. Finally, education at the individual level has a definitive impact on improving the attitude toward globalization as expected.

This model decomposes the variance of the intercept and the background variables into two independent random components, namely τ_{00} at the individual level and τ_{01} at the country level. Therefore, the intraclass correlation (ICC) indicates the proportion of the variance in the individual attitude towards globalization that occurs at the country level

$$ICC = \frac{\tau_{01}}{\tau_{01} + \tau_{00}}$$

In our case the $ICC = .023 / (.023 + .243) = .09$, meaning that the shared variance between two randomly selected subjects living in the same country is 9%, which is a very high figure, bearing in mind that the only link they have in common is the country. On these grounds, we might conclude that there is some evidence for a possible country contextual phenomenon shaping a common individual attitude toward globalization. This high value of the ICC informs us that countries are very important in understanding individual differences regarding attitudes toward globalization.

The model produces a new ranking that is shown graphically in Figure 1. Countries are ranked according to the mean globalization attitude obtained via the hierarchical multilevel model with five imputed datasets. The bars around each country residual represent the 95% confidence intervals.

----- Insert Figure 1 here-----

As far as Latin American countries is concerned, there were significant differences between the estimated and raw means, estimated means with HLM and no imputation and HLM with imputation. The results from the HLM model with imputation, adjusts to more negative attitudes in Bolivia Guatemala, Argentina and Peru; the countries in the middle score are Brazil and Mexico, whereas more favorable scores were observed in Honduras and Venezuela (see Table 4). In addition, we could observe that scores using imputed data a relatively closer to the raw scores than those from the non imputed data.

----- Insert Table 4 here-----

As for the rest of the world, the estimated means for each country were also significantly higher than the raw means representing a more skeptical view of the globalization than it was initially thought.

For the non imputed data the rankings were somehow different (see Figure 2). However, countries remained practically in similar places within quartiles. For example, still we have more negative attitudes toward globalization in Bolivia Guatemala, Argentina and Peru; the countries in the middle score are Brazil and Mexico, whereas more favorable scores were observed in Honduras and Venezuela (see Table 4). The difference is that the actual estimates for the non imputed are somehow affected because of the missing values.

----- Insert Figure 1 here-----

----- Insert Figure 2 here-----

Conclusions

Given contrasting points of view regarding the globalization's benefits and extent of progress, specifically in developing countries, it is extremely relevant to understand public opinion on these issues. Even though there has been several studies documenting public opinion on globalization, their conclusions have been based on analysis ignoring the nonresponse rates. It is critical to underscore that these missing responses are not distributed randomly across individuals and countries, and therefore some correction for nonresponses must be incorporated. In our analysis, we found that some of the variables explaining the decision to omit the response to the globalization questions are also critical for the evaluation of globalization. Therefore, ignoring the effect on missing values leads to biased estimates of globalization assessments.

In this study we build a ranking of countries based on their populations' assessment of contributions. We conducted a multi-level analysis and multiple imputation to correct for nonresponse to adequately respond to the heterogeneous aspects of globalization across countries and specifically our interest in linking macro-structural changes resulting from globalization on individual attitudes.

The results show dramatic differences across regions of the world. The main factors affecting the personal attitudes regarding globalization are not only individual, but they also share important characteristics with other nationals of the same country.

The relatively high value of the Intra Class Correlation index informs us that countries are very important in understanding individual differences regarding attitudes toward globalization.

We found a divergent opinion on globalization across Latin-American nations, not only in the favorability of the opinions but also in their strength. It is important to point out that the high percentages of nonresponse observed in several Latin-American countries may signal the weakness of public opinion on globalization issues, as suggested in other studies (Dodd and Svalastoga, 1952). In general terms, Latin American citizens expressed a relatively negative opinion of globalization, compared to other regions of the world, even when the multilevel corrections were included in the model.

These findings are relevant both for managers and public authorities and may indicate a feeling of public disappointment with the promises offered by globalization proponents.

Finally, we observed the fundamental role that access to digital media and information has on opinions and participation in a global world. Inequality in access to information may result in inequality of social and economic opportunities and this hypothesis seems a fruitful area to explore, specifically in the context of Latin America.

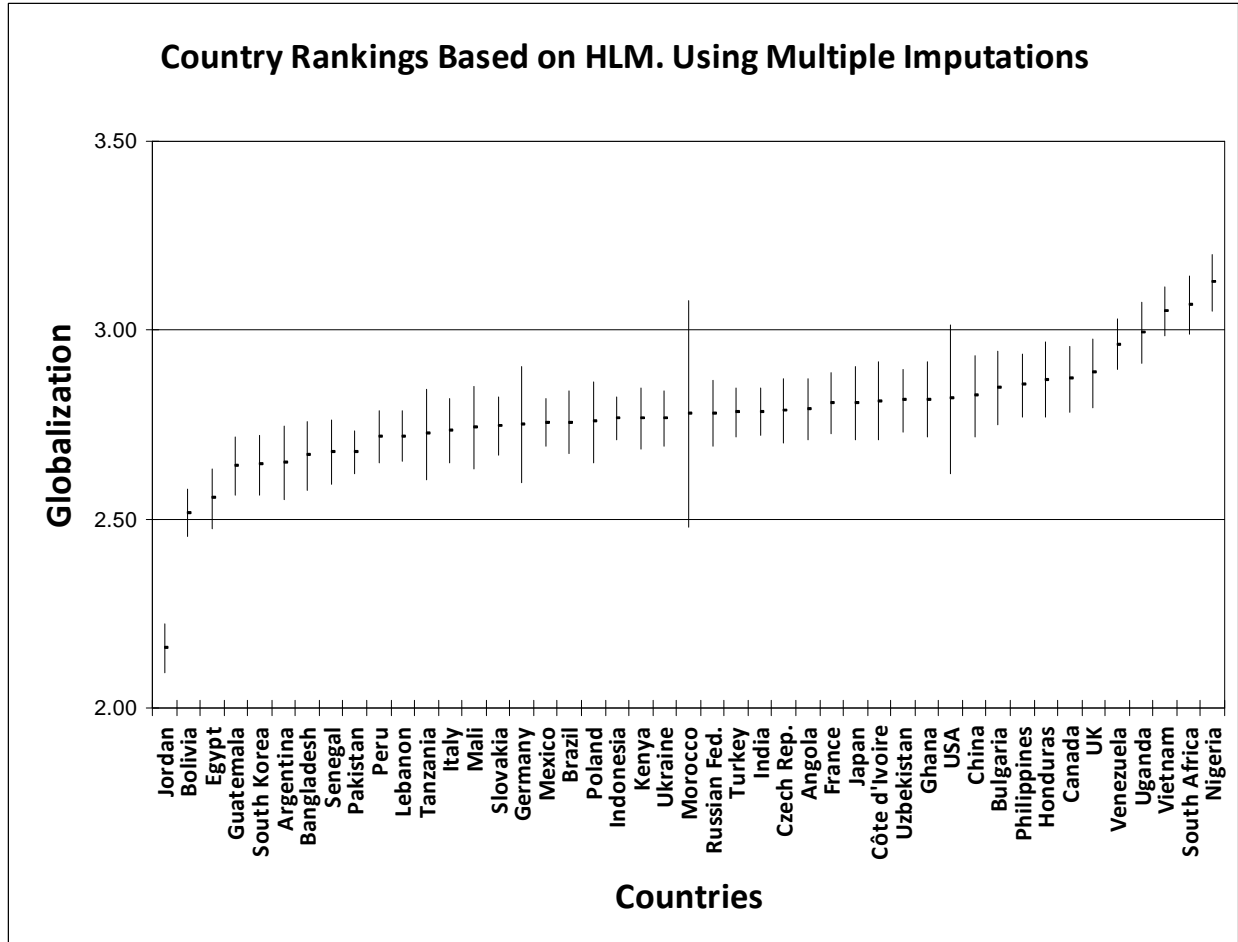


Figure 1. Random intercepts predictions and approximate 95% confidence interval versus ranking (country identifiers). This figure was obtained using five imputed datasets.

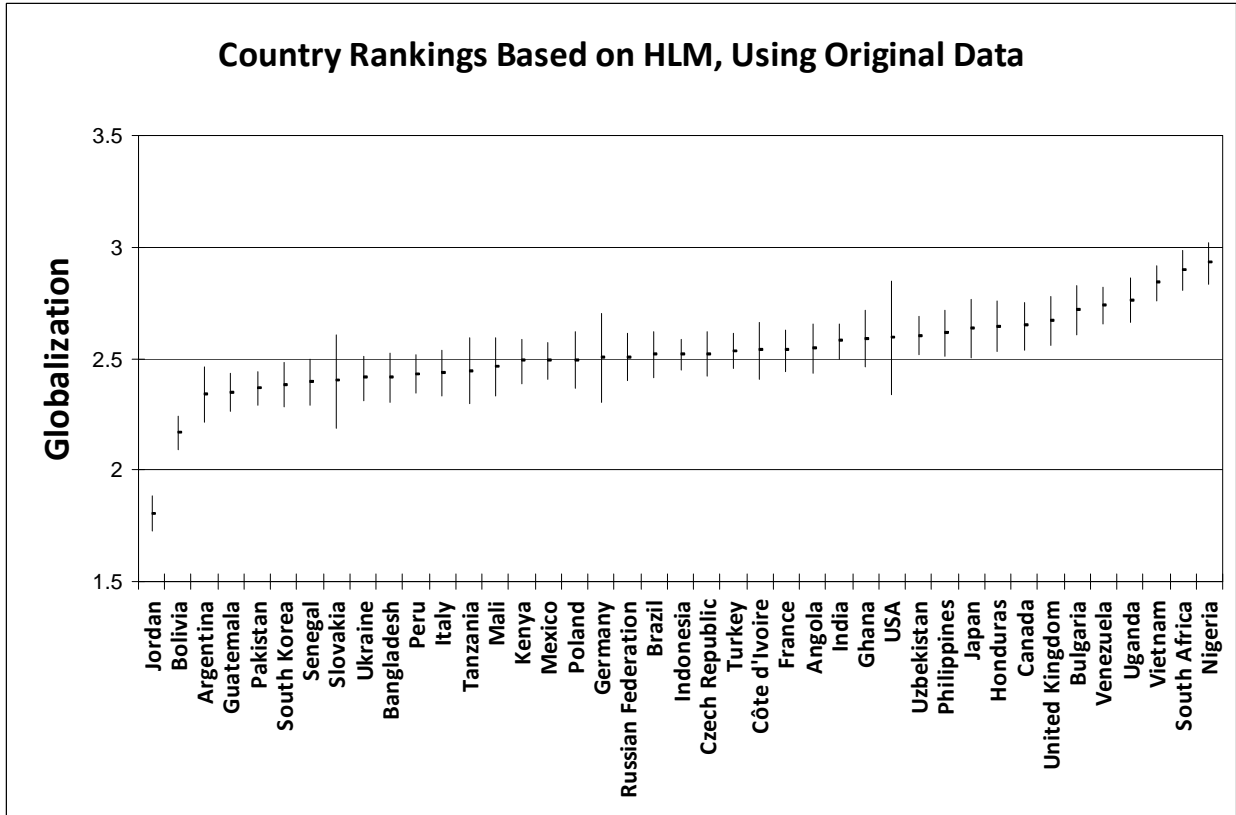


Figure 2. Random intercepts predictions and approximate 95% confidence interval versus ranking (country identifiers). This figure was obtained using original data set and no imputation.

References

- Beatty, P., Herrmann, D. (2002). To answer or not to answer: Decision processes related to survey item nonresponse, in: Groves, R. M., Dillman, D. A., Eltinge, J. L., Little, R. J. A. eds. , *Survey Nonresponse*, John Wiley & Sons, New York
- Dillman, D.A. (1978). *Mail and telephone surveys: The total design method*. New York: Wiley.
- Dodd, S.C. and Svalastoga, K. (1952). On estimating latent to manifest undecidedness: The “Don’t know” percent as a warning of instability among knowers. *Journal of Educational and Psychological Measurement*, 12, pp. 467-471
- Eisenberg, P. and Wesman, A.G. (1941). Consistency in response and logical interpretation in psychoneurotic inventory items. *Journal of Education Psychology*, 32, pp. 321-338
- Hecht, M.L, Andersen, P.A., Ribeau, S.A (1989). The cultural dimensions of nonverbal behavior, in Asante, M.K, Gudykunst, W.B., Newmark, E. (Eds), *Handbook of International and Intercultural Communication*, Sage, Newbury Park, CA, pp.163-85
- Hult,T., Ketchen D., Griffith D., Finnegan C., Gonzalez-Padron T. , Harmancioglu N., Ying Huang , Talay B. and Cavusgil T. (2008). Data equivalence in cross-cultural international business research: assessment and guidelines. *Journal of International Business Studies* , 39, 1027–1044.
- Graham, J.W. and J.L. Schafer (1999). On the performance of multiple imputation for multivariate data with small sample, in *Statistical strategies for small sample research*, R.H. Hoyle, Editor, SAGE publications, Inc.: Thousands Oaks, CA. p. 1-29.
- Groves, R and M. Couper (1998), *Nonresponse in Household Interview Surveys*, New York, USA, Wiley-Interscience.
- Groves, R., D. Dillman. J. Eltinge, R. Little (2002), *Survey Nonresponse*, New York, USA, Wiley-Interscience,
- Khiabany, G. (2003). Globalization and the Internet. Myths and Realities. *Trends in Communication*, 11 (2), 137-53
- Krosnick, J. A., & Milburn, M. A. (1990). Psychological determinants of political opinionation, *Social Cognition*, 8, 49-72
- Lyness, K., & Kropf, M. . (2007). Cultural Values and Potential Nonresponse Bias: A Multilevel Examination of Cross-National Differences in Mail Survey Response Rates. *Organizational Research Methods*, 10 (2), 210-23
- Raab, M. , M. Ruland, B. Schönberger, H. Blossfeld, D. Hofäcker, S. Buchholz and P. Schmelzer (2008): GlobalIndex – A sociological approach to globalization measurement. *International Sociology* 23,4, pp. 596-631.

- Raudenbush, S. W. & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Sage Publications: Thousand Oaks, CA. Second edition.
- Rubin, D.B. (1976). Inferences with missing data. *Biometrika*. **63**(3): p. 581-592.
- Rubin, D.B. (1987) *Multiple imputation for nonresponse in surveys*. New York, USA: John Willey & Sons.
- Schafer, J. L. (1997). *Analysis of incomplete multivariate data*. New York: Chapman Hall.
- Shoemaker, P.; Eichholz, M; Skewes, E. (2002). Item nonresponse: distinguishing between don't know and refuse. *International Journal of Public Opinion Research*, 14(2), p193-201
- Sudman, S., & Bradburn, N. M. (1982). *A practical guide to Questionnaire Design*. San Francisco, CA: Jossey-Bass, Inc. Publishers.
- Triandis, H.C. (1996). The psychological measurement of cultural syndromes. *American Psychologist*, 51 pp 407-415
- Vargas Chanes, D., Decker, P. A., Schroeder, D. R., & Offord, K. P. (2003). *An introduction to multiple imputation methods: handling missing data with SAS V8.2*. Mayo Clinic Foundation Report no 67, available at <http://mayoresearch.mayo.edu/mayo/research/biostat/upload/67.pdf>

Table 1. Nonresponse rates for Latin American countries

Country name	Non response rate
Overall	31.73
Mexico	45.28
Argentina	44.35
Brazil	32.17
Peru	30.94
Brazil	29.00
Bolivia	24.94
Guatemala	20.80
Venezuela	10.00

Table 2. Logistic multilevel ML estimates for the nonresponse model

Parameter	Estimates (Err. Std.)
Constant	0.728*** (0.149)
Age	-.008*** (0.0009)
Education	0.294*** (0.053)
Free market	-0.124*** (0.015)
Digital	0.475*** (0.028)
Urban	0.133*** (0.034)
Variance Components	
Country Level (σ_{01})	0.746 (0.166)
Individual Level (σ_{00})	3.289
-2 × Log Likelihood	30449.0

Note: table entries are maximum likelihood estimates, standard errors are in parenthesis.

* $p < 0.5$; ** $p < 0.01$; *** $p < 0.001$

Table 3. Hierarchical linear models ML estimates for globalization data using multiple imputations.

Parameter	Null Model	Full Model	Reduced Model
Constant	3.036 *** (0.159)	2.756. *** (0.064)	2.770*** (.072)
Ecoglobal	--	-0.022 (0.013)	-0.022 (.013)
Cultural Global	--	-0.042*** (0.010)	-.040*** (.011)
Gender		0.023 (0.013)	--
Ecoglobal	--	-0.001 (0.003)	--
Cultural Global	--	0.003 (0.002)	--
Age		-0.002** (0.001)	-0.002*** (0.001)
Ecoglobal	--	0.0001* (0.0001)	--
Cultural Global	--	0.0001 (0.0001)	--
View International		0.082*** (0.017)	0.076*** (0.017)
Ecoglobal	--	-0.003 (0.003)	--
Cultural Global	--	0.003 (0.003)	--
Computers		0.063** (0.021)	0.057* (0.025)
Ecoglobal	--	-0.001 (0.003)	--
Cultural Global	--	-0.006 (0.004)	--
Income		0.024* (0.009)	0.022* (0.007)
Ecoglobal	--	0.001 (0.001)	--
Cultural Global	--	0.001 (0.001)	--
Education		0.059*** (0.009)	0.057*** (0.009)
Ecoglobal	--	0.009*** (0.001)	0.009*** (0.001)
Cultural Global	--	0.001 (0.001)	--
Variance Components			
Country Level (σ_{01})	0.030 (.006)	0.023 (0.005)	0.024 (.005)
Individual Level (σ_{00})	0.251 (.002)	0.243 (.002)	.243 (.002)
-2 × Log Likelihood	55825.7	54643.8	54633.9

Note: table entries are maximum likelihood estimates based on 5 multiple imputed data sets.

Standard errors are in parenthesis and calculated using Rubin's Rules (1987).

* p < 0.5; ** p < 0.01; *** p < 0.001

Table 4. Comparison of Raw and Estimated Scores for Latin American Countries

	Raw Mean	Estimated Mean Non Imputed	Ranking Non Imputed	Percentile Non Imputed	Estimated Mean Imputed	Ranking Imputed	Percentile Imputed
Honduras	3.14	2.63	8	82.5%	2.87	7	84.0%
Venezuela	3.29	2.74	4	90.0%	2.96	4	75.0%
Brazil	2.98	2.46	21	52.5%	2.76	27	38.6%
Mexico	3.07	2.49	25	37.5%	2.76	28	36.3%
Peru	3.00	2.41	30	25.0%	2.72	35	20.4%
Argentina	2.80	2.33	38	7.5%	2.65	39	11.3%
Guatemala	3.01	2.35	37	5.0%	2.64	41	6.8%
Bolivia	2.78	2.17	39	2.5%	2.52	43	2.2%

Appendix

Questions included in the Pew Survey

Q24 What do you think about the growing trade and business ties between (survey country) and other countries – do you think it is a very good thing, somewhat good, somewhat bad or a very bad thing for our country? (If face-to-face: SHOW CARD)

- 1 Very good
- 2 Somewhat good
- 3 Somewhat bad
- 4 Very bad
- 5 Don't know (DO NOT READ)
- 6 Refused (DO NOT READ)

Q25 And what about the faster communication and greater travel between the people of (survey country) and people in other countries – do you think this is a very good thing, somewhat good, somewhat bad or a very bad thing for our country?

Q26 What about the way movies, TV and music from different parts of the world are now available in (survey country) – do you think this is a very good thing, somewhat good, somewhat bad or a very bad thing for our country?

Q27 And what about the different products that are now available from different parts of the world – do you think this is a very good thing, somewhat good, somewhat bad or a very bad thing for our country?

Q28 All in all, how do you feel about the world becoming more connected through greater economic trade and faster communication – do you think this is a very good thing, somewhat good, somewhat bad or a very bad thing for our country?

Q29 Now thinking about you and your family – do you think the growing trade and *business ties* between our country and other countries are very good, somewhat good, somewhat bad or very bad for you and your family?

Q30 And do you think that having the opportunity to watch movies and TV and listen to music from different parts of the world is very good, somewhat good, somewhat bad or very bad for you and your family?

Q33 There has been a lot of talk about globalization these days. Do you think that globalization is a very good thing, somewhat good, somewhat bad or a very bad thing?