

Symbol Digit Modalities Test: Normative data for the Latin American Spanish speaking adult population

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Abstract.

OBJECTIVE: To generate normative data on the Symbol Digit Modalities Test (SDMT) across 11 countries in Latin America, with country-specific adjustments for gender, age, and education, where appropriate.

METHOD: The sample consisted of 3,977 healthy adults who were recruited from Argentina, Bolivia, Chile, Cuba, El Salvador, Guatemala, Honduras, Mexico, Paraguay, Peru, and Puerto Rico. Each subject was administered the SDMT as part of a larger neuropsychological battery. A standardized five-step statistical procedure was used to generate the norms.

RESULTS: The final multiple linear regression models explained 29–56% of the variance in SDMT scores. Although there were gender differences on the SDMT in Mexico, Honduras, Paraguay, and Guatemala, none of the four countries had an effect size greater than 0.3. As a result, gender-adjusted norms were not generated.

CONCLUSIONS: This is the first normative multicenter study conducted in Latin America to create norms for the SDMT; this study will have an impact on the future practice of neuropsychology throughout the global region.

Keywords: Normative data, Symbol Digit Modalities Test, reference values, Latin America, processing speed, attention

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1. Introduction

The Symbol Digit Modalities Test (SDMT) is a paper-and-pencil substitution task which is easily administered and sensitive to the presence of cerebral dysfunction (Smith, 1982). Originally published in 1973 and later revised (Smith, 1982), the SDMT is considered a measure of divided attention, complex scanning and visual tracking, perceptual and motor speed, and memory (Shum, McFarland, & Bain, 1990; Lezak, Howieson, & Loring, 2004).

The SDMT consists of a key with two rows, with nine stimulus symbols in the upper row and matched numbers (1–9) in the row below it. The task sequence consists of a series of symbols, each with a blank space underneath, which the subject is asked to consecutively fill with the corresponding numbers as fast as possible in 90 seconds after completing a 10-item practice trial. The score of the test is the number of correct substitutions completed within the time limit, with the maximum score of 110 (Smith, 1982). Obtaining a score under 33 on the SDMT is generally considered a clear indicator of the existence of some type of cognitive disorder (Cherbuin, Sachdev, & Anstey, 2010). The SDMT is very similar to the Digit Symbol Coding subtest of the WAIS (Wechsler, 1981), with which it correlates very highly, suggesting they are essentially the same (Morgan & Wheelock, 1992). However, the SDMT has the advantage of allowing for responses with a more familiar act of number writing, as well as a spoken response trial (Smith, 1982; Lezak et al., 2004). A correlation on the order of 0.80 has been reported between the standard SDMT and its oral version, as well as Wechsler Digit Symbol Coding, confirming its content and construct validity (Smith, 1991; Bowler, Sudia, Mergler, Harrison, & Cone, 1992; Lezak et al., 2004). Test-retest reliability in a sample of young athletes ranged from 0.74 to 0.91, and from 0.84 to 0.93 in healthy adults (Hinton-Bayre, Geffen, & McFarland, 1997; Hinton-Bayre, Geffen, Geffen, McFarland, & Frijs, 1999; Amodio et al., 2002; Benedict, Smerbeck, Parikh, Rodgers, Cadavid, & Erlanger, 2012).

Due to its wide applicability and ease of administration, the SDMT has been used to study cognitive sequelae in a variety of neurological conditions, including the consequences of traumatic head injury in adults (Ponsford & Kinsella, 1992; Hingon-Bayre, Geffen, & McFarland, 1997; Felmingham, Baguley, & Green, 2004), brain damage in children (Lewandowski, 1984), aging and dementia (Pfeffer et al., 1981), hepatic encephalopathy (Tarter, Hegedus, Van Thiel, Schade,

Gavaler, & Starzl., 1984; Quero, Hartmann, Meulstee, Hop, & Schalm, 1996), extra-pyramidal disorders (Starkstein et al., 1988; Starkstein, Bolduc, Preziosi, & Robinson, 1989), multiple sclerosis (Benedict et al., 2002; Huijbregts, Kalkers, de Sonnevill, de Groot, Reuling, & Polman, 2004; Nocentini et al., 2006), and schizophrenia (Dickinson, Ramsey, & Gold, 2007).

Performance on the SDMT is affected by age and educational level: scores have been shown to decline with increasing age and lower education levels (Smith, 1982; Strauss, Shermann, & Spreen, 2006), while improved performance was noted with increasing verbal IQ scores (Nielsen, Knudsen, & Daugbjerg, 1989; Waldmann, Dickson, Monahan, & Kazelskis, 1992). Age-related decline in performance likely reflects changes in the speed of both motor response and information processing (Gilmore, Royer, & Gruhn, 1983) and in memory (Joy, Kaplan, & Fein, 2004). Some studies have also found gender effects (with women outperforming men), although this finding is not consistent, tends to diminish when controlling for handedness (Waldmann, Dickson, Monahan, & Kazelskis, 1992; Lezak et al., 2004; Strauss et al., 2006), and appears to be of insufficient magnitude to create separate gender-based norms (Gilmore, Royer, & Gruhn, 1983).

The SDMT normative data, while accounting for such factors as age and level of education, are lacking for adults from diverse racial/ethnic groups as well as diverse global regions (Sheridan et al., 2006). This is an important issue, considering the well-documented effect of culture on differences in performance in nearly all domains of neuropsychological functioning (O'Bryant, Humphreys, Bauer, McCaffrey, & Hilsabeck, 2007). In recent years, a number of normative studies have taken place, including among African Americans, Blacks of Caribbean ancestry, and non-Latino Whites living in areas of the United States with large populations of Blacks (Gonzalez, Whitfield, West, Williams, Lichtenberg, & Jackson, 2007), Italian adults (Amodio et al., 2002; Nocentini, Giordano, Di Vincenzo, Panella, & Pasqualetti, 2006), healthy elderly Danes (Vogel, Stokholm, & Jorgensen, 2013), and in Spain among healthy adults (Smith, 2002) and institutionalized elderly persons (Cancela, Ayan, & Varela, 2012).

Normative data are needed to implement the SDMT correctly in Latin America. To date, only limited normative data have been produced on the SDMT in Spanish from Spain but none from Latin America. The unique educational opportunities and cultures in this region underscore the necessity of norms standard-

ized for Latin America, as interpreting performance on the SDMT in individuals from this region using norms from other countries and languages might result in significant assessment errors. As a result, the purpose of the current study was to generate norms for the SDMT across 11 countries in Latin America with appropriate adjustments for age, gender, and formal education.

2. Method

2.1. Participants

The sample consisted of 3,977 healthy individuals who were recruited from Argentina, Bolivia, Chile, Cuba, El Salvador, Guatemala, Honduras, Mexico, Paraguay, Peru, and Puerto Rico. The participants were selected according to the following criteria: a) were between 18 to 95 years of age, b) were born and currently lived in the country where the protocol was conducted, c) spoke Spanish as their native language, d) had completed at least one year of formal education, e) were able to read and write at the time of evaluation, f) scored ≥ 23 on the Mini-Mental State Examination (MMSE, Folstein, Folstein, & McHugh, 1975), g) scored ≤ 4 on the Patient Health Questionnaire-9 (PHQ-9, Kroenke, Spitzer, & Williams, 2001), and h) scored ≥ 90 on the Barthel Index (Mahoney & Barthel, 1965).

Participants with self-reported neurologic or psychiatric disorders were excluded due to a potential effect on cognitive performance. Participants were volunteers from the community and signed an informed consent form. Twelve participants were excluded from the analyses, with a final sample of 3965 participants. Socio-demographic and participant characteristics for each of the countries' samples have been reported elsewhere (Guàrdia-Olmos, Peró-Cebollero, Rivera, & Arango-Lasprilla, 2015). The multi-center study was approved by the Ethics Committee of the coordinating site, the University of Deusto, Spain.

2.2. Instrument administration

The SDMT test consists of converting symbols with shaped geometric figures in numbers. This substitution can be applied orally or in writing. This study used normative data for the written form. When administering the test, confirmation that the subject is marking the answers in the order given and without skipping

any lines is necessary. The subject's score is the number of correct substitutions made at an interval of 90 seconds.

2.3. Statistical analyses

The detailed statistical analyses used to generate the normative data for this test are described in Guàrdia-Olmos et al. (2015). In summary, the data manipulation process for each country-specific dataset involved five-steps: a) *t* – tests for independent samples and effect sizes (*r*) were conducted to determine gender effects. If the effect size was larger than 0.3, gender was included in the model with gender dummy coded and female as the reference group (male = 1 and female = 0); b) A multivariable regression model was used to specify the predictive model including gender (if effect size was larger than 0.3), age as a continuous variable, and education as a dummy coded variable with 1 if the participant had >12 years of education and 0 if the participants had 1–12 years of education. If gender, age and/or education was not statistically significant in this multivariate model with an alpha of 0.05, the non-significant variables were removed and the model was re-run. Then a final regression model was conducted that included age (if statistically significant in the multivariable model), dichotomized education (if statistically significant in the multivariate model), and/or gender (if effect size was greater than 0.3) [$\hat{y}_i = \beta_0 + (\beta_{Age} \cdot Age_i) + (\beta_{Educ} \cdot Educ_i) + (\beta_{Gender} \cdot Gender_i)$]; c) residual scores were calculated based on this final model ($e_i = y_i - \hat{y}_i$); d) using the SD_e (residual) value provided by the regression model, residuals were standardized: $z = e_i / SD_e$, with SD_e (residual) = the standard deviation of the residuals in the normative sample; and e) standardized residuals were converted to percentile values (Strauss et al., 2006). Using each country's dataset, these steps were applied to SDMT scores.

3. Results

Regarding the effect of gender on SDMT, the *t*-tests showed significant differences between men and women in the countries of Honduras, Mexico, and Paraguay, however, none of these three countries had an effect size larger than 0.3. Table 1 shows the results of the gender analyses by country on SDMT scores. As shown in Table 1, the effect sizes for all countries were

Table 1
Effect of gender in the SDMT

Country	Gender	Mean (SD)	<i>t</i>	df	Sig. (2-tailed)	<i>r</i>
Argentina ^a	Male	43.9 (10.1)	-0.27	219.2	0.791	0.018
	Female	44.2 (12.5)				
Bolivia	Male	27.7 (17.6)	-0.29	272	0.775	0.017
	Female	28.4 (18.7)				
Chile	Male	34.4 (19.0)	-0.95	318	0.341	0.053
	Female	36.5 (19.9)				
Cuba	Male	33.0 (12.4)	-0.19	304	0.853	0.011
	Female	33.3 (13.4)				
El Salvador ^a	Male	26.5 (16.9)	1.39	180.5	0.165	0.103
	Female	23.7 (14.0)				
Guatemala	Male	34.8 (16.2)	-1.59	210	0.113	0.109
	Female	38.3 (16.0)				
Honduras	Male	29.7 (14.7)	3.20	178	0.002**	0.233
	Female	23.0 (12.6)				
Mexico	Male	39.2 (16.2)	2.78	1,295	0.006**	0.077
	Female	36.6 (15.7)				
Paraguay ^a	Male	24.2 (10.4)	2.39	176.1	0.018*	0.177
	Female	21.3 (8.2)				
Peru ^a	Male	41.5 (12.2)	0.23	206.4	0.818	0.016
	Female	41.1 (14.8)				
Puerto Rico	Male	40.4 (16.5)	0.43	290	0.669	0.025
	Female	39.7 (15.1)				

^aValue of the *t*-test for independent groups from the different variances with the corresponding correction of Yuen-Welch of degrees of freedom.
p* < 0.05, *p* < 0.01.

less than 0.3, and therefore gender was not taken into account to generate SDMT normative data for any of the countries in the study.

The final eleven SDMT multivariate linear regression models for each country are shown in Table 2. In all countries, the SDMT score increased for those with more than 12 years of education (see Table 2) and, in all countries SDMT scores decreased in a linear fashion as a function of age. The amount of variance explained in SDMT scores ranged from 30% (in Guatemala) to 56% (in Chile).

3.1. Normative procedure

Norms (e.g., a percentile score) for the SDMT score test were established using the five-step procedure described above. To facilitate the understanding of the procedure to obtain the percentile associated with a score on this test, an example will be given. Suppose you need to find the percentile score for a Mexican woman, who is 25 years old and has 13 years of education. She has a score of 40 on the SDMT test. The steps to obtain the percentile for this score are: a) Check Table 1 to determine if the effect size of gender in the country of interest (Mexico) on this test and time point (SDMT) is greater than 0.3 by country. In this example, the effect size is 0.077, which is not greater than 0.3. For Mexican

on this test, gender does not influence scores to a sufficient degree to take it into account when determining the percentile. b) Find Mexico in Table 2, which provides the final regression models by country for SDMT. Use the B weights to create an equation that will allow you to obtain the predicted SDMT score. The corresponding B weights are multiplied by the actual age and dichotomized education scores and added to a constant in order to calculate the predicted value. In this case, the predicted SDMT score would be calculated using the equation [$\hat{y}_i = 60.802 + (-0.471 \cdot Age_i) + (6.229 \cdot Dichotomized\ Educational\ Level_i)$] (the values have been rounded for presentation in the formula). The subscript notation *i* indicates the person of interest. The person's age is 25, but the education variable is not continuous in the model. Years of education is split into either 1 to 12 years (and assigned a 0) or more than 12 years (and assigned a 1) in the model. Since our hypothetical person in the example has 13 years of education, her educational level value is 1. Thus the predicted value is $\hat{y}_i = 60.802 + (-0.471 \cdot 25) + (6.229 \cdot 1) = 60.802 - 11.778 + 6.229 = 55.25$. c) In order to calculate the residual value (indicated with an *e* in the equation), we subtract the actual value from the predicted value we just calculated ($e_i = y_i - \hat{y}_i$). In this case, it would be $e_i = 40 - 55.25 = -15.25$. d) Next, consult the SD_e column in Table 2 to obtain the country-

Table 2
Final multiple linear regression models for SDMT

Country		B	Std. Error	t	Sig.	R ²	SD _e (residual)
Argentina	(Constant)	51.557	1.516	34.013	<0.001	0.380	9.294
	Age	-0.267	0.027	-9.901	<0.001		
	Education	8.855	1.055	8.395	<0.001		
Bolivia	(Constant)	54.010	2.434	22.193	<0.001	0.405	14.082
	Age	-0.489	0.039	-12.460	<0.001		
	Education	8.180	2.268	3.606	<0.001		
Chile	(Constant)	62.742	2.421	25.917	<0.001	0.557	12.995
	Age	-0.563	0.039	-14.482	<0.001		
	Education	15.798	1.767	8.942	<0.001		
Cuba	(Constant)	49.802	1.726	28.852	<0.001	0.379	10.163
	Age	-0.351	0.030	-11.830	<0.001		
	Education	8.171	1.377	5.933	<0.001		
El Salvador	(Constant)	40.460	2.040	19.836	<0.001	0.483	10.956
	Age	-0.348	0.033	-10.437	<0.001		
	Education	17.849	1.689	10.569	<0.001		
Guatemala	(Constant)	45.901	3.117	14.726	<0.001	0.299	13.544
	Age	-0.282	0.054	-5.188	<0.001		
	Education	15.014	1.924	7.804	<0.001		
Honduras	(Constant)	37.853	2.208	17.147	<0.001	0.486	9.874
	Age	-0.331	0.041	-8.159	<0.001		
	Education	14.479	1.757	8.241	<0.001		
Mexico	(Constant)	60.802	0.972	62.534	<0.001	0.430	12.012
	Age	-0.471	0.016	-28.592	<0.001		
	Education	6.229	0.807	7.719	<0.001		
Paraguay	(Constant)	32.522	1.812	17.950	<0.001	0.441	6.866
	Age	-0.226	0.031	-7.187	<0.001		
	Education	10.241	1.211	8.456	<0.001		
Peru	(Constant)	52.694	1.787	29.491	<0.001	0.534	9.486
	Age	-0.404	0.030	-13.377	<0.001		
	Education	9.400	1.295	7.261	<0.001		
Puerto Rico	(Constant)	64.815	2.255	28.739	<0.001	0.473	11.380
	Age	-0.534	0.037	-14.263	<0.001		
	Education	5.010	1.387	3.611	<0.001		

specific SD_e (residual) value. For Mexico it is 12.012. Using this value, we can transform the residual value to a standardized z score using the equation (e_i/SD_e) . In this case, we have $(-15.25)/12.012 = -1.269$. This is the standardized z score for a Mexican woman aged 25 and 13 years of education and a score of 40 on the SDMT test. e) The last step is to use look-up the tables in the statistical reference books (e.g. Strauss et al., 2006) or use a trusted online calculator like the one available at <http://www.measuringu.com/pcalcz.php>. In the online calculator, you would enter the z score and choose a one-sided test and note the percent of area after hitting the submit button. In this case, the probability of -1.269 corresponds to the 10th percentile.

3.2. User-friendly normative data tables

The five-step normative procedures explained above can provide more individualized norms. However, this method can be prone to human error due to the number

of required computations. To enhance user-friendliness, the authors have completed these steps for a range of raw scores based on small age range groupings (see Guàrdia-Olmos et al., 2015) and created tables so that clinicians can more easily use to obtain a percentile range associated with a given raw score on this test. These tables are available by country and type of test (SDMT) in the Appendix. In order to obtain an approximate percentile for the above example (converting a raw score of 40 for a Mexican women who is 25 years old and has 13 years of education) using the simplified normative tables provided, the following steps are recommended. (1) First, identify the appropriate table ensuring the specific country and test. In this case, the table for SDMT scores for Mexico can be found in Table A8. (2) Note if the title of the table indicates that it is only to be used for one specific gender. In this case, gender is not specified. Thus Table A8 is used for both males and females. (3) Next, the table is divided based on educational level (1 to 12 vs. more than 12 years of

education). Since this woman has 13 years of education, she falls into the more than 12 years of education category. These data can be found in the top section of the table. (4) Determine the age range most appropriate for the individual. In this case, 25 falls into the column 23–27 years of age. (5) Read down the age range column to find the approximate location of the raw score the person obtained on the test. Reading down the 23–27 column, the score of 40 obtained by this Mexican woman corresponds to an approximate percentile of 10.

4. Discussion

The purpose of the current study was to generate normative data on the SDMT across 11 countries in Latin America, with country-specific adjustments for gender, age, and education, where appropriate. The final multiple linear regression models explained between 29–55% of the variance in the SDMT scores. Although men outperformed women on the SDMT in three of the 11 countries (Mexico, Honduras, and Paraguay), women outperformed men in Guatemala. Nonetheless, all gender effect sizes were small, and therefore gender-adjusted norms were not generated. These findings are generally in line with the literature, as previously reported gender effects have tended to be inconsistent and to diminish when controlling for handedness (Waldmann et al., 1992; Lezak et al., 2004; Strauss et al., 2006). Previous studies have similarly found gender differences to be too small to create separate gender norms (Gilmore, Royer, & Gruhn, 1983). In light of the previous literature, the current results suggest that gender should not be taken into account in calculating participants' percentiles for the SDMT in Latin America when using the current norms.

The SDMT scores increased linearly as a function of education in all countries. These findings were consistent within the current study, as well as with previous studies showing that performance on the SDMT increases with education level (Smith, 1982; Strauss et al., 2006). Because of potentially major differences in the quality of education across countries in Latin America, it is very important to use the education-adjusted norms generated for a single country when administering the SDMT to individuals from that country.

Age was inversely associated with SDMT scores in all countries, and as a result, age-adjusted norms were calculated for each country. These findings are in line with the previous literature showing SDMT scores to decrease with advancing age (Smith, 1982; Strauss,

Shermann, & Spreen, 2006), as age-related decline in SDMT performance likely reflects changes in the speed of motor response and information processing (Gilmore et al., 1983) and in memory (Joy, Kaplan, & Fein, 2004). As with education, it is important that neuropsychologists in Latin America use the age-adjusted norms for their specific country.

4.1. Limitations and future directions

This study has several limitations, and as a result directions for future research. First, this study was subject to a number of sampling limitations. Participants had Spanish as their primary language, and SDMT performance could differ among people with various languages, bilingualism, or local dialects such as Quechua or Guaraní. A ripe area for future research is bilingualism and SDMT performance. Also, the data were collected in various regions of the countries in this study, as opposed to nationally. Although this study was the largest neuropsychological normative study in the history of Latin America, or of any global region, it is only a first step in conducting more rigorous, larger studies with nationally representative samples. Although many participants had fewer than 12 years of education, those who were unable to read or write were excluded; thus, the SDMT norms cannot generalize to illiterate populations. Similarly, all participants in the current study were healthy adults, so future studies need to include populations with neurological conditions, as well as children. Future research may also assess participants' bilingualism, which was not controlled for or examined.

Second, clinicians should be cautious about using the norms of the SDMT from the current study in countries in Latin America beyond the 11 countries from which data were collected. In the future, it is important to establish SDMT norms in other countries such as Ecuador, Uruguay, Venezuela, and Panama. Nonetheless, the current SDMT norms may be more accurate in these countries than other norms from Spain or English-speaking countries that may currently be in use; future research should nonetheless investigate the generalizability of the current norms.

Third, despite the SDMT's commonness in Latin America, many other assessments are also common and need to be normed in the same manner. It is important that future research examine the psychometric properties of common neuropsychological instruments in Latin America, even at the individual item level. Research should also examine whether

neuropsychological assessments have good ecological validity, or develop instruments in those cultures with higher ecological validity. The SDMT was created in a Western culture that may be different from the various cultures in Latin America. Future research should develop more culturally sensitive assessments bound in local cultures, not solely translate and norm tests from other cultures and countries.

Despite these limitations and although previous studies have produced Spanish-language norms for the SDMT in Spain with healthy adults (Smith, 2002), the current study was the first to generate SDMT norms across 11 countries in Latin America with nearly 4,000 participants. This study was the largest and most comprehensive SDMT normative study to date in any global region, and its norms have the potential to affect the standard of neuropsychological assessment with the SDMT in Latin America unlike any study before it.

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Appendix

Table A1
Normative data for the SDMT stratified by age and education levels for ARGENTINA

		Age (Years)												
Percentile		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
>12 years of education	95	70.3	69.0	67.6	66.3	65.0	63.6	62.3	61.0	59.6	58.3	57.0	55.6	54.3
	90	67.0	65.6	64.3	63.0	61.6	60.3	59.0	57.6	56.3	54.9	53.6	52.3	50.9
	85	64.7	63.4	62.1	60.7	59.4	58.1	56.7	55.4	54.0	52.7	51.4	50.0	48.7
	80	62.9	61.5	60.2	58.9	57.5	56.2	54.9	53.5	52.2	50.9	49.5	48.2	46.8
	70	59.9	58.6	57.2	55.9	54.6	53.2	51.9	50.6	49.2	47.9	46.5	45.2	43.9
	60	57.4	56.1	54.7	53.4	52.1	50.7	49.4	48.0	46.7	45.4	44.0	42.7	41.4
	50	55.1	53.7	52.4	51.1	49.7	48.4	47.1	45.7	44.4	43.0	41.7	40.4	39.0
	40	52.7	51.4	50.1	48.7	47.4	46.1	44.7	43.4	42.1	40.7	39.4	38.1	36.7
	30	50.2	48.9	47.6	46.2	44.9	43.6	42.2	40.9	39.6	38.2	36.9	35.5	34.2
	20	47.3	45.9	44.6	43.3	41.9	40.6	39.2	37.9	36.6	35.2	33.9	32.6	31.2
	15	45.4	44.1	42.7	41.4	40.1	38.7	37.4	36.1	34.7	33.4	32.0	30.7	29.4
	10	43.2	41.8	40.5	39.2	37.8	36.5	35.2	33.8	32.5	31.2	29.8	28.5	27.1
	5	39.8	38.5	37.2	35.8	34.5	33.1	31.8	30.5	29.1	27.8	26.5	25.1	23.8
1 to 12 years of education	95	61.5	60.1	58.8	57.4	56.1	54.8	53.4	52.1	50.8	49.4	48.1	46.8	45.4
	90	58.1	56.8	55.4	54.1	52.8	51.4	50.1	48.8	47.4	46.1	44.8	43.4	42.1
	85	55.9	54.5	53.2	51.9	50.5	49.2	47.9	46.5	45.2	43.9	42.5	41.2	39.9
	80	54.0	52.7	51.3	50.0	48.7	47.3	46.0	44.7	43.3	42.0	40.7	39.3	38.0
	70	51.0	49.7	48.4	47.0	45.7	44.4	43.0	41.7	40.4	39.0	37.7	36.4	35.0
	60	48.5	47.2	45.9	44.5	43.2	41.9	40.5	39.2	37.9	36.5	35.2	33.8	32.5
	50	46.2	44.9	43.5	42.2	40.9	39.5	38.2	36.9	35.5	34.2	32.9	31.5	30.2
	40	43.9	42.6	41.2	39.9	38.5	37.2	35.9	34.5	33.2	31.9	30.5	29.2	27.9
	30	41.4	40.0	38.7	37.4	36.0	34.7	33.4	32.0	30.7	29.4	28.0	26.7	25.4
	20	38.4	37.1	35.7	34.4	33.1	31.7	30.4	29.1	27.7	26.4	25.1	23.7	22.4
	15	36.5	35.2	33.9	32.5	31.2	29.9	28.5	27.2	25.9	24.5	23.2	21.9	20.5
	10	34.3	33.0	31.6	30.3	29.0	27.6	26.3	25.0	23.6	22.3	21.0	19.6	18.3
	5	31.0	29.6	28.3	27.0	25.6	24.3	23.0	21.6	20.3	19.0	17.6	16.3	14.9

Table A2
Normative data for the SDMT stratified by age and education levels for BOLIVIA

		Age (Years)												
Percentile		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
>12 years of education	95	75.5	73.1	70.6	68.2	65.7	63.3	60.8	58.4	55.9	53.5	51.1	48.6	46.2
	90	70.4	68.0	65.5	63.1	60.7	58.2	55.8	53.3	50.9	48.4	46.0	43.5	41.1
	85	67.1	64.6	62.2	59.7	57.3	54.8	52.4	49.9	47.5	45.0	42.6	40.2	37.7
	80	64.2	61.8	59.3	56.9	54.5	52.0	49.6	47.1	44.7	42.2	39.8	37.3	34.9
	70	59.7	57.3	54.8	52.4	50.0	47.5	45.1	42.6	40.2	37.7	35.3	32.8	30.4
	60	55.9	53.5	51.0	48.6	46.1	43.7	41.3	38.8	36.4	33.9	31.5	29.0	26.6
	50	52.4	50.0	47.5	45.1	42.6	40.2	37.7	35.3	32.8	30.4	28.0	25.5	23.1
	40	48.9	46.4	44.0	41.6	39.1	36.7	34.2	31.8	29.3	26.9	24.4	22.0	19.5
	30	45.1	42.6	40.2	37.8	35.3	32.9	30.4	28.0	25.5	23.1	20.6	18.2	15.7
	20	40.6	38.1	35.7	33.2	30.8	28.4	25.9	23.5	21.0	18.6	16.1	13.7	11.2
	15	37.8	35.3	32.9	30.4	28.0	25.5	23.1	20.6	18.2	15.8	13.3	10.9	8.4
	10	34.4	31.9	29.5	27.0	24.6	22.2	19.7	17.3	14.8	12.4	9.9	7.5	5.0
	5	29.3	26.9	24.4	22.0	19.5	17.1	14.6	12.2	9.8	7.3	4.9	2.4	0.0
1 to 12 years of education	95	67.3	64.9	62.4	60.0	57.5	55.1	52.7	50.2	47.8	45.3	42.9	40.4	38.0
	90	62.3	59.8	57.4	54.9	52.5	50.0	47.6	45.1	42.7	40.2	37.8	35.4	32.9
	85	58.9	56.4	54.0	51.5	49.1	46.6	44.2	41.8	39.3	36.9	34.4	32.0	29.5
	80	56.1	53.6	51.2	48.7	46.3	43.8	41.4	38.9	36.5	34.1	31.6	29.2	26.7
	70	51.6	49.1	46.7	44.2	41.8	39.3	36.9	34.4	32.0	29.5	27.1	24.7	22.2
	60	47.7	45.3	42.9	40.4	38.0	35.5	33.1	30.6	28.2	25.7	23.3	20.9	18.4
	50	44.2	41.8	39.3	36.9	34.4	32.0	29.6	27.1	24.7	22.2	19.8	17.3	14.9
	40	40.7	38.3	35.8	33.4	30.9	28.5	26.0	23.6	21.1	18.7	16.3	13.8	11.4
	30	36.9	34.5	32.0	29.6	27.1	24.7	22.2	19.8	17.3	14.9	12.5	10.0	7.6
	20	32.4	30.0	27.5	25.1	22.6	20.2	17.7	15.3	12.8	10.4	7.9	5.5	3.1
	15	29.6	27.1	24.7	22.2	19.8	17.4	14.9	12.5	10.0	7.6	5.1	2.7	0.2
	10	26.2	23.8	21.3	18.9	16.4	14.0	11.5	9.1	6.6	4.2	1.8	–	–
	5	21.1	18.7	16.2	13.8	11.4	8.9	6.5	4.0	1.6	–	–	–	–

Table A3
Normative data for the SDMT stratified by age and education levels for CHILE

	Percentile	Age (Years)												
		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
>12 years of education	95	88.6	85.8	83.0	80.1	77.3	74.5	71.7	68.9	66.1	63.2	60.4	57.6	54.8
	90	83.9	81.1	78.3	75.5	72.6	69.8	67.0	64.2	61.4	58.6	55.8	52.9	50.1
	85	80.8	78.0	75.2	72.3	69.5	66.7	63.9	61.1	58.3	55.5	52.6	49.8	47.0
	80	78.2	75.4	72.6	69.7	66.9	64.1	61.3	58.5	55.7	52.9	50.0	47.2	44.4
	70	74.0	71.2	68.4	65.6	62.8	60.0	57.1	54.3	51.5	48.7	45.9	43.1	40.2
	60	70.5	67.7	64.9	62.1	59.3	56.4	53.6	50.8	48.0	45.2	42.4	39.6	36.7
	50	67.3	64.5	61.6	58.8	56.0	53.2	50.4	47.6	44.8	41.9	39.1	36.3	33.5
	40	64.0	61.2	58.4	55.6	52.8	50.0	47.1	44.3	41.5	38.7	35.9	33.1	30.2
	30	60.5	57.7	54.9	52.1	49.3	46.4	43.6	40.8	38.0	35.2	32.4	29.5	26.7
	20	56.4	53.5	50.7	47.9	45.1	42.3	39.5	36.7	33.8	31.0	28.2	25.4	22.6
	15	53.8	50.9	48.1	45.3	42.5	39.7	36.9	34.1	31.2	28.4	25.6	22.8	20.0
10	50.6	47.8	45.0	42.2	39.4	36.6	33.7	30.9	28.1	25.3	22.5	19.7	16.9	
5	46.0	43.1	40.3	37.5	34.7	31.9	29.1	26.3	23.4	20.6	17.8	15.0	12.2	
1 to 12 years of education	95	72.8	70.0	67.2	64.3	61.5	58.7	55.9	53.1	50.3	47.5	44.6	41.8	39.0
	90	68.1	65.3	62.5	59.7	56.9	54.0	51.2	48.4	45.6	42.8	40.0	37.1	34.3
	85	65.0	62.2	59.4	56.5	53.7	50.9	48.1	45.3	42.5	39.7	36.8	34.0	31.2
	80	62.4	59.6	56.8	53.9	51.1	48.3	45.5	42.7	39.9	37.1	34.2	31.4	28.6
	70	58.2	55.4	52.6	49.8	47.0	44.2	41.3	38.5	35.7	32.9	30.1	27.3	24.4
	60	54.7	51.9	49.1	46.3	43.5	40.7	37.8	35.0	32.2	29.4	26.6	23.8	20.9
	50	51.5	48.7	45.8	43.0	40.2	37.4	34.6	31.8	29.0	26.1	23.3	20.5	17.7
	40	48.2	45.4	42.6	39.8	37.0	34.2	31.3	28.5	25.7	22.9	20.1	17.3	14.4
	30	44.7	41.9	39.1	36.3	33.5	30.6	27.8	25.0	22.2	19.4	16.6	13.8	10.9
	20	40.6	37.7	34.9	32.1	29.3	26.5	23.7	20.9	18.0	15.2	12.4	9.6	6.8
	15	38.0	35.1	32.3	29.5	26.7	23.9	21.1	18.3	15.4	12.6	9.8	7.0	4.2
10	34.8	32.0	29.2	26.4	23.6	20.8	18.0	15.1	12.3	9.5	6.7	3.9	1.1	
5	30.2	27.4	24.5	21.7	18.9	16.1	13.3	10.5	7.6	4.8	2.0	–	–	

Table A4
Normative data for the SDMT stratified by age and education levels for CUBA

	Percentile	Age (Years)												
		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
>12 years of education	95	67.6	65.9	64.1	62.4	60.6	58.9	57.1	55.4	53.6	51.8	50.1	48.3	46.6
	90	64.0	62.2	60.5	58.7	57.0	55.2	53.4	51.7	49.9	48.2	46.4	44.7	42.9
	85	61.5	59.8	58.0	56.3	54.5	52.8	51.0	49.3	47.5	45.7	44.0	42.2	40.5
	80	59.5	57.7	56.0	54.2	52.5	50.7	49.0	47.2	45.5	43.7	42.0	40.2	38.5
	70	56.2	54.5	52.7	51.0	49.2	47.5	45.7	44.0	42.2	40.5	38.7	37.0	35.2
	60	53.5	51.7	50.0	48.2	46.5	44.7	43.0	41.2	39.5	37.7	36.0	34.2	32.5
	50	51.0	49.2	47.5	45.7	43.9	42.2	40.4	38.7	36.9	35.2	33.4	31.7	29.9
	40	48.4	46.7	44.9	43.2	41.4	39.7	37.9	36.1	34.4	32.6	30.9	29.1	27.4
	30	45.7	43.9	42.2	40.4	38.7	36.9	35.2	33.4	31.6	29.9	28.1	26.4	24.6
	20	42.4	40.7	38.9	37.2	35.4	33.7	31.9	30.1	28.4	26.6	24.9	23.1	21.4
	15	40.4	38.6	36.9	35.1	33.4	31.6	29.9	28.1	26.4	24.6	22.9	21.1	19.3
10	38.0	36.2	34.4	32.7	30.9	29.2	27.4	25.7	23.9	22.2	20.4	18.7	16.9	
5	34.3	32.5	30.8	29.0	27.3	25.5	23.8	22.0	20.3	18.5	16.8	15.0	13.2	
1 to 12 years of education	95	59.5	57.7	55.9	54.2	52.4	50.7	48.9	47.2	45.4	43.7	41.9	40.2	38.4
	90	55.8	54.0	52.3	50.5	48.8	47.0	45.3	43.5	41.8	40.0	38.3	36.5	34.8
	85	53.4	51.6	49.8	48.1	46.3	44.6	42.8	41.1	39.3	37.6	35.8	34.1	32.3
	80	51.3	49.6	47.8	46.1	44.3	42.6	40.8	39.0	37.3	35.5	33.8	32.0	30.3
	70	48.1	46.3	44.6	42.8	41.1	39.3	37.6	35.8	34.0	32.3	30.5	28.8	27.0
	60	45.3	43.6	41.8	40.1	38.3	36.6	34.8	33.1	31.3	29.5	27.8	26.0	24.3
	50	42.8	41.0	39.3	37.5	35.8	34.0	32.3	30.5	28.8	27.0	25.3	23.5	21.7
	40	40.2	38.5	36.7	35.0	33.2	31.5	29.7	28.0	26.2	24.5	22.7	21.0	19.2
	30	37.5	35.7	34.0	32.2	30.5	28.7	27.0	25.2	23.5	21.7	20.0	18.2	16.5
	20	34.3	32.5	30.7	29.0	27.2	25.5	23.7	22.0	20.2	18.5	16.7	15.0	13.2
	15	32.2	30.5	28.7	27.0	25.2	23.5	21.7	19.9	18.2	16.4	14.7	12.9	11.2
10	29.8	28.0	26.3	24.5	22.8	21.0	19.3	17.5	15.8	14.0	12.2	10.5	8.7	
5	26.1	24.4	22.6	20.9	19.1	17.4	15.6	13.8	12.1	10.3	8.6	6.8	5.1	

Table A5
Normative data for the SDMT stratified by age and education levels for EL SALVADOR

		Age (Years)												
Percentile		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
> 12 years of education	95	69.3	67.6	65.8	64.1	62.4	60.6	58.9	57.2	55.4	53.7	51.9	50.2	48.5
	90	65.4	63.6	61.9	60.2	58.4	56.7	55.0	53.2	51.5	49.7	48.0	46.3	44.5
	85	62.8	61.0	59.3	57.5	55.8	54.1	52.3	50.6	48.8	47.1	45.4	43.6	41.9
	80	60.6	58.8	57.1	55.3	53.6	51.9	50.1	48.4	46.7	44.9	43.2	41.4	39.7
	70	57.1	55.3	53.6	51.8	50.1	48.4	46.6	44.9	43.2	41.4	39.7	37.9	36.2
	60	54.1	52.4	50.6	48.9	47.1	45.4	43.7	41.9	40.2	38.5	36.7	35.0	33.2
	50	51.4	49.6	47.9	46.1	44.4	42.7	40.9	39.2	37.5	35.7	34.0	32.2	30.5
	40	48.6	46.9	45.1	43.4	41.7	39.9	38.2	36.5	34.7	33.0	31.2	29.5	27.8
	30	45.7	43.9	42.2	40.4	38.7	37.0	35.2	33.5	31.8	30.0	28.3	26.5	24.8
	20	42.2	40.4	38.7	36.9	35.2	33.5	31.7	30.0	28.3	26.5	24.8	23.0	21.3
	15	40.0	38.2	36.5	34.7	33.0	31.3	29.5	27.8	26.1	24.3	22.6	20.8	19.1
	10	37.3	35.6	33.9	32.1	30.4	28.6	26.9	25.2	23.4	21.7	20.0	18.2	16.5
	5	33.4	31.7	29.9	28.2	26.4	24.7	23.0	21.2	19.5	17.7	16.0	14.3	12.5
1 to 12 years of education	95	51.5	49.7	48.0	46.3	44.5	42.8	41.0	39.3	37.6	35.8	34.1	32.4	30.6
	90	47.5	45.8	44.1	42.3	40.6	38.8	37.1	35.4	33.6	31.9	30.2	28.4	26.7
	85	44.9	43.2	41.4	39.7	38.0	36.2	34.5	32.7	31.0	29.3	27.5	25.8	24.0
	80	42.7	41.0	39.2	37.5	35.8	34.0	32.3	30.5	28.8	27.1	25.3	23.6	21.9
	70	39.2	37.5	35.7	34.0	32.3	30.5	28.8	27.0	25.3	23.6	21.8	20.1	18.3
	60	36.2	34.5	32.8	31.0	29.3	27.6	25.8	24.1	22.3	20.6	18.9	17.1	15.4
	50	33.5	31.8	30.0	28.3	26.6	24.8	23.1	21.3	19.6	17.9	16.1	14.4	12.7
	40	30.8	29.0	27.3	25.6	23.8	22.1	20.3	18.6	16.9	15.1	13.4	11.7	9.9
	30	27.8	26.1	24.3	22.6	20.9	19.1	17.4	15.6	13.9	12.2	10.4	8.7	7.0
	20	24.3	22.6	20.8	19.1	17.4	15.6	13.9	12.1	10.4	8.7	6.9	5.2	3.4
	15	22.1	20.4	18.6	16.9	15.2	13.4	11.7	9.9	8.2	6.5	4.7	3.0	1.3
	10	19.5	17.7	16.0	14.3	12.5	10.8	9.1	7.3	5.6	3.8	2.1	0.4	–
	5	15.5	13.8	12.1	10.3	8.6	6.9	5.1	3.4	1.6	–	–	–	–

Table A6
Normative data for the SDMT stratified by education levels for GUATEMALA

		Age (Years)												
Percentile		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
> 12 years of education	95	77.5	76.1	74.7	73.3	71.9	70.5	69.0	67.6	66.2	64.8	63.4	62.0	60.6
	90	72.6	71.2	69.8	68.4	67.0	65.6	64.2	62.8	61.4	59.9	58.5	57.1	55.7
	85	69.4	68.0	66.6	65.1	63.7	62.3	60.9	59.5	58.1	56.7	55.3	53.9	52.5
	80	66.7	65.3	63.8	62.4	61.0	59.6	58.2	56.8	55.4	54.0	52.6	51.2	49.8
	70	62.3	60.9	59.5	58.1	56.7	55.3	53.9	52.5	51.1	49.7	48.2	46.8	45.4
	60	58.7	57.3	55.9	54.4	53.0	51.6	50.2	48.8	47.4	46.0	44.6	43.2	41.8
	50	55.3	53.9	52.5	51.1	49.7	48.2	46.8	45.4	44.0	42.6	41.2	39.8	38.4
	40	51.9	50.5	49.1	47.7	46.3	44.9	43.4	42.0	40.6	39.2	37.8	36.4	35.0
	30	48.2	46.8	45.4	44.0	42.6	41.2	39.8	38.4	37.0	35.6	34.2	32.8	31.3
	20	43.9	42.5	41.1	39.7	38.3	36.9	35.5	34.0	32.6	31.2	29.8	28.4	27.0
	15	41.2	39.8	38.4	37.0	35.6	34.2	32.7	31.3	29.9	28.5	27.1	25.7	24.3
	10	37.9	36.5	35.1	33.7	32.3	30.9	29.5	28.1	26.7	25.3	23.9	22.5	21.0
	5	33.1	31.7	30.3	28.8	27.4	26.0	24.6	23.2	21.8	20.4	19.0	17.6	16.2
1 to 12 years of education	95	62.5	61.1	59.7	58.3	56.8	55.4	54.0	52.6	51.2	49.8	48.4	47.0	45.6
	90	57.6	56.2	54.8	53.4	52.0	50.6	49.2	47.7	46.3	44.9	43.5	42.1	40.7
	85	54.4	52.9	51.5	50.1	48.7	47.3	45.9	44.5	43.1	41.7	40.3	38.9	37.5
	80	51.6	50.2	48.8	47.4	46.0	44.6	43.2	41.8	40.4	39.0	37.6	36.2	34.7
	70	47.3	45.9	44.5	43.1	41.7	40.3	38.9	37.5	36.0	34.6	33.2	31.8	30.4
	60	43.7	42.2	40.8	39.4	38.0	36.6	35.2	33.8	32.4	31.0	29.6	28.2	26.8
	50	40.3	38.9	37.5	36.0	34.6	33.2	31.8	30.4	29.0	27.6	26.2	24.8	23.4
	40	36.9	35.5	34.1	32.7	31.3	29.8	28.4	27.0	25.6	24.2	22.8	21.4	20.0
	30	33.2	31.8	30.4	29.0	27.6	26.2	24.8	23.4	22.0	20.6	19.1	17.7	16.3
	20	28.9	27.5	26.1	24.7	23.3	21.9	20.4	19.0	17.6	16.2	14.8	13.4	12.0
	15	26.2	24.8	23.4	22.0	20.6	19.1	17.7	16.3	14.9	13.5	12.1	10.7	9.3
	10	22.9	21.5	20.1	18.7	17.3	15.9	14.5	13.1	11.7	10.3	8.9	7.4	6.0
	5	18.1	16.6	15.2	13.8	12.4	11.0	9.6	8.2	6.8	5.4	4.0	2.6	1.2

Table A7
Normative data for the SDMT stratified by age and education levels for HONDURAS

		Age (Years)												
Percentile		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
>12 years of education	95	61.9	60.2	58.6	56.9	55.3	53.6	52.0	50.3	48.6	47.0	45.3	43.7	42.0
	90	58.3	56.7	55.0	53.4	51.7	50.1	48.4	46.7	45.1	43.4	41.8	40.1	38.5
	85	56.0	54.3	52.7	51.0	49.3	47.7	46.0	44.4	42.7	41.1	39.4	37.7	36.1
	80	54.0	52.3	50.7	49.0	47.4	45.7	44.1	42.4	40.7	39.1	37.4	35.8	34.1
	70	50.8	49.2	47.5	45.9	44.2	42.6	40.9	39.2	37.6	35.9	34.3	32.6	30.9
	60	48.2	46.5	44.9	43.2	41.5	39.9	38.2	36.6	34.9	33.3	31.6	29.9	28.3
	50	45.7	44.0	42.4	40.7	39.1	37.4	35.8	34.1	32.4	30.8	29.1	27.5	25.8
	40	43.2	41.6	39.9	38.3	36.6	34.9	33.3	31.6	30.0	28.3	26.7	25.0	23.3
	30	40.6	38.9	37.3	35.6	33.9	32.3	30.6	29.0	27.3	25.7	24.0	22.3	20.7
	20	37.4	35.8	34.1	32.4	30.8	29.1	27.5	25.8	24.1	22.5	20.8	19.2	17.5
	15	35.4	33.8	32.1	30.5	28.8	27.1	25.5	23.8	22.2	20.5	18.9	17.2	15.5
	10	33.1	31.4	29.7	28.1	26.4	24.8	23.1	21.5	19.8	18.1	16.5	14.8	13.2
5	29.5	27.9	26.2	24.5	22.9	21.2	19.6	17.9	16.2	14.6	12.9	11.3	9.6	
1 to 12 years of education	95	47.4	45.8	44.1	42.4	40.8	39.1	37.5	35.8	34.2	32.5	30.8	29.2	27.5
	90	43.9	42.2	40.5	38.9	37.2	35.6	33.9	32.3	30.6	28.9	27.3	25.6	24.0
	85	41.5	39.8	38.2	36.5	34.9	33.2	31.5	29.9	28.2	26.6	24.9	23.3	21.6
	80	39.5	37.9	36.2	34.5	32.9	31.2	29.6	27.9	26.3	24.6	22.9	21.3	19.6
	70	36.4	34.7	33.0	31.4	29.7	28.1	26.4	24.8	23.1	21.4	19.8	18.1	16.5
	60	33.7	32.0	30.4	28.7	27.1	25.4	23.7	22.1	20.4	18.8	17.1	15.5	13.8
	50	31.2	29.6	27.9	26.3	24.6	22.9	21.3	19.6	18.0	16.3	14.6	13.0	11.3
	40	28.8	27.1	25.4	23.8	22.1	20.5	18.8	17.2	15.5	13.8	12.2	10.5	8.9
	30	26.1	24.4	22.8	21.1	19.5	17.8	16.1	14.5	12.8	11.2	9.5	7.9	6.2
	20	22.9	21.3	19.6	18.0	16.3	14.6	13.0	11.3	9.7	8.0	6.4	4.7	3.0
	15	21.0	19.3	17.6	16.0	14.3	12.7	11.0	9.4	7.7	6.0	4.4	2.7	1.1
	10	18.6	16.9	15.3	13.6	12.0	10.3	8.6	7.0	5.3	3.7	2.0	0.4	–
5	15.0	13.4	11.7	10.1	8.4	6.7	5.1	3.4	1.8	0.1	–	–	–	

Table A8
Normative data for the SDMT stratified by age and education levels for MEXICO

		Age (Years)												
Percentile		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
>12 years of education	95	77.3	75.0	72.6	70.2	67.9	65.5	63.2	60.8	58.5	56.1	53.8	51.4	49.0
	90	73.0	70.6	68.3	65.9	63.6	61.2	58.9	56.5	54.1	51.8	49.4	47.1	44.7
	85	70.1	67.7	65.4	63.0	60.7	58.3	56.0	53.6	51.3	48.9	46.5	44.2	41.8
	80	67.7	65.3	63.0	60.6	58.3	55.9	53.6	51.2	48.9	46.5	44.1	41.8	39.4
	70	63.9	61.5	59.1	56.8	54.4	52.1	49.7	47.4	45.0	42.7	40.3	37.9	35.6
	60	60.6	58.3	55.9	53.5	51.2	48.8	46.5	44.1	41.8	39.4	37.1	34.7	32.3
	50	57.6	55.3	52.9	50.5	48.2	45.8	43.5	41.1	38.8	36.4	34.1	31.7	29.3
	40	54.6	52.3	49.9	47.5	45.2	42.8	40.5	38.1	35.8	33.4	31.0	28.7	26.3
	30	51.4	49.0	46.7	44.3	41.9	39.6	37.2	34.9	32.5	30.2	27.8	25.5	23.1
	20	47.5	45.2	42.8	40.5	38.1	35.7	33.4	31.0	28.7	26.3	24.0	21.6	19.3
	15	45.1	42.8	40.4	38.0	35.7	33.3	31.0	28.6	26.3	23.9	21.6	19.2	16.8
	10	42.2	39.9	37.5	35.2	32.8	30.5	28.1	25.7	23.4	21.0	18.7	16.3	14.0
5	37.9	35.6	33.2	30.8	28.5	26.1	23.8	21.4	19.1	16.7	14.4	12.0	9.6	
1 to 12 years of education	95	71.1	68.7	66.3	64.0	61.7	59.3	56.9	54.6	52.2	49.9	47.5	45.1	42.8
	90	66.8	64.4	62.0	59.7	57.3	55.0	52.6	50.3	47.9	45.6	43.2	40.8	38.5
	85	63.9	61.5	59.2	56.8	54.4	52.1	49.7	47.4	45.0	42.7	40.3	38.0	35.6
	80	61.5	59.1	56.8	54.4	52.0	49.7	47.3	45.0	42.6	40.3	37.9	35.6	33.2
	70	57.6	55.3	52.9	50.6	48.2	45.8	43.5	41.1	38.8	36.4	34.1	31.7	29.4
	60	54.4	52.0	49.7	47.3	45.0	42.6	40.2	37.9	35.5	33.2	30.8	28.5	26.1
	50	51.4	49.0	46.7	44.3	42.0	39.6	37.2	34.9	32.5	30.2	27.8	25.5	23.1
	40	48.4	46.0	43.7	41.3	39.0	36.6	34.2	31.9	29.5	27.2	24.8	22.5	20.1
	30	45.1	42.8	40.4	38.1	35.7	33.4	31.0	28.6	26.3	23.9	21.6	19.2	16.9
	20	41.3	38.9	36.6	34.2	31.9	29.5	27.2	24.8	22.4	20.1	17.7	15.4	13.0
	15	38.9	36.5	34.2	31.8	29.5	27.1	24.8	22.4	20.0	17.7	15.3	13.0	10.6
	10	36.0	33.6	31.3	28.9	26.6	24.2	21.9	19.5	17.2	14.8	12.4	10.1	7.7
5	31.7	29.3	27.0	24.6	22.3	19.9	17.5	15.2	12.8	10.5	8.1	5.8	3.4	

Table A9
Normative data for the SDMT stratified by age and education levels for PARAGUAY

		Age (Years)												
Percentile		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
> 12 years of education	95	49.5	48.4	47.3	46.1	45.0	43.9	42.7	41.6	40.5	39.4	38.2	37.1	36.0
	90	47.0	45.9	44.8	43.7	42.5	41.4	40.3	39.1	38.0	36.9	35.8	34.6	33.5
	85	45.4	44.3	43.1	42.0	40.9	39.8	38.6	37.5	36.4	35.2	34.1	33.0	31.9
	80	44.0	42.9	41.8	40.6	39.5	38.4	37.2	36.1	35.0	33.9	32.7	31.6	30.5
	70	41.8	40.7	39.6	38.4	37.3	36.2	35.1	33.9	32.8	31.7	30.5	29.4	28.3
	60	40.0	38.8	37.7	36.6	35.5	34.3	33.2	32.1	30.9	29.8	28.7	27.6	26.4
	50	38.3	37.1	36.0	34.9	33.7	32.6	31.5	30.4	29.2	28.1	27.0	25.8	24.7
	40	36.5	35.4	34.3	33.2	32.0	30.9	29.8	28.6	27.5	26.4	25.3	24.1	23.0
	30	34.7	33.6	32.4	31.3	30.2	29.0	27.9	26.8	25.7	24.5	23.4	22.3	21.1
	20	32.5	31.4	30.2	29.1	28.0	26.8	25.7	24.6	23.5	22.3	21.2	20.1	18.9
	15	31.1	30.0	28.9	27.7	26.6	25.5	24.3	23.2	22.1	21.0	19.8	18.7	17.6
	10	29.5	28.3	27.2	26.1	25.0	23.8	22.7	21.6	20.4	19.3	18.2	17.1	15.9
5	27.0	25.9	24.7	23.6	22.5	21.4	20.2	19.1	18.0	16.8	15.7	14.6	13.5	
1 to 12 years of education	95	39.3	38.1	37.0	35.9	34.8	33.6	32.5	31.4	30.2	29.1	28.0	26.9	25.7
	90	36.8	35.7	34.5	33.4	32.3	31.2	30.0	28.9	27.8	26.6	25.5	24.4	23.3
	85	35.1	34.0	32.9	31.8	30.6	29.5	28.4	27.3	26.1	25.0	23.9	22.7	21.6
	80	33.8	32.6	31.5	30.4	29.3	28.1	27.0	25.9	24.8	23.6	22.5	21.4	20.2
	70	31.6	30.5	29.3	28.2	27.1	25.9	24.8	23.7	22.6	21.4	20.3	19.2	18.0
	60	29.7	28.6	27.5	26.3	25.2	24.1	23.0	21.8	20.7	19.6	18.4	17.3	16.2
	50	28.0	26.9	25.8	24.6	23.5	22.4	21.2	20.1	19.0	17.9	16.7	15.6	14.5
	40	26.3	25.2	24.0	22.9	21.8	20.7	19.5	18.4	17.3	16.1	15.0	13.9	12.8
	30	24.4	23.3	22.2	21.1	19.9	18.8	17.7	16.5	15.4	14.3	13.2	12.0	10.9
	20	22.2	21.1	20.0	18.9	17.7	16.6	15.5	14.3	13.2	12.1	11.0	9.8	8.7
	15	20.9	19.7	18.6	17.5	16.4	15.2	14.1	13.0	11.8	10.7	9.6	8.5	7.3
	10	19.2	18.1	17.0	15.8	14.7	13.6	12.5	11.3	10.2	9.1	7.9	6.8	5.7
5	16.7	15.6	14.5	13.4	12.2	11.1	10.0	8.9	7.7	6.6	5.5	4.3	3.2	

Table A10
Normative data for the SDMT stratified by age and education levels for PERU

		Age (Years)												
Percentile		18–22	23–27	28–32	33–37	38–42	43–47	48–52	53–57	58–62	63–67	68–72	73–77	>77
> 12 years of education	95	69.6	67.6	65.5	63.5	61.5	59.5	57.5	55.5	53.4	51.4	49.4	47.4	45.4
	90	66.2	64.1	62.1	60.1	58.1	56.1	54.1	52.0	50.0	48.0	46.0	44.0	42.0
	85	63.9	61.9	59.9	57.8	55.8	53.8	51.8	49.8	47.7	45.7	43.7	41.7	39.7
	80	62.0	60.0	58.0	55.9	53.9	51.9	49.9	47.9	45.9	43.8	41.8	39.8	37.8
	70	59.0	56.9	54.9	52.9	50.9	48.9	46.9	44.8	42.8	40.8	38.8	36.8	34.7
	60	56.4	54.4	52.4	50.3	48.3	46.3	44.3	42.3	40.3	38.2	36.2	34.2	32.2
	50	54.0	52.0	50.0	48.0	46.0	43.9	41.9	39.9	37.9	35.9	33.8	31.8	29.8
	40	51.7	49.6	47.6	45.6	43.6	41.6	39.5	37.5	35.5	33.5	31.5	29.5	27.4
	30	49.1	47.1	45.1	43.0	41.0	39.0	37.0	35.0	33.0	30.9	28.9	26.9	24.9
	20	46.1	44.0	42.0	40.0	38.0	36.0	34.0	31.9	29.9	27.9	25.9	23.9	21.8
	15	44.2	42.1	40.1	38.1	36.1	34.1	32.1	30.0	28.0	26.0	24.0	22.0	19.9
	10	41.9	39.9	37.8	35.8	33.8	31.8	29.8	27.8	25.7	23.7	21.7	19.7	17.7
5	38.5	36.4	34.4	32.4	30.4	28.4	26.4	24.3	22.3	20.3	18.3	16.3	14.3	
1 to 12 years of education	95	60.2	58.2	56.1	54.1	52.1	50.1	48.1	46.1	44.0	42.0	40.0	38.0	36.0
	90	56.8	54.7	52.7	50.7	48.7	46.7	44.7	42.6	40.6	38.6	36.6	34.6	32.6
	85	54.5	52.5	50.5	48.4	46.4	44.4	42.4	40.4	38.4	36.3	34.3	32.3	30.3
	80	52.6	50.6	48.6	46.5	44.5	42.5	40.5	38.5	36.5	34.4	32.4	30.4	28.4
	70	49.6	47.5	45.5	43.5	41.5	39.5	37.5	35.4	33.4	31.4	29.4	27.4	25.3
	60	47.0	45.0	43.0	40.9	38.9	36.9	34.9	32.9	30.9	28.8	26.8	24.8	22.8
	50	44.6	42.6	40.6	38.6	36.6	34.5	32.5	30.5	28.5	26.5	24.4	22.4	20.4
	40	42.3	40.2	38.2	36.2	34.2	32.2	30.1	28.1	26.1	24.1	22.1	20.1	18.0
	30	39.7	37.7	35.7	33.6	31.6	29.6	27.6	25.6	23.6	21.5	19.5	17.5	15.5
	20	36.7	34.6	32.6	30.6	28.6	26.6	24.6	22.5	20.5	18.5	16.5	14.5	12.4
	15	34.8	32.7	30.7	28.7	26.7	24.7	22.7	20.6	18.6	16.6	14.6	12.6	10.5
	10	32.5	30.5	28.4	26.4	24.4	22.4	20.4	18.4	16.3	14.3	12.3	10.3	8.3
5	29.1	27.0	25.0	23.0	21.0	19.0	17.0	14.9	12.9	10.9	8.9	6.9	4.9	

Table A11
 Normative data for the SDMT stratified by age and education levels for PUERTO RICO

Percentile	Age (Years)													
	18-22	23-27	28-32	33-37	38-42	43-47	48-52	53-57	58-62	63-67	68-72	73-77	>77	
>12 years of education	95	77.8	75.1	72.5	69.8	67.1	64.5	61.8	59.1	56.5	53.8	51.1	48.5	45.8
	90	73.7	71.1	68.4	65.7	63.0	60.4	57.7	55.0	52.4	49.7	47.0	44.4	41.7
	85	71.0	68.3	65.7	63.0	60.3	57.6	55.0	52.3	49.6	47.0	44.3	41.6	39.0
	80	68.7	66.0	63.4	60.7	58.0	55.4	52.7	50.0	47.4	44.7	42.0	39.4	36.7
	70	65.1	62.4	59.7	57.1	54.4	51.7	49.1	46.4	43.7	41.1	38.4	35.7	33.1
	60	62.0	59.3	56.7	54.0	51.3	48.7	46.0	43.3	40.7	38.0	35.3	32.6	30.0
	50	59.2	56.5	53.8	51.1	48.5	45.8	43.1	40.5	37.8	35.1	32.5	29.8	27.1
	40	56.3	53.6	51.0	48.3	45.6	43.0	40.3	37.6	35.0	32.3	29.6	27.0	24.3
	30	53.2	50.6	47.9	45.2	42.6	39.9	37.2	34.6	31.9	29.2	26.6	23.9	21.2
	20	49.6	46.9	44.3	41.6	38.9	36.3	33.6	30.9	28.2	25.6	22.9	20.2	17.6
	15	47.3	44.6	42.0	39.3	36.6	34.0	31.3	28.6	26.0	23.3	20.6	18.0	15.3
	10	44.6	41.9	39.2	36.6	33.9	31.2	28.6	25.9	23.2	20.6	17.9	15.2	12.6
	5	40.5	37.8	35.2	32.5	29.8	27.1	24.5	21.8	19.1	16.5	13.8	11.1	8.5
1 to 12 years of education	95	72.8	70.1	67.5	64.8	62.1	59.5	56.8	54.1	51.5	48.8	46.1	43.5	40.8
	90	68.7	66.0	63.4	60.7	58.0	55.4	52.7	50.0	47.4	44.7	42.0	39.4	36.7
	85	66.0	63.3	60.6	58.0	55.3	52.6	50.0	47.3	44.6	42.0	39.3	36.6	34.0
	80	63.7	61.0	58.4	55.7	53.0	50.4	47.7	45.0	42.4	39.7	37.0	34.4	31.7
	70	60.1	57.4	54.7	52.1	49.4	46.7	44.1	41.4	38.7	36.0	33.4	30.7	28.0
	60	57.0	54.3	51.7	49.0	46.3	43.6	41.0	38.3	35.6	33.0	30.3	27.6	25.0
	50	54.1	51.5	48.8	46.1	43.5	40.8	38.1	35.5	32.8	30.1	27.5	24.8	22.1
	40	51.3	48.6	46.0	43.3	40.6	38.0	35.3	32.6	30.0	27.3	24.6	21.9	19.3
	30	48.2	45.6	42.9	40.2	37.6	34.9	32.2	29.5	26.9	24.2	21.5	18.9	16.2
	20	44.6	41.9	39.2	36.6	33.9	31.2	28.6	25.9	23.2	20.6	17.9	15.2	12.6
	15	42.3	39.6	37.0	34.3	31.6	29.0	26.3	23.6	21.0	18.3	15.6	13.0	10.3
	10	39.6	36.9	34.2	31.6	28.9	26.2	23.6	20.9	18.2	15.6	12.9	10.2	7.6
	5	35.5	32.8	30.1	27.5	24.8	22.1	19.5	16.8	14.1	11.5	8.8	6.1	3.5