NeuroRehabilitation 37 (2015) 677–698
DOI:10.3233/NRE-151285
IOS Press

Rey–Osterrieth Complex Figure – copy and immediate recall: Normative data for the Latin American Spanish speaking adult population

D. Rivera[a], P.B. Perrin[b], A. Morlett-Paredes[b], J. Galarza-del-Angel[c], C. Martínez[d], M.T. Garza[e], C.P. Saracho[f], W. Rodríguez[g], Y. Rodríguez-Agudelo[h], B. Rábago[i], A. Aliaga[j], S. Schebela[k], M. Luna[l], M. Longoni[m], N. Ocampo-Barba[n], E. Fernández[o], L. Esenarro[p], P. García-Egan[q] and J.C. Arango-Lasprilla[r,a,*]

[a]*Faculty of Psychology and Education, University of Deusto, Bilbao, Spain*
[b]*Department of Psychology, Virginia Commonwealth University, Richmond, VA, USA*
[c]*Universidad Autónoma de Baja California, Mexicali, Mexico*
[d]*Departamento de Medicina de Rehabilitación, Universidad Nacional Autónoma de Honduras, Tegucigalpa, Honduras*
[e]*Facultad de Psicología, Universidad Autónoma de Nuevo León, Monterrey, Mexico*
[f]*CETYS University, Mexicali, Mexico*
[g]*Ponce Health Sciences University, Ponce, Puerto Rico*
[h]*Instituto Nacional de Neurología y Neurocirugía MVS, Mexico City, Mexico*
[i]*Instituto Vocacional Enrique Díaz de León, Guadalajara, Mexico*
[j]*Servicio Médico Legal, Ministerio de Justicia, Santiago, Chile*
[k]*Instituto de Prevención Social, Asuncion, Paraguay*
[l]*Universidad Dr. José Matías Delgado, San Salvador, El Salvador*
[m]*Clínica de rehabilitación Las Araucarias, Buenos Aires, Argentina*
[n]*Fundación Horizontes, Santa Cruz de la Sierra, Bolivia*
[o]*International center for neurological Restoration CIREN, Havana, Cuba*
[p]*Instituto de Neuropsicología y Demencias, Lima, Peru*
[q]*Departamento de Psicología, Universidad del Valle de Guatemala, Guatemala City, Guatemala*
[r]*IKERBASQUE, Basque Foundation for Science, Bilbao, Spain*

Abstract.
OBJECTIVE: To generate normative data on the Rey-Osterrieth Complex Figure Test (ROCF) 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 ROCF as part of a larger neuropsychological battery. A standardized five-step statistical procedure was used to generate the norms.

*Address for correspondence: Juan Carlos Arango-Lasprilla, Ph.D., IKERBASQUE Research Professor, Department of Psychology, University of Deusto, IKERBASQUE, Basque Foundation for Science, Bilbao, Spain. Tel.: +34 804 859 4329; E-mail: jcarango@deusto.es.

RESULTS: The final multiple linear regression models explained 7–34% of the variance in ROCF copy scores and 21-41% of the variance in immediate recall scores. Although *t*-tests showed significant differences between men and women on ROCF copy and immediate recall scores, none of the countries had an effect size larger than 0.3. As a result, gender-adjusted norms were not generated.

CONCLUSIONS: The present study is the first to create norms for the ROCF in Latin America. As a result, this study will have important implications for the formation and practice of neuropsychology in this region.

Keywords: Normative data, Rey–Osterrieth Complex Figure, Latin America, visual perception, visual-spatial constructional ability, visual memory

1. Introduction

The Complex Figure Test was created to assess visual perception, visual-spatial constructional ability, and visual memory and was developed by Swiss psychologist Andre Rey in 1941 (Rey, 1941). In 1944, Paul-Alexandre Osterrieth developed a scoring system to standardize Rey's administration method and provided initial normative data on 230 children (ages 4–15) and 60 adults (16–60; Osterrieth, 1944, Meyers & Meyers, 1995; Strauss, Sherman, & Spreen, 2006). He proposed to subcategorize the figure into 18 elements and score them based on their presence, completeness, and correct placement.

Subsequently, the test has been referred to as the Rey-Osterrieth Complex Figure Test (ROCF) and is one of the most widely used neuropsychological tests for both clinical and research settings to examine visual spatial constructional ability and nonverbal memory skills (Somervile, Tremont, & Stern, 2000). It also has been theorized or shown to measure various cognitive dimensions, including problem and planning solving strategies (Lezak, Howieson, & Loring, 2004; Meyers & Meyers, 1995; Mitrushina, Boone, Razani, & D'Elia, 2005), attention and concentration levels, fine-motor coordination, and organizational skills (Helmes, 2000). In its recall conditions, it also aids the investigator to measure visual-spatial memory within declarative memory, which is connected to the hippocampus and related regions in the right temporal lobe (Lezak, 1995; Goder et al., 2004; Milner, 1975).

The ROCF is made up of a complex series of rectangles, lines, circles, triangles, and other geometric components (Rey, 1941). Participants are supplied with a sheet of paper and a pencil. Copying the ROCF by hand is a challenging task involving cognitively organizing the figure into a meaningful perceptual unit in order to reproduce it. Then, the participant must reproduce it again from memory three minutes later, although some authors have used a 30-minute delay (Peña-Casanova et al., 2009). Outcome measures include an copy score (which reflects the accuracy of the original copy and is a measure of visual-spatial constructional ability), time required to copy the figure, and immediate recall score (Peña-Casanova et al., 2009). The figure is distributed into 18 scored elements. Between 0 and 2 points are given for each element depending on the accuracy, distortion, and location of its duplication; 36 is the maximum score.

The ROCF has been used to examine impairments or cognitive processes in a plethora of neurological disorders (Machulda et al., 2007). Studies using the ROCF have revealed visual memory disturbance and recall deficits in individuals with schizophrenia (Calev, Edeist, Kugelmass, & Lerer, 1991; Knight, Sims-Knight, & Petchers-Cassell, 1977; Silverstein, Osborn, & Palumbo, 1998). Similarly, individuals with Alzheimer's disease (AD), Huntington's disease (HD), and Korsakoff's syndrome have shown poorer copy and recognition on the ROCF than controls (Shimamura, Salmon, Squire, & Butters, 1987; Tierney, Nores, Snow, Fisher, Zorzitto, & Reid, 1994). The ROCF has also been used in individuals with traumatic brain injury (Ashton, Donders, & Hoffman, 2005) and individuals with aneurysms of the anterior communicating artery (Diamon & DeLucas, 1996). Within the pediatric literature, the ROCF has been used to measure visuospatial perception, learning, and memory (Baron, 2000) in research with several populations including typically developing youth (Beebe, Ris, Brown, & Dietrich, 2004), and preterm children (Waber & McCormick, 1995), as well as children with phenylketonuria (Antshel & Waisbren, 2003), epilepsy (Hernandez et al., 2003), learning disabilities (Kirkwood, Weiler, Berstein, Forbes, & Waber, 2001), and ADHD (Sami, Carte, Hinshaw, & Zupan, 2003; Seidman et al.,1995).

A wide variety of studies have suggested demographic differences on the ROCF. Copy scores increase with age, with adult levels being reached at about age 17 (Meyers & Meyers, 1995). However, scores tend

to decrease with advancing age, particularly after age 70 (Chervinsky, Mitrushina, & Satz, 1992; Rosselli & Ardila, 1991; Chiulli, Haaland, LaRue, & Garry, 1995). Some studies have shown men to score better than women, but overall gender differences are minor or nonexistent (Berry, Allen, & Schmitt, 1991; Boone, Lesser, Hill-Gutierrez, Berman, & D'Elia, 1993; Peña-Casanova et al., 2009), and scores are also positively associated with education level (Ardila, Rosselli, & Rosas, 1989; Berry et al., 1991; Caffarra, Vezzadini, Dieci, Zonato, & Venneri, 2002). Additionally, African Americans have been shown to have lowers scores than Caucasians and Asian Americans, especially in visuo-construction. Moreover, those who spoke English as a native versus second language revealed significantly better ROCF copy. However, within the Hispanic group specifically, a comparison between those who spoke English as a first versus second language revealed superior performance by the latter group on ROCF copy (Boone, Victor, Wen, Razani, Ponton, 2007).

A series of limited studies have tried to establish norms for the ROCF in various populations. Palomo and colleagues (2013) provided normative data for the ROCF in a younger Spanish population from Andalusia, the Basque Country, Catalonia, Galicia, Madrid, and Murcia. Normative data based on a sample of 624 Spanish-Speaking children and adults living in Bogota Colombia, are reported by Rosselli and Ardila (2003). Caffarra et al. (2002) collected normative data in a large Italian sample with a wide age range from 20 to 89 years. Vogel, Stokholm and Jorgensen (2012), found normative data for an elderly Danish sample on the ROCF test. Moreover, normative data for Canadian children and adults aged 6–70 years old were found by Strauss et al. (2006). Finally, Fernando, Chard, Butcher, and McKay (2003) produced comprehensive New Zealand norms for children and adolescents, but not for adults.

Appropriate normative data are needed in order to assess memory correctly in other countries outside of the United Stated. Concerns have risen about the validity of using such norms when applied to other ethnic and cultural backgrounds (Knight et al., 1997; Lezak, 1995). To date, only limited normative data have been generated on the ROCF in Spanish or in Latin America, with samples limited to Colombia and Spain. Having different educational programs and cultural influences highlights the need for norms that are standardized for the Latin America population – hence the purpose of this study. Investigators need to be very careful when using neuropsychological tests with individuals from cultures different from the one that provided the normative sample. The interpretation of the performance of individuals from Latin America using norms from other countries and languages might result in significant errors in assessment. In light of this situation, when individuals from Latin America are being evaluated, it is important to do so with Latin American norms that take into consideration 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 $\geq$23 on the Mini-Mental State Examination (MMSE, Folstein, Folstein, & McHugh, 1975), g) scored $\leq$4 on the Patient Health Questionnaire–9 (PHQ-9, Kroenke, Spitzer, & Williams, 2001), and h) scored $\geq$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. Nine participants were excluded from the analyses, with a final sample of 3,968 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 examiner administered the ROCF Figure A (copy), and after 3 minutes, the immediate recall. The Spanish-language ROCF manual scoring guidelines were followed (Rey, 2009). The ROCF includes 18 elements, and the maximum score for each of the two tasks (copy and immediate recall) is 36. Two points are given

when the element is correctly reproduced, 1 point when the reproduction is distorted, incomplete but placed properly, or complete but placed poorly; 0.5 point is credited when the element is distorted or incomplete and placed poorly. A 0 score is given when the element is absent or is not recognizable (Osterrieth, 1944).

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 participant 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 multivariate 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* (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 ROCF copy scores and ROCF immediate recall scores.

3. Results

3.1. ROCF copy

Regarding the effect of gender on the ROCF copy scores, the t-tests showed significant differences between men and women in the countries of Bolivia, Honduras, Mexico, and Puerto Rico; however, none of these four countries had an effect size larger than 0.3. Table 1 shows the results of the gender analyses by country on the ROCF copy scores. As shown in Table 1,

Table 1
Effect of gender in the ROCF copy

Country	Gender	Mean (SD)	t	df	Sig. (2-tailed)	r
Argentina	Male	34.9 (2.4)	0.43	318	0.668	0.024
	Female	34.7 (2.8)				
Bolivia[a]	Male	27.6 (6.7)	3.13	239	0.002**	0.198
	Female	24.8 (8.2)				
Chile	Male	28.8 (8.4)	1.28	318	0.200	0.072
	Female	27.6 (8.3)				
Cuba	Male	31.4 (7.3)	–0.46	304	0.646	0.026
	Female	31.8 (6.6)				
El Salvador	Male	25.1 (9.1)	0.88	254	0.382	0.055
	Female	24.1 (9.0)				
Guatemala	Male	30.2 (6.4)	–1.42	210	0.156	0.098
	Female	31.9(5.4)				
Honduras[a]	Male	29.5 (7.8)	2.88	155.71	0.005**	0.225
	Female	25.8 (9.1)				
Mexico[a]	Male	31.7 (5.8)	4.74	947.96	<0.001***	0.152
	Female	30.0 (6.5)				
Paraguay	Male	29.5 (4.4)	1.76	261	0.079	0.108
	Female	28.6 (3.6)				
Peru	Male	34.3 (3.4)	0.31	239	0.759	0.020
	Female	34.2 (4.2)				
Puerto Rico[a]	Male	32.5 (5.2)	2.17	289.03	0.031*	0.127
	Female	31.0 (6.6)				

[a]Value of the t-test for independent groups from the different variances with the corresponding correction of Yuen-Welch of degrees of freedom.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table 2
Final multiple linear regression models for ROCF copy

Country		B	Std. Error	*t*	Sig.	R^2	SD_e (residual)
Argentina	(Constant)	35.030	0.419	83.557	<0.001	0.074	2.570
	Age	–0.018	0.007	–2.464	0.014		
	Education	1.169	0.292	4.007	<0.001		
Bolivia	(Constant)	33.123	1.163	28.487	<0.001	0.263	6.728
	Age	–0.147	0.019	–7.836	<0.001		
	Education	5.212	1.084	4.810	<0.001		
Chile	(Constant)	36.459	1.384	26.342	<0.001	0.203	7.430
	Age	–0.164	0.022	–7.363	<0.001		
	Education	2.793	1.010	2.765	0.006		
Cuba	(Constant)	38.546	1.054	36.565	<0.001	0.200	6.206
	Age	–0.143	0.018	–7.874	<0.001		
	Education	2.682	0.841	3.189	0.002		
El Salvador	(Constant)	29.457	1.468	20.065	<0.001	0.245	7.885
	Age	–0.121	0.024	–5.065	<0.001		
	Education	8.695	1.216	7.154	<0.001		
Guatemala	(Constant)	29.575	0.522	56.585	<0.001	0.130	6.302
	Age	–0.059	0.025	–2.352	0.020		
	Education	4.395	0.852	5.154	<0.001		
Honduras	(Constant)	32.994	1.749	18.868	<0.001	0.210	7.877
	Age	–0.148	0.032	–4.647	<0.001		
	Education	5.699	1.400	4.071	<0.001		
Mexico	(Constant)	34.330	0.485	70.791	<0.001	0.103	5.993
	Age	–0.081	0.008	–9.852	<0.001		
	Education	2.194	0.403	5.442	<0.001		
Paraguay	(Constant)	34.043	0.845	40.301	<0.001	0.342	3.201
	Age	–0.106	0.015	–7.264	<0.001		
	Education	3.046	0.565	5.394	<0.001		
Peru	(Constant)	36.290	0.635	57.158	<0.001	0.286	3.354
	Age	–0.079	0.011	–7.400	<0.001		
	Education	2.272	0.459	4.949	<0.001		
Puerto Rico	(Constant)	38.189	1.045	36.552	<0.001	0.254	5.275
	Age	–0.146	0.017	–8.406	<0.001		
	Education	1.910	0.642	2.972	0.003		

the effect sizes for all countries were less than 0.3, and therefore gender was not taken into account to generate ROCF copy normative data for any of the countries in the study.

The final eleven ROCF copy multivariate linear regression models for each country are shown in Table 2. In all countries, the ROCF copy score increased for those with more than 12 years of education (see Table 2) and, in all countries, ROCF copy scores decreased in a linear fashion as a function of age. The amount of variance explained in ROCF copy scores ranged from 7% (in Argentina) to 34% (in Paraguay).

3.2. ROCF immediate recall

Regarding the effect of gender on the ROCF immediate recall scores, the *t*-tests showed significant differences between men and women in the countries of Argentina, Bolivia, Chile, Cuba, Honduras, Mexico, Paraguay, and Puerto Rico. Table 3 shows the results of the gender analysis by country on ROCF immediate recall scores. As shown in Table 3, the effect sizes for all countries except Honduras were less than 0.3, and therefore gender was only taken into account to generate the ROCF immediate recall normative data for the Honduras sample.

The final eleven ROCF immediate recall multivariate linear regression models for each country are shown in Table 4. In all countries, ROCF immediate recall score increased for those with more than 12 years of education (see Table 4) and decreased in a linear fashion as a function of age. The amount of variance explained in ROCF immediate recall scores ranged from 21% (in Guatemala) to 41% (in El Salvador).

3.3. Normative procedure

Norms (e.g., a percentile score) for the ROCF copy and immediate recall scores were established using the five-step procedure described above. To facilitate the

Table 3
Effect of gender in the ROCF immediate recall

Country	Gender	Mean (SD)	*t*	df	Sig. (2-tailed)	*r*
Argentina	Male	24.7 (7.6)	3.25	318	0.001**	0.179
	Female	21.8 (7.4)				
Bolivia	Male	16.0 (8.5)	2.07	272	0.039*	0.125
	Female	13.9 (7.9)				
Chile[a]	Male	15.8 (9.0)	2.22	262.53	0.027	0.136
	Female	13.7 (7.9)				
Cuba	Male	20.9 (9.7)	2.40	304	0.017*	0.136
	Female	18.4 (8.8)				
El Salvador	Male	15.5 (8.5)	1.55	254	0.121	0.097
	Female	13.9 (7.8)				
Guatemala	Male	17.0 (7.4)	0.48	210	631	0.033
	Female	16.5 (7.3)				
Honduras	Male	18.2 (8.5)	4.45	182	<0.001***	0.313[b]
	Female	12.9 (7.5)				
Mexico	Male	19.5 (7.6)	6.34	1,296	<0.001***	0.173
	Female	16.7 (7.6)				
Paraguay[a]	Male	17.7 (5.6)	2.70	178.97	0.008	0.198
	Female	15.9 (4.5)				
Peru[a]	Male	19.9 (6.6)	–0.07	203.49	0.944	0.005
	Female	20.0 (8.2)				
Puerto Rico	Male	20.3 (9.2)	2.36	290	0.019*	0.138
	Female	17.8 (8.5)				

[a]Value of the *t*-test for independent groups from the different variances with the corresponding correction of Yuen-Welch of degrees of freedom.
[b]$r > 0.3$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

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 Chilean woman, who is 43 years old and has 14 years of education. She has a score of 30 on the ROCF copy 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 (Chile) on this test and time point (ROCF copy) is greater than 0.3 by country. The column labelled *r* in Table 1 indicates the effect size and the superscript notation *b* next to the number indicates that the number is larger than 0.3. In this example, the effect size is 0.072, which is not greater than 0.3. For Chileans on this test, gender does not influence scores to a sufficient degree to take it into account when determining the percentile. b) Find Chile in Table 2, which provides the final regression models by country for ROCF copy. Use the B weights to create an equation that will allow you to obtain the predicted ROCF copy 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 ROCF copy score would be calculated using the equation $[\hat{y}_i = 36.459 + (-0.164 \cdot Age_i) + (2.793 \cdot Dichotomized\,Educational\,Level_i)]$ (the values have been rounded for presentation in the formula). The subscript notation i indicates the person of interest. The person's age is 43, 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 14 years of education, her educational level value is 1. Thus the predicted value is $36.459 + (-0.164 \cdot 43) + (2.793 \cdot 1) = 36.459 - 7.052 + 2.793 = 32.2$. 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 $e_i = 30 - 32.2 = -2.2$. d) Next, consult the SD_e column in Table 2 to obtain the country-specific SD_e (residual) value. For Chile, it is 7.430. 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 $(-2.2)/7.430 = -0.296$. This is the standardized z score for a Chilean woman aged 43 and 14 years of education and a score of 30 on the ROCF copy test. e) The last step is to 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 -0.296

Table 4
Final multiple linear regression models for ROCF immediate recall

Country		B	Std. Error	*t*	Sig.	R^2	SD_e (residual)
Argentina	(Constant)	27.935	1.064	26.244	<0.001	0.254	6.526
	Age	–0.158	0.019	–8.364	<0.001		
	Education	3.685	0.741	4.974	<0.001		
Bolivia	(Constant)	23.489	1.217	19.296	<0.001	0.260	7.044
	Age	–0.169	0.020	–8.631	<0.001		
	Education	3.744	1.134	3.300	0.001		
Chile	(Constant)	23.533	1.380	17.059	<0.001	0.227	7.405
	Age	–0.175	0.022	–7.918	<0.001		
	Education	3.009	1.007	2.988	0.003		
Cuba	(Constant)	29.961	1.392	21.517	<0.001	0.223	8.198
	Age	–0.208	0.024	–8.715	<0.001		
	Education	3.026	1.111	2.724	0.007		
El Salvador	(Constant)	23.383	1.177	19.863	<0.001	0.409	6.323
	Age	–0.188	0.019	–9.798	<0.001		
	Education	8.005	0.975	8.212	<0.001		
Guatemala	(Constant)	23.495	1.500	15.666	<0.001	0.210	6.327
	Age	–0.155	0.026	–5.959	<0.001		
	Education	3.687	0.930	3.965	<0.001		
Honduras	(Constant)	19.640	1.555	12.628	<0.001	0.371	6.567
	Age	–0.159	0.027	–5.922	<0.001		
	Education	6.148	1.172	5.247	<0.001		
	Gender (Female)	4.049	1.027	3.944	<0.001		
Mexico	(Constant)	25.146	0.546	46.039	<0.001	0.226	6.750
	Age	–0.156	0.009	–16.845	<0.001		
	Education	3.117	0.454	6.864	<0.001		
Paraguay	(Constant)	21.482	1.155	18.600	<0.001	0.237	4.377
	Age	–0.104	0.020	–5.200	<0.001		
	Education	3.569	0.772	4.622	<0.001		
Peru	(Constant)	26.392	1.166	22.631	<0.001	0.360	6.147
	Age	–0.195	0.020	–9.889	<0.001		
	Education	3.404	0.844	4.034	<0.001		
Puerto Rico	(Constant)	31.879	1.364	23.375	<0.001	0.398	6.886
	Age	–0.279	0.023	–12.289	<0.001		
	Education	2.520	0.839	3.005	0.003		

corresponds to the 38th percentile. Please remember to use the appropriate tables that correspond to each test (copy vs. immediate recall) when performing these calculations. If the percentile for the ROCF immediate recall score is desired, Tables 3 and 4 must be used.

3.4. 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 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 (ROCF copy vs. ROCF immediate recall) in the Appendix. In order to obtain an approximate percentile for the above example (converting a raw score of 30 for a Chilean woman who is 43 years old and has 14 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 the ROCF copy scores for Chile can be found in Table A3. (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 A3 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 14 years of education, she falls into the >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, 43 falls into the column 43–47 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 43–47 column, the score of 30 obtained by this Chilean woman corresponds to an approximate percentile of 40.

The percentile obtained via this user-friendly table method (40th) is slightly different than the more exact one (38th) obtained following the individual conversion steps above because the table method is based on an age range (e.g., individuals aged 43–47) instead of the exact age (individuals aged 43). If the exact score is not listed in the column, you must estimate the percentile value from the listed raw scores.

4. Discussion

The purpose of the current study was to generate normative data on the ROCF 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 7.4–34% of the variance in the ROCF copy scores and between 21–40% in immediate recall scores.

Although men outperformed women on the ROCF copy in four of the 11 countries, the effect sizes were all small, and therefore gender-adjusted norms were not generated. For the ROCF immediate recall, men outperformed women in seven countries, with only the difference in Honduras reaching a medium-sized effect. As a result, gender-adjusted norms were only generated for Honduras on the immediate recall. These findings are generally consistent with the previous literature, where some studies have shown men to outperform women on the ROCF, although these effects have been inconsistent or small when present (Berry et al., 1991; Boone et al., 1993; Peña-Casanova et al., 2009). In light of the previous literature, the current results suggest that gender should not be taken into account in calculating participants' percentiles for the ROCF in the vast majority of countries in Latin America when using the current norms, with the exception of Honduras on the ROCF immediate recall.

The ROCF copy and immediate recall scores both increased linearly as a function of education in all countries. These findings were extremely consistent within the current study, as well as with previous studies on the ROCF (Ardila, Rosselli, & Rosas, 1989; Berry et al., 1991; Caffarra et al., 2002). Because of potentially substantial differences in the quality of education across different countries in Latin America, it is extremely important to use the specific education-adjusted norms generated for a single country when administering the ROCF to individuals from that country.

Age was inversely associated with ROCF copy scores in all countries except Guatemala, and age was also inversely associated with immediate recall scores in all countries. As a result, age-adjusted norms were calculated for all countries except for Guatemala on the ROCF copy. The current findings are in line with the previous literature which has shown that ROCF scores tend to decrease with advancing age, especially in individuals who are above age 70 (Chervinsky et al., 1992; Rosselli & Ardila, 1991; Chiulli et al., 1995). As with education, it is important that neuropsychologists in Latin America use the current age-adjusted norms for their specific country, with the exception of Guatemala on the copy only.

4.1. Limitations and future directions

The current study has several limitations, and as a result directions for future research. First, although the study was conducted in 11 countries, caution should be exercised in generalizing the norms of the ROCF from this study to other countries in Latin America where data were not collected. Future studies should establish norms for the ROCF in countries like Ecuador, Uruguay, Venezuela, and Panama, among others. However, the ROCF norms from the current study may be more accurate in these countries than the norms from Spain or English-speaking countries with different cultures which are likely currently being used, although this assertion direly needs support from future research.

Second, several sampling limitations are notable. It is important to emphasize that although participants were included with fewer than 12 years of education, illiterate individuals were excluded from the current study, so the ROCF norms cannot generalize to this population. Future studies should norm the ROCF in individuals who are unable to read and write. Similarly, no participants in the current study had neurological conditions, and all participants were adults; future similar studies should be conducted in populations of various neurological conditions, as well as among pediatric populations. Future research should also collect data on participants' bilingualism, which was not controlled for in the current study. Participants only had to have Spanish as their primary language, and performance on the ROCF could be different if people speak other languages such as English, or local dialects such as Quechua or Guaraní. Future research should explore

the possible influence of bilingualism on ROCF performance. A final sampling limitation is that the data were generally collected in specific regions of the countries in the current study, as opposed to nationally in those countries. Although the current study was the largest neuropsychological normative study in the history of Latin America, it should be seen as a first step in conducting more rigorous and larger studies with nationally representative samples.

Third, although the ROCF is a one of the most common neuropsychological instruments used in Latin America, many other instruments are also common in Latin America that should be normed in the same manner. Despite its commonness, the ROCF was created in a Western culture that may be different from those in Latin America. There is a great need for future research to develop more culturally sensitive tests that are bound in local cultures, not just translate and norm those that were developed in other countries and cultures. Future research should examine the psychometric properties of common neuropsychological instruments in Latin America, as well as test whether the instruments have strong ecological validity, and if not, develop instruments in those cultures that are more ecologically valid.

Despite these limitations and although previous studies have produced Spanish-language norms for the ROCF in Spain (Palomo et al., 2013) and Colombia (Rosselli & Ardila, 2003), this study was the first to generate ROCF norms across 11 countries in Latin America with nearly 4,000 participants. This study was the largest and most comprehensive ROCF normative study conducted to date in any global region, and as a result, its norms have the potential to affect the standard of neuropsychological assessment with the ROCF in Latin America unlike any study before it.

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Appendix

Table A1
Normative data for the ROCF copy 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	–	–	–	–	–	–	–	–	–	–	–	–	–
	90	–	–	–	–	–	–	–	–	–	–	–	–	–
	85	–	–	–	–	–	–	–	–	–	–	–	–	–
	80	–	–	–	–	–	–	–	–	–	–	–	–	–
	70	–	–	–	–	–	–	36.0	36.0	36.0	36.0	36.0	36.0	36.0
	60	36.0	36.0	36.0	36.0	36.0	36.0	35.9	35.8	35.7	35.6	35.6	35.5	35.4
	50	35.8	35.7	35.6	35.6	35.5	35.4	35.3	35.2	35.1	35.0	34.9	34.8	34.7
	40	35.2	35.1	35.0	34.9	34.8	34.7	34.6	34.5	34.5	34.4	34.3	34.2	34.1
	30	34.5	34.4	34.3	34.2	34.1	34.0	33.9	33.9	33.8	33.7	33.6	33.5	33.4
	20	33.7	33.6	33.5	33.4	33.3	33.2	33.1	33.0	32.9	32.8	32.8	32.7	32.6
	15	33.2	33.1	33.0	32.9	32.8	32.7	32.6	32.5	32.4	32.3	32.2	32.1	32.1
	10	32.5	32.4	32.4	32.3	32.2	32.1	32.0	31.9	31.8	31.7	31.6	31.5	31.4
	5	31.6	31.5	31.4	31.3	31.2	31.2	31.1	31.0	30.9	30.8	30.7	30.6	30.5
1 to 12 years of education	95	–	–	–	–	–	–	–	–	–	–	–	–	–
	90	–	–	–	–	–	–	–	–	–	–	–	–	–
	85	–	–	–	–	–	–	–	–	–	–	36.0	36.0	36.0
	80	–	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	35.9	35.8	35.7
	70	36.0	35.9	35.8	35.7	35.6	35.5	35.4	35.4	35.3	35.2	35.1	35.0	34.9
	60	35.3	35.2	35.1	35.0	34.9	34.8	34.8	34.7	34.6	34.5	34.4	34.3	34.2
	50	34.7	34.6	34.5	34.4	34.3	34.2	34.1	34.0	33.9	33.8	33.7	33.7	33.6
	40	34.0	33.9	33.8	33.7	33.7	33.6	33.5	33.4	33.3	33.2	33.1	33.0	32.9
	30	33.3	33.2	33.1	33.0	33.0	32.9	32.8	32.7	32.6	32.5	32.4	32.3	32.2
	20	32.5	32.4	32.3	32.2	32.1	32.0	32.0	31.9	31.8	31.7	31.6	31.5	31.4
	15	32.0	31.9	31.8	31.7	31.6	31.5	31.4	31.3	31.3	31.2	31.1	31.0	30.9
	10	31.4	31.3	31.2	31.1	31.0	30.9	30.8	30.7	30.6	30.5	30.5	30.4	30.3
	5	30.4	30.4	30.3	30.2	30.1	30.0	29.9	29.8	29.7	29.6	29.5	29.4	29.3

Table A2
Normative data for the ROCF copy 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	–	–	–	–	–	–	–	–	–	–	–	36.0	36.0
	90	–	–	–	–	–	–	–	–	–	36.0	36.0	35.9	35.2
	85	–	–	–	–	–	–	–	36.0	36.0	35.8	35.0	34.3	33.6
	80	–	–	–	–	–	36.0	36.0	35.9	35.2	34.4	33.7	33.0	32.2
	70	–	–	36.0	36.0	36.0	35.2	34.5	33.8	33.0	32.3	31.5	30.8	30.1
	60	36.0	36.0	35.6	34.9	34.1	33.4	32.7	31.9	31.2	30.5	29.7	29.0	28.3
	50	35.4	34.7	33.9	33.2	32.5	31.7	31.0	30.3	29.5	28.8	28.0	27.3	26.6
	40	33.7	33.0	32.2	31.5	30.8	30.0	29.3	28.6	27.8	27.1	26.4	25.6	24.9
	30	31.9	31.2	30.4	29.7	29.0	28.2	27.5	26.8	26.0	25.3	24.6	23.8	23.1
	20	29.7	29.0	28.3	27.5	26.8	26.1	25.3	24.6	23.9	23.1	22.4	21.7	20.9
	15	28.4	27.7	26.9	26.2	25.5	24.7	24.0	23.3	22.5	21.8	21.1	20.3	19.6
	10	26.8	26.0	25.3	24.6	23.8	23.1	22.4	21.6	20.9	20.2	19.4	18.7	18.0
	5	24.4	23.6	22.9	22.2	21.4	20.7	20.0	19.2	18.5	17.8	17.0	16.3	15.5
1 to 12 years of education	95	–	–	–	–	36.0	36.0	36.0	36.0	35.3	34.6	33.9	33.1	32.4
	90	–	–	36.0	36.0	35.9	35.1	34.4	33.7	32.9	32.2	31.4	30.7	30.0
	85	36.0	36.0	35.7	35.0	34.2	33.5	32.8	32.0	31.3	30.6	29.8	29.1	28.4
	80	35.8	35.1	34.4	33.6	32.9	32.2	31.4	30.7	30.0	29.2	28.5	27.8	27.0
	70	33.7	32.9	32.2	31.5	30.7	30.0	29.3	28.5	27.8	27.1	26.3	25.6	24.9
	60	31.9	31.1	30.4	29.7	28.9	28.2	27.5	26.7	26.0	25.3	24.5	23.8	23.1
	50	30.2	29.4	28.7	28.0	27.2	26.5	25.8	25.0	24.3	23.6	22.8	22.1	21.4
	40	28.5	27.8	27.0	26.3	25.6	24.8	24.1	23.4	22.6	21.9	21.2	20.4	19.7
	30	26.7	26.0	25.2	24.5	23.7	23.0	22.3	21.5	20.8	20.1	19.3	18.6	17.9
	20	24.5	23.8	23.1	22.3	21.6	20.9	20.1	19.4	18.7	17.9	17.2	16.5	15.7
	15	23.2	22.5	21.7	21.0	20.2	19.5	18.8	18.0	17.3	16.6	15.8	15.1	14.4
	10	21.6	20.8	20.1	19.4	18.6	17.9	17.2	16.4	15.7	15.0	14.2	13.5	12.8
	5	19.2	18.4	17.7	16.9	16.2	15.5	14.7	14.0	13.3	12.5	11.8	11.1	10.3

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

		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	–	–	–	–	–	–	–	–	–	–	–	–	36.0
	90	–	–	–	–	–	–	–	–	–	–	36.0	36.0	35.7
	85	–	–	–	–	–	–	–	–	36.0	36.0	35.5	34.7	33.9
	80	–	–	–	–	–	36.0	36.0	36.0	35.7	34.9	34.0	33.2	32.4
	70	–	–	–	36.0	36.0	35.7	34.9	34.1	33.3	32.5	31.7	30.8	30.0
	60	–	36.0	36.0	35.4	34.6	33.7	32.9	32.1	31.3	30.5	29.7	28.8	28.0
	50	36.0	35.2	34.3	33.5	32.7	31.9	31.1	30.2	29.4	28.6	27.8	27.0	26.2
	40	34.1	33.3	32.5	31.7	30.8	30.0	29.2	28.4	27.6	26.8	25.9	25.1	24.3
	30	32.1	31.3	30.5	29.7	28.8	28.0	27.2	26.4	25.6	24.7	23.9	23.1	22.3
	20	29.7	28.9	28.1	27.3	26.5	25.6	24.8	24.0	23.2	22.4	21.6	20.7	19.9
	15	28.3	27.4	26.6	25.8	25.0	24.2	23.3	22.5	21.7	20.9	20.1	19.2	18.4
	10	26.5	25.6	24.8	24.0	23.2	22.4	21.6	20.7	19.9	19.1	18.3	17.5	16.6
	5	23.8	23.0	22.2	21.3	20.5	19.7	18.9	18.1	17.2	16.4	15.6	14.8	14.0
1 to 12 years of education	95	–	–	–	–	–	–	–	–	–	36.0	36.0	36.0	35.5
	90	–	–	–	–	–	–	–	36.0	36.0	35.3	34.5	33.7	32.9
	85	–	–	–	–	–	36.0	36.0	35.2	34.4	33.5	32.7	31.9	31.1
	80	–	–	36.0	36.0	36.0	35.3	34.5	33.7	32.9	32.1	31.2	30.4	29.6
	70	36.0	36.0	35.4	34.6	33.8	33.0	32.1	31.3	30.5	29.7	28.9	28.0	27.2
	60	35.0	34.2	33.4	32.6	31.8	31.0	30.1	29.3	28.5	27.7	26.9	26.0	25.2
	50	33.2	32.4	31.5	30.7	29.9	29.1	28.3	27.5	26.6	25.8	25.0	24.2	23.4
	40	31.3	30.5	29.7	28.9	28.1	27.2	26.4	25.6	24.8	24.0	23.1	22.3	21.5
	30	29.3	28.5	27.7	26.9	26.0	25.2	24.4	23.6	22.8	22.0	21.1	20.3	19.5
	20	26.9	26.1	25.3	24.5	23.7	22.9	22.0	21.2	20.4	19.6	18.8	17.9	17.1
	15	25.5	24.6	23.8	23.0	22.2	21.4	20.5	19.7	18.9	18.1	17.3	16.5	15.6
	10	23.7	22.9	22.0	21.2	20.4	19.6	18.8	17.9	17.1	16.3	15.5	14.7	13.9
	5	21.0	20.2	19.4	18.5	17.7	16.9	16.1	15.3	14.5	13.6	12.8	12.0	11.2

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

		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	–	–	–	–	–	–	–	–	–	–	–	–	–
	90	–	–	–	–	–	–	–	–	–	–	–	–	–
	85	–	–	–	–	–	–	–	–	–	–	–	36.0	36.0
	80	–	–	–	–	–	–	–	–	36.0	36.0	36.0	35.7	35.0
	70	–	–	–	–	–	–	36.0	36.0	35.9	35.2	34.5	33.8	33.1
	60	–	–	–	–	36.0	36.0	35.7	34.9	34.2	33.5	32.8	32.1	31.4
	50	–	–	36.0	36.0	35.5	34.8	34.1	33.4	32.7	32.0	31.2	30.5	29.8
	40	36.0	36.0	35.4	34.7	34.0	33.3	32.5	31.8	31.1	30.4	29.7	29.0	28.3
	30	35.1	34.4	33.7	33.0	32.3	31.6	30.9	30.2	29.4	28.7	28.0	27.3	26.6
	20	33.2	32.5	31.7	31.0	30.3	29.6	28.9	28.2	27.5	26.7	26.0	25.3	24.6
	15	31.9	31.2	30.5	29.8	29.1	28.4	27.6	26.9	26.2	25.5	24.8	24.1	23.4
	10	30.4	29.7	29.0	28.3	27.6	26.9	26.2	25.4	24.7	24.0	23.3	22.6	21.9
	5	28.2	27.5	26.8	26.1	25.3	24.6	23.9	23.2	22.5	21.8	21.1	20.4	19.6
1 to 12 years of education	95	–	–	–	–	–	–	–	–	–	–	–	36.0	36.0
	90	–	–	–	–	–	–	–	–	–	36.0	36.0	35.8	35.1
	85	–	–	–	–	–	–	–	36.0	36.0	35.7	35.0	34.3	33.6
	80	–	–	–	–	–	36.0	36.0	35.9	35.2	34.5	33.8	33.1	32.4
	70	–	–	36.0	36.0	36.0	35.4	34.6	33.9	33.2	32.5	31.8	31.1	30.4
	60	36.0	36.0	35.8	35.1	34.4	33.7	33.0	32.3	31.5	30.8	30.1	29.4	28.7
	50	35.7	35.0	34.3	33.6	32.8	32.1	31.4	30.7	30.0	29.3	28.6	27.9	27.1
	40	34.1	33.4	32.7	32.0	31.3	30.6	29.9	29.2	28.4	27.7	27.0	26.3	25.6
	30	32.5	31.8	31.0	30.3	29.6	28.9	28.2	27.5	26.8	26.1	25.3	24.6	23.9
	20	30.5	29.8	29.1	28.3	27.6	26.9	26.2	25.5	24.8	24.1	23.4	22.6	21.9
	15	29.2	28.5	27.8	27.1	26.4	25.7	25.0	24.3	23.5	22.8	22.1	21.4	20.7
	10	27.8	27.0	26.3	25.6	24.9	24.2	23.5	22.8	22.0	21.3	20.6	19.9	19.2
	5	25.5	24.8	24.1	23.4	22.7	22.0	21.2	20.5	19.8	19.1	18.4	17.7	17.0

Table A5
Normative data for the ROCF copy 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	–	–	–	–	–	–	–	–	–	–	–	–	–
	90	–	–	–	–	–	–	–	–	–	–	–	–	–
	85	–	–	–	–	–	–	–	–	–	–	–	36.0	36.0
	80	–	–	–	–	–	–	–	36.0	36.0	36.0	36.0	35.7	35.1
	70	–	–	–	36.0	36.0	36.0	36.0	35.6	35.0	34.4	33.8	33.2	32.6
	60	36.0	36.0	36.0	35.9	35.3	34.7	34.1	33.5	32.8	32.2	31.6	31.0	30.4
	50	35.7	35.1	34.5	33.9	33.3	32.7	32.1	31.5	30.9	30.3	29.7	29.1	28.5
	40	33.8	33.1	32.5	31.9	31.3	30.7	30.1	29.5	28.9	28.3	27.7	27.1	26.5
	30	31.6	31.0	30.4	29.8	29.2	28.6	28.0	27.4	26.8	26.2	25.6	25.0	24.4
	20	29.1	28.5	27.9	27.3	26.7	26.1	25.5	24.9	24.3	23.6	23.0	22.4	21.8
	15	27.5	26.9	26.3	25.7	25.1	24.5	23.9	23.3	22.7	22.1	21.5	20.9	20.3
	10	25.6	25.0	24.4	23.8	23.2	22.6	22.0	21.4	20.8	20.2	19.6	19.0	18.4
	5	22.8	22.2	21.6	21.0	20.4	19.8	19.2	18.6	17.9	17.3	16.7	16.1	15.5
1 to 12 years of education	95	–	–	36.0	36.0	36.0	36.0	36.0	35.7	35.1	34.5	33.9	33.3	32.7
	90	36.0	36.0	35.9	35.3	34.7	34.1	33.5	32.9	32.3	31.7	31.1	30.5	29.8
	85	35.2	34.6	34.0	33.4	32.8	32.2	31.6	31.0	30.4	29.8	29.2	28.6	28.0
	80	33.7	33.0	32.4	31.8	31.2	30.6	30.0	29.4	28.8	28.2	27.6	27.0	26.4
	70	31.1	30.5	29.9	29.3	28.7	28.1	27.5	26.9	26.3	25.7	25.1	24.5	23.9
	60	29.0	28.4	27.8	27.2	26.6	26.0	25.4	24.8	24.2	23.5	22.9	22.3	21.7
	50	27.0	26.4	25.8	25.2	24.6	24.0	23.4	22.8	22.2	21.6	21.0	20.4	19.8
	40	25.1	24.5	23.8	23.2	22.6	22.0	21.4	20.8	20.2	19.6	19.0	18.4	17.8
	30	22.9	22.3	21.7	21.1	20.5	19.9	19.3	18.7	18.1	17.5	16.9	16.3	15.7
	20	20.4	19.8	19.2	18.6	18.0	17.4	16.8	16.2	15.6	15.0	14.3	13.7	13.1
	15	18.8	18.2	17.6	17.0	16.4	15.8	15.2	14.6	14.0	13.4	12.8	12.2	11.6
	10	16.9	16.3	15.7	15.1	14.5	13.9	13.3	12.7	12.1	11.5	10.9	10.3	9.7
	5	14.1	13.5	12.9	12.3	11.7	11.1	10.5	9.9	9.3	8.6	8.0	7.4	6.8

Table A6
Normative data for the ROCF copy stratified by age and 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	–	–	–	–	–	–	–	–	–	–	–	–	–
	90	–	–	–	–	–	–	–	–	–	–	–	–	–
	85	–	–	–	–	–	–	–	–	–	–	–	–	–
	80	–	–	–	–	–	–	–	–	–	–	36.0	36.0	36.0
	70	–	–	–	–	36.0	36.0	36.0	36.0	36.0	36.0	35.8	35.5	35.2
	60	36.0	36.0	36.0	36.0	35.9	35.6	35.3	35.0	34.7	34.4	34.1	33.8	33.5
	50	35.5	35.2	34.9	34.6	34.3	34.0	33.7	33.4	33.1	32.8	32.6	32.3	32.0
	40	33.9	33.6	33.3	33.0	32.7	32.5	32.2	31.9	31.6	31.3	31.0	30.7	30.4
	30	32.2	31.9	31.6	31.3	31.0	30.7	30.5	30.2	29.9	29.6	29.3	29.0	28.7
	20	30.2	29.9	29.6	29.3	29.0	28.7	28.4	28.1	27.8	27.6	27.3	27.0	26.7
	15	28.9	28.7	28.4	28.1	27.8	27.5	27.2	26.9	26.6	26.3	26.0	25.7	25.4
	10	27.4	27.1	26.8	26.5	26.3	26.0	25.7	25.4	25.1	24.8	24.5	24.2	23.9
	5	25.2	24.9	24.6	24.3	24.0	23.7	23.4	23.1	22.8	22.5	22.2	21.9	21.6
1 to 12 years of education	95	–	–	–	–	–	–	–	–	–	–	–	36.0	36.0
	90	–	–	–	–	–	–	36.0	36.0	36.0	36.0	36.0	35.8	35.5
	85	–	–	36.0	36.0	36.0	36.0	35.8	35.5	35.2	34.9	34.6	34.3	34.0
	80	36.0	36.0	35.7	35.4	35.1	34.8	34.5	34.2	33.9	33.6	33.4	33.1	32.8
	70	34.3	34.0	33.7	33.4	33.1	32.8	32.5	32.2	31.9	31.6	31.3	31.0	30.7
	60	32.6	32.3	32.0	31.7	31.4	31.1	30.8	30.5	30.2	29.9	29.6	29.3	29.0
	50	31.0	30.7	30.4	30.1	29.8	29.5	29.2	28.9	28.6	28.4	28.1	27.8	27.5
	40	29.4	29.1	28.8	28.5	28.3	28.0	27.7	27.4	27.1	26.8	26.5	26.2	25.9
	30	27.7	27.4	27.1	26.8	26.5	26.3	26.0	25.7	25.4	25.1	24.8	24.5	24.2
	20	25.7	25.4	25.1	24.8	24.5	24.2	23.9	23.6	23.4	23.1	22.8	22.5	22.2
	15	24.5	24.2	23.9	23.6	23.3	23.0	22.7	22.4	22.1	21.8	21.5	21.2	20.9
	10	22.9	22.6	22.3	22.1	21.8	21.5	21.2	20.9	20.6	20.3	20.0	19.7	19.4
	5	20.7	20.4	20.1	19.8	19.5	19.2	18.9	18.6	18.3	18.0	17.7	17.4	17.1

Table A7
Normative data for the ROCF copy 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	–	–	–	–	–	–	–	–	–	–	–	–	–
	90	–	–	–	–	–	–	–	–	–	–	–	36.0	36.0
	85	–	–	–	–	–	–	–	–	–	36.0	36.0	35.8	35.1
	80	–	–	–	–	–	–	36.0	36.0	36.0	35.7	35.0	34.2	33.5
	70	–	–	–	36.0	36.0	36.0	35.4	34.7	33.9	33.2	32.4	31.7	31.0
	60	36.0	36.0	36.0	35.5	34.7	34.0	33.3	32.5	31.8	31.1	30.3	29.6	28.8
	50	35.7	35.0	34.3	33.5	32.8	32.0	31.3	30.6	29.8	29.1	28.3	27.6	26.9
	40	33.8	33.0	32.3	31.6	30.8	30.1	29.3	28.6	27.9	27.1	26.4	25.6	24.9
	30	31.6	30.9	30.2	29.4	28.7	27.9	27.2	26.5	25.7	25.0	24.3	23.5	22.8
	20	29.1	28.4	27.6	26.9	26.2	25.4	24.7	23.9	23.2	22.5	21.7	21.0	20.3
	15	27.5	26.8	26.1	25.3	24.6	23.8	23.1	22.4	21.6	20.9	20.2	19.4	18.7
	10	25.7	24.9	24.2	23.4	22.7	22.0	21.2	20.5	19.7	19.0	18.3	17.5	16.8
	5	22.8	22.1	21.3	20.6	19.9	19.1	18.4	17.6	16.9	16.2	15.4	14.7	14.0
1 to 12 years of education	95	–	–	–	–	–	–	36.0	36.0	36.0	36.0	35.6	34.8	34.1
	90	–	–	–	–	36.0	36.0	35.7	34.9	34.2	33.5	32.7	32.0	31.3
	85	–	–	36.0	36.0	35.3	34.5	33.8	33.1	32.3	31.6	30.8	30.1	29.4
	80	36.0	36.0	35.2	34.4	33.7	33.0	32.2	31.5	30.7	30.0	29.3	28.5	27.8
	70	34.1	33.4	32.7	31.9	31.2	30.4	29.7	29.0	28.2	27.5	26.7	26.0	25.3
	60	32.0	31.3	30.5	29.8	29.1	28.3	27.6	26.8	26.1	25.4	24.6	23.9	23.1
	50	30.0	29.3	28.6	27.8	27.1	26.3	25.6	24.9	24.1	23.4	22.6	21.9	21.2
	40	28.1	27.3	26.6	25.9	25.1	24.4	23.6	22.9	22.2	21.4	20.7	19.9	19.2
	30	25.9	25.2	24.5	23.7	23.0	22.2	21.5	20.8	20.0	19.3	18.6	17.8	17.1
	20	23.4	22.7	21.9	21.2	20.5	19.7	19.0	18.2	17.5	16.8	16.0	15.3	14.6
	15	21.8	21.1	20.4	19.6	18.9	18.2	17.4	16.7	15.9	15.2	14.5	13.7	13.0
	10	20.0	19.2	18.5	17.7	17.0	16.3	15.5	14.8	14.0	13.3	12.6	11.8	11.1
	5	17.1	16.4	15.6	14.9	14.2	13.4	12.7	11.9	11.2	10.5	9.7	9.0	8.3

Table A8
Normative data for the ROCF copy 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	–	–	–	–	–	–	–	–	–	–	–	–	–
	90	–	–	–	–	–	–	–	–	–	–	–	–	–
	85	–	–	–	–	–	–	–	–	–	–	36.0	36.0	36.0
	80	–	–	–	–	–	–	36.0	36.0	36.0	36.0	35.9	35.5	35.1
	70	–	–	36.0	36.0	36.0	36.0	35.6	35.2	34.8	34.4	34.0	33.6	33.2
	60	36.0	36.0	35.6	35.2	34.8	34.4	34.0	33.6	33.2	32.8	32.4	32.0	31.5
	50	34.9	34.5	34.1	33.7	33.3	32.9	32.5	32.1	31.7	31.3	30.9	30.5	30.0
	40	33.4	33.0	32.6	32.2	31.8	31.4	31.0	30.6	30.2	29.8	29.4	29.0	28.6
	30	31.8	31.4	31.0	30.6	30.2	29.8	29.4	29.0	28.6	28.1	27.7	27.3	26.9
	20	29.9	29.5	29.1	28.7	28.3	27.8	27.4	27.0	26.6	26.2	25.8	25.4	25.0
	15	28.7	28.3	27.9	27.5	27.1	26.6	26.2	25.8	25.4	25.0	24.6	24.2	23.8
	10	27.2	26.8	26.4	26.0	25.6	25.2	24.8	24.4	24.0	23.6	23.2	22.8	22.4
	5	25.1	24.7	24.3	23.9	23.5	23.1	22.6	22.2	21.8	21.4	21.0	20.6	20.2
1 to 12 years of education	95	–	–	–	–	–	–	–	–	–	–	–	36.0	36.0
	90	–	–	–	–	–	–	–	–	36.0	36.0	36.0	35.9	35.5
	85	–	–	–	–	–	36.0	36.0	36.0	35.7	35.3	34.9	34.5	34.1
	80	36.0	36.0	36.0	36.0	36.0	35.7	35.3	34.9	34.5	34.1	33.7	33.3	32.9
	70	35.8	35.4	35.0	34.6	34.2	33.8	33.4	33.0	32.6	32.2	31.8	31.4	31.0
	60	34.2	33.8	33.4	33.0	32.6	32.2	31.8	31.4	31.0	30.6	30.2	29.8	29.4
	50	32.7	32.3	31.9	31.5	31.1	30.7	30.3	29.9	29.5	29.1	28.7	28.3	27.9
	40	31.2	30.8	30.4	30.0	29.6	29.2	28.8	28.4	28.0	27.6	27.2	26.8	26.4
	30	29.6	29.2	28.8	28.4	28.0	27.6	27.2	26.8	26.4	26.0	25.5	25.1	24.7
	20	27.7	27.3	26.9	26.5	26.1	25.7	25.2	24.8	24.4	24.0	23.6	23.2	22.8
	15	26.5	26.1	25.7	25.3	24.9	24.5	24.1	23.6	23.2	22.8	22.4	22.0	21.6
	10	25.0	24.6	24.2	23.8	23.4	23.0	22.6	22.2	21.8	21.4	21.0	20.6	20.2
	5	22.9	22.5	22.1	21.7	21.3	20.9	20.5	20.0	19.6	19.2	18.8	18.4	18.0

Table A9
Normative data for the ROCF copy 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	–	–	–	–	–	–	36.0	36.0	36.0	35.4	34.9	34.4	33.8
	90	–	–	–	–	–	36.0	35.9	35.3	34.8	34.3	33.7	33.2	32.7
	85	–	–	–	–	36.0	35.6	35.1	34.6	34.0	33.5	33.0	32.4	31.9
	80	–	–	36.0	36.0	35.5	35.0	34.5	33.9	33.4	32.9	32.3	31.8	31.3
	70	36.0	36.0	35.6	35.0	34.5	34.0	33.4	32.9	32.4	31.8	31.3	30.8	30.2
	60	35.8	35.2	34.7	34.2	33.6	33.1	32.6	32.0	31.5	31.0	30.4	29.9	29.4
	50	35.0	34.4	33.9	33.4	32.8	32.3	31.8	31.2	30.7	30.2	29.6	29.1	28.6
	40	34.2	33.6	33.1	32.6	32.0	31.5	31.0	30.4	29.9	29.4	28.8	28.3	27.8
	30	33.3	32.8	32.2	31.7	31.2	30.6	30.1	29.6	29.0	28.5	28.0	27.4	26.9
	20	32.3	31.7	31.2	30.7	30.1	29.6	29.1	28.6	28.0	27.5	27.0	26.4	25.9
	15	31.6	31.1	30.6	30.0	29.5	29.0	28.4	27.9	27.4	26.8	26.3	25.8	25.3
	10	30.9	30.3	29.8	29.3	28.7	28.2	27.7	27.1	26.6	26.1	25.5	25.0	24.5
	5	29.7	29.2	28.6	28.1	27.6	27.1	26.5	26.0	25.5	24.9	24.4	23.9	23.3
1 to 12 years of education	95	–	36.0	36.0	35.6	35.0	34.5	34.0	33.4	32.9	32.4	31.8	31.3	30.8
	90	36.0	35.5	35.0	34.4	33.9	33.4	32.8	32.3	31.8	31.2	30.7	30.2	29.6
	85	35.2	34.7	34.2	33.7	33.1	32.6	32.1	31.5	31.0	30.5	29.9	29.4	28.9
	80	34.6	34.1	33.5	33.0	32.5	31.9	31.4	30.9	30.4	29.8	29.3	28.8	28.2
	70	33.6	33.0	32.5	32.0	31.5	30.9	30.4	29.9	29.3	28.8	28.3	27.7	27.2
	60	32.7	32.2	31.7	31.1	30.6	30.1	29.5	29.0	28.5	27.9	27.4	26.9	26.3
	50	31.9	31.4	30.9	30.3	29.8	29.3	28.7	28.2	27.7	27.1	26.6	26.1	25.5
	40	31.1	30.6	30.1	29.5	29.0	28.5	27.9	27.4	26.9	26.3	25.8	25.3	24.7
	30	30.3	29.7	29.2	28.7	28.1	27.6	27.1	26.5	26.0	25.5	24.9	24.4	23.9
	20	29.2	28.7	28.2	27.6	27.1	26.6	26.0	25.5	25.0	24.4	23.9	23.4	22.8
	15	28.6	28.1	27.5	27.0	26.5	25.9	25.4	24.9	24.3	23.8	23.3	22.7	22.2
	10	27.8	27.3	26.8	26.2	25.7	25.2	24.6	24.1	23.6	23.0	22.5	22.0	21.4
	5	26.7	26.1	25.6	25.1	24.5	24.0	23.5	22.9	22.4	21.9	21.4	20.8	20.3

Table A10
Normative data for the ROCF copy 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	–	–	–	–	–	–	–	–	–	–	–	–	–
	90	–	–	–	–	–	–	–	–	–	–	–	–	36.0
	85	–	–	–	–	–	–	–	–	–	–	36.0	36.0	35.7
	80	–	–	–	–	–	–	–	36.0	36.0	36.0	35.8	35.4	35.0
	70	–	–	–	–	–	36.0	36.0	35.9	35.5	35.1	34.7	34.3	33.9
	60	–	–	–	36.0	36.0	35.8	35.4	35.0	34.6	34.2	33.8	33.4	33.0
	50	–	–	36.0	35.8	35.4	35.0	34.6	34.2	33.8	33.4	33.0	32.6	32.2
	40	36.0	36.0	35.3	34.9	34.5	34.1	33.7	33.4	33.0	32.6	32.2	31.8	31.4
	30	35.2	34.8	34.4	34.0	33.6	33.2	32.8	32.4	32.0	31.6	31.3	30.9	30.5
	20	34.2	33.8	33.4	33.0	32.6	32.2	31.8	31.4	31.0	30.6	30.2	29.8	29.4
	15	33.5	33.1	32.7	32.3	31.9	31.5	31.1	30.7	30.3	29.9	29.5	29.1	28.7
	10	32.7	32.3	31.9	31.5	31.1	30.7	30.3	29.9	29.5	29.1	28.7	28.3	27.9
	5	31.5	31.1	30.7	30.3	29.9	29.5	29.1	28.7	28.3	27.9	27.5	27.1	26.7
1 to 12 years of education	95	–	–	–	–	–	–	–	–	36.0	36.0	36.0	35.8	35.4
	90	–	–	–	–	–	–	36.0	36.0	35.8	35.4	35.0	34.6	34.2
	85	–	–	–	–	36.0	36.0	35.8	35.4	35.0	34.6	34.2	33.8	33.4
	80	–	–	36.0	36.0	35.9	35.5	35.1	34.7	34.3	33.9	33.5	33.1	32.7
	70	36.0	36.0	35.6	35.3	34.9	34.5	34.1	33.7	33.3	32.9	32.5	32.1	31.7
	60	35.5	35.1	34.7	34.3	33.9	33.6	33.2	32.8	32.4	32.0	31.6	31.2	30.8
	50	34.7	34.3	33.9	33.5	33.1	32.7	32.3	31.9	31.5	31.1	30.7	30.3	29.9
	40	33.9	33.5	33.1	32.7	32.3	31.9	31.5	31.1	30.7	30.3	29.9	29.5	29.1
	30	33.0	32.6	32.2	31.8	31.4	31.0	30.6	30.2	29.8	29.4	29.0	28.6	28.2
	20	31.9	31.5	31.1	30.7	30.3	29.9	29.5	29.1	28.7	28.3	27.9	27.5	27.1
	15	31.2	30.8	30.4	30.0	29.6	29.2	28.8	28.4	28.0	27.6	27.2	26.8	26.4
	10	30.4	30.0	29.6	29.2	28.8	28.4	28.0	27.6	27.2	26.8	26.4	26.0	25.6
	5	29.2	28.8	28.4	28.0	27.6	27.2	26.8	26.4	26.0	25.6	25.2	24.8	24.4

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

		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	–	–	–	–	–	–	–	–	–	–	–	36.0	36.0
	90	–	–	–	–	–	–	–	–	–	–	36.0	35.9	35.2
	85	–	–	–	–	–	–	–	–	36.0	36.0	35.4	34.6	33.9
	80	–	–	–	–	–	–	36.0	36.0	35.8	35.0	34.3	33.6	32.8
	70	–	–	–	–	36.0	36.0	35.5	34.8	34.1	33.3	32.6	31.9	31.2
	60	–	–	36.0	36.0	35.6	34.8	34.1	33.4	32.7	31.9	31.2	30.5	29.7
	50	36.0	36.0	35.7	35.0	34.3	33.5	32.8	32.1	31.3	30.6	29.9	29.1	28.4
	40	35.9	35.1	34.4	33.7	32.9	32.2	31.5	30.7	30.0	29.3	28.6	27.8	27.1
	30	34.4	33.7	33.0	32.2	31.5	30.8	30.1	29.3	28.6	27.9	27.1	26.4	25.7
	20	32.7	32.0	31.3	30.6	29.8	29.1	28.4	27.6	26.9	26.2	25.4	24.7	24.0
	15	31.7	31.0	30.2	29.5	28.8	28.0	27.3	26.6	25.8	25.1	24.4	23.7	22.9
	10	30.4	29.7	29.0	28.2	27.5	26.8	26.0	25.3	24.6	23.9	23.1	22.4	21.7
	5	28.5	27.8	27.1	26.3	25.6	24.9	24.1	23.4	22.7	22.0	21.2	20.5	19.8
1 to 12 years of education	95	–	–	–	–	–	–	–	–	–	36.0	36.0	35.9	35.2
	90	–	–	–	–	–	–	–	36.0	36.0	35.4	34.7	34.0	33.3
	85	–	–	–	–	–	–	36.0	35.6	34.9	34.2	33.5	32.7	32.0
	80	–	–	–	36.0	36.0	36.0	35.3	34.6	33.9	33.1	32.4	31.7	30.9
	70	–	–	36.0	35.8	35.1	34.4	33.6	32.9	32.2	31.4	30.7	30.0	29.2
	60	36.0	36.0	35.1	34.4	33.7	32.9	32.2	31.5	30.7	30.0	29.3	28.6	27.8
	50	35.3	34.5	33.8	33.1	32.3	31.6	30.9	30.2	29.4	28.7	28.0	27.2	26.5
	40	33.9	33.2	32.5	31.8	31.0	30.3	29.6	28.8	28.1	27.4	26.6	25.9	25.2
	30	32.5	31.8	31.1	30.3	29.6	28.9	28.1	27.4	26.7	26.0	25.2	24.5	23.8
	20	30.8	30.1	29.4	28.6	27.9	27.2	26.5	25.7	25.0	24.3	23.5	22.8	22.1
	15	29.8	29.1	28.3	27.6	26.9	26.1	25.4	24.7	23.9	23.2	22.5	21.7	21.0
	10	28.5	27.8	27.1	26.3	25.6	24.9	24.1	23.4	22.7	21.9	21.2	20.5	19.8
	5	26.6	25.9	25.2	24.4	23.7	23.0	22.2	21.5	20.8	20.0	19.3	18.6	17.9

Table A12
Normative data for the ROCF immediate recall 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	–	–	36.0	36.0	36.0	35.2	34.4	33.6	32.8	32.0	31.2	30.4	29.6
	90	36.0	36.0	35.2	34.4	33.6	32.8	32.0	31.3	30.5	29.7	28.9	28.1	27.3
	85	35.2	34.4	33.7	32.9	32.1	31.3	30.5	29.7	28.9	28.1	27.3	26.5	25.7
	80	33.9	33.1	32.3	31.6	30.8	30.0	29.2	28.4	27.6	26.8	26.0	25.2	24.4
	70	31.8	31.1	30.3	29.5	28.7	27.9	27.1	26.3	25.5	24.7	23.9	23.1	22.3
	60	30.1	29.3	28.5	27.7	26.9	26.1	25.3	24.5	23.7	23.0	22.2	21.4	20.6
	50	28.5	27.7	26.9	26.1	25.3	24.5	23.7	22.9	22.1	21.3	20.5	19.7	18.9
	40	26.8	26.0	25.2	24.4	23.6	22.9	22.1	21.3	20.5	19.7	18.9	18.1	17.3
	30	25.1	24.3	23.5	22.7	21.9	21.1	20.3	19.5	18.7	17.9	17.1	16.3	15.5
	20	23.0	22.2	21.4	20.6	19.8	19.0	18.2	17.4	16.6	15.8	15.0	14.3	13.5
	15	21.7	20.9	20.1	19.3	18.5	17.7	16.9	16.1	15.3	14.5	13.7	12.9	12.2
	10	20.1	19.3	18.5	17.7	16.9	16.1	15.3	14.6	13.8	13.0	12.2	11.4	10.6
	5	17.7	17.0	16.2	15.4	14.6	13.8	13.0	12.2	11.4	10.6	9.8	9.0	8.2
1 to 12 years of education	95	35.5	34.7	33.9	33.1	32.3	31.5	30.7	29.9	29.1	28.3	27.5	26.8	26.0
	90	33.1	32.3	31.5	30.7	29.9	29.2	28.4	27.6	26.8	26.0	25.2	24.4	23.6
	85	31.6	30.8	30.0	29.2	28.4	27.6	26.8	26.0	25.2	24.4	23.6	22.8	22.0
	80	30.2	29.5	28.7	27.9	27.1	26.3	25.5	24.7	23.9	23.1	22.3	21.5	20.7
	70	28.2	27.4	26.6	25.8	25.0	24.2	23.4	22.6	21.8	21.0	20.2	19.4	18.7
	60	26.4	25.6	24.8	24.0	23.2	22.4	21.6	20.9	20.1	19.3	18.5	17.7	16.9
	50	24.8	24.0	23.2	22.4	21.6	20.8	20.0	19.2	18.4	17.6	16.8	16.0	15.3
	40	23.1	22.3	21.5	20.8	20.0	19.2	18.4	17.6	16.8	16.0	15.2	14.4	13.6
	30	21.4	20.6	19.8	19.0	18.2	17.4	16.6	15.8	15.0	14.2	13.4	12.7	11.9
	20	19.3	18.5	17.7	16.9	16.1	15.3	14.5	13.7	12.9	12.2	11.4	10.6	9.8
	15	18.0	17.2	16.4	15.6	14.8	14.0	13.2	12.4	11.6	10.8	10.1	9.3	8.5
	10	16.4	15.6	14.8	14.0	13.2	12.5	11.7	10.9	10.1	9.3	8.5	7.7	6.9
	5	14.1	13.3	12.5	11.7	10.9	10.1	9.3	8.5	7.7	6.9	6.1	5.3	4.6

Table A13
Normative data for the ROCF immediate recall 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	35.4	34.5	33.7	32.9	32.0	31.2	30.3	29.5	28.6	27.8	26.9	26.1	25.2
	90	32.9	32.0	31.2	30.3	29.5	28.6	27.8	26.9	26.1	25.2	24.4	23.5	22.7
	85	31.2	30.3	29.5	28.6	27.8	26.9	26.1	25.2	24.4	23.5	22.7	21.9	21.0
	80	29.8	28.9	28.1	27.2	26.4	25.5	24.7	23.8	23.0	22.1	21.3	20.4	19.6
	70	27.5	26.7	25.8	25.0	24.1	23.3	22.4	21.6	20.7	19.9	19.0	18.2	17.3
	60	25.6	24.8	23.9	23.1	22.2	21.4	20.5	19.7	18.8	18.0	17.1	16.3	15.4
	50	23.8	23.0	22.2	21.3	20.5	19.6	18.8	17.9	17.1	16.2	15.4	14.5	13.7
	40	22.1	21.2	20.4	19.5	18.7	17.8	17.0	16.2	15.3	14.5	13.6	12.8	11.9
	30	20.2	19.3	18.5	17.6	16.8	15.9	15.1	14.3	13.4	12.6	11.7	10.9	10.0
	20	17.9	17.1	16.2	15.4	14.5	13.7	12.8	12.0	11.2	10.3	9.5	8.6	7.8
	15	16.5	15.7	14.8	14.0	13.1	12.3	11.4	10.6	9.7	8.9	8.0	7.2	6.4
	10	14.8	14.0	13.1	12.3	11.4	10.6	9.7	8.9	8.1	7.2	6.4	5.5	4.7
	5	12.3	11.4	10.6	9.8	8.9	8.1	7.2	6.4	5.5	4.7	3.8	3.0	2.1
1 to 12 years of education	95	31.7	30.8	30.0	29.1	28.3	27.4	26.6	25.7	24.9	24.0	23.2	22.3	21.5
	90	29.1	28.3	27.4	26.6	25.7	24.9	24.0	23.2	22.3	21.5	20.6	19.8	19.0
	85	27.4	26.6	25.7	24.9	24.0	23.2	22.3	21.5	20.6	19.8	19.0	18.1	17.3
	80	26.0	25.2	24.3	23.5	22.6	21.8	20.9	20.1	19.2	18.4	17.5	16.7	15.9
	70	23.8	22.9	22.1	21.2	20.4	19.5	18.7	17.8	17.0	16.1	15.3	14.4	13.6
	60	21.9	21.0	20.2	19.3	18.5	17.6	16.8	15.9	15.1	14.2	13.4	12.5	11.7
	50	20.1	19.3	18.4	17.6	16.7	15.9	15.0	14.2	13.3	12.5	11.6	10.8	9.9
	40	18.3	17.5	16.6	15.8	15.0	14.1	13.3	12.4	11.6	10.7	9.9	9.0	8.2
	30	16.4	15.6	14.7	13.9	13.0	12.2	11.4	10.5	9.7	8.8	8.0	7.1	6.3
	20	14.2	13.3	12.5	11.6	10.8	9.9	9.1	8.3	7.4	6.6	5.7	4.9	4.0
	15	12.8	11.9	11.1	10.2	9.4	8.5	7.7	6.8	6.0	5.2	4.3	3.5	2.6
	10	11.1	10.2	9.4	8.5	7.7	6.8	6.0	5.2	4.3	3.5	2.6	1.8	0.9
	5	8.5	7.7	6.9	6.0	5.2	4.3	3.5	2.6	1.8	0.9	0.1	–	–

Table A14
Normative data for the ROCF immediate recall stratified by age and education levels for CHILE

		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	35.2	34.3	33.4	32.5	31.7	30.8	29.9	29.0	28.2	27.3	26.4	25.5	24.7
	90	32.5	31.6	30.8	29.9	29.0	28.1	27.2	26.4	25.5	24.6	23.7	22.9	22.0
	85	30.7	29.9	29.0	28.1	27.2	26.3	25.5	24.6	23.7	22.8	22.0	21.1	20.2
	80	29.3	28.4	27.5	26.6	25.7	24.9	24.0	23.1	22.2	21.4	20.5	19.6	18.7
	70	26.9	26.0	25.1	24.3	23.4	22.5	21.6	20.7	19.9	19.0	18.1	17.2	16.4
	60	24.9	24.0	23.1	22.3	21.4	20.5	19.6	18.7	17.9	17.0	16.1	15.2	14.4
	50	23.0	22.2	21.3	20.4	19.5	18.6	17.8	16.9	16.0	15.1	14.3	13.4	12.5
	40	21.2	20.3	19.4	18.6	17.7	16.8	15.9	15.0	14.2	13.3	12.4	11.5	10.7
	30	19.2	18.3	17.4	16.6	15.7	14.8	13.9	13.0	12.2	11.3	10.4	9.5	8.7
	20	16.8	15.9	15.1	14.2	13.3	12.4	11.5	10.7	9.8	8.9	8.0	7.2	6.3
	15	15.3	14.5	13.6	12.7	11.8	10.9	10.1	9.2	8.3	7.4	6.6	5.7	4.8
	10	13.6	12.7	11.8	10.9	10.0	9.2	8.3	7.4	6.5	5.7	4.8	3.9	3.0
	5	10.9	10.0	9.1	8.3	7.4	6.5	5.6	4.7	3.9	3.0	2.1	1.2	0.4
1 to 12 years of education	95	32.2	31.3	30.4	29.5	28.7	27.8	26.9	26.0	25.2	24.3	23.4	22.5	21.6
	90	29.5	28.6	27.7	26.9	26.0	25.1	24.2	23.4	22.5	21.6	20.7	19.9	19.0
	85	27.7	26.8	26.0	25.1	24.2	23.3	22.5	21.6	20.7	19.8	19.0	18.1	17.2
	80	26.2	25.4	24.5	23.6	22.7	21.9	21.0	20.1	19.2	18.3	17.5	16.6	15.7
	70	23.9	23.0	22.1	21.2	20.4	19.5	18.6	17.7	16.9	16.0	15.1	14.2	13.3
	60	21.9	21.0	20.1	19.2	18.4	17.5	16.6	15.7	14.9	14.0	13.1	12.2	11.3
	50	20.0	19.1	18.3	17.4	16.5	15.6	14.8	13.9	13.0	12.1	11.3	10.4	9.5
	40	18.2	17.3	16.4	15.5	14.7	13.8	12.9	12.0	11.2	10.3	9.4	8.5	7.6
	30	16.2	15.3	14.4	13.5	12.7	11.8	10.9	10.0	9.2	8.3	7.4	6.5	5.6
	20	13.8	12.9	12.0	11.2	10.3	9.4	8.5	7.7	6.8	5.9	5.0	4.2	3.3
	15	12.3	11.4	10.6	9.7	8.8	7.9	7.1	6.2	5.3	4.4	3.6	2.7	1.8
	10	10.5	9.7	8.8	7.9	7.0	6.2	5.3	4.4	3.5	2.7	1.8	0.9	–
	5	7.9	7.0	6.1	5.2	4.4	3.5	2.6	1.7	0.9	–	–	–	–

Table A15
Normative data for the ROCF immediate recall stratified by age and education levels for CUBA

		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	–	–	–	–	36.0	36.0	36.0	35.0	33.9	32.9	31.8	30.8	29.8
	90	–	–	36.0	36.0	35.1	34.1	33.1	32.0	31.0	29.9	28.9	27.8	26.8
	85	36.0	36.0	35.3	34.2	33.2	32.1	31.1	30.1	29.0	28.0	26.9	25.9	24.8
	80	35.7	34.7	33.6	32.6	31.5	30.5	29.5	28.4	27.4	26.3	25.3	24.2	23.2
	70	33.1	32.0	31.0	30.0	28.9	27.9	26.8	25.8	24.7	23.7	22.7	21.6	20.6
	60	30.9	29.8	28.8	27.7	26.7	25.7	24.6	23.6	22.5	21.5	20.4	19.4	18.4
	50	28.8	27.8	26.7	25.7	24.7	23.6	22.6	21.5	20.5	19.4	18.4	17.4	16.3
	40	26.8	25.7	24.7	23.6	22.6	21.6	20.5	19.5	18.4	17.4	16.3	15.3	14.3
	30	24.6	23.5	22.5	21.4	20.4	19.3	18.3	17.3	16.2	15.2	14.1	13.1	12.1
	20	21.9	20.9	19.8	18.8	17.8	16.7	15.7	14.6	13.6	12.6	11.5	10.5	9.4
	15	20.3	19.3	18.2	17.2	16.1	15.1	14.0	13.0	12.0	10.9	9.9	8.8	7.8
	10	18.3	17.3	16.2	15.2	14.2	13.1	12.1	11.0	10.0	8.9	7.9	6.9	5.8
	5	15.4	14.3	13.3	12.2	11.2	10.2	9.1	8.1	7.0	6.0	5.0	3.9	2.9
1 to 12 years of education	95	–	–	36.0	36.0	35.1	34.0	33.0	31.9	30.9	29.9	28.8	27.8	26.7
	90	36.0	36.0	34.2	33.2	32.1	31.1	30.0	29.0	27.9	26.9	25.9	24.8	23.8
	85	34.3	33.3	32.2	31.2	30.2	29.1	28.1	27.0	26.0	24.9	23.9	22.9	21.8
	80	32.7	31.6	30.6	29.6	28.5	27.5	26.4	25.4	24.3	23.3	22.3	21.2	20.2
	70	30.1	29.0	28.0	26.9	25.9	24.8	23.8	22.8	21.7	20.7	19.6	18.6	17.6
	60	27.8	26.8	25.8	24.7	23.7	22.6	21.6	20.5	19.5	18.5	17.4	16.4	15.3
	50	25.8	24.8	23.7	22.7	21.6	20.6	19.5	18.5	17.5	16.4	15.4	14.3	13.3
	40	23.7	22.7	21.7	20.6	19.6	18.5	17.5	16.4	15.4	14.4	13.3	12.3	11.2
	30	21.5	20.5	19.4	18.4	17.4	16.3	15.3	14.2	13.2	12.2	11.1	10.1	9.0
	20	18.9	17.9	16.8	15.8	14.7	13.7	12.7	11.6	10.6	9.5	8.5	7.4	6.4
	15	17.3	16.2	15.2	14.1	13.1	12.1	11.0	10.0	8.9	7.9	6.8	5.8	4.8
	10	15.3	14.3	13.2	12.2	11.1	10.1	9.0	8.0	7.0	5.9	4.9	3.8	2.8
	5	12.3	11.3	10.3	9.2	8.2	7.1	6.1	5.1	4.0	3.0	1.9	0.9	–

Table A16
Normative data for the ROCF immediate recall 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	36.0	36.0	36.0	35.2	34.2	33.3	32.4	31.4	30.5	29.5	28.6	27.7	26.7
	90	35.7	34.8	33.8	32.9	32.0	31.0	30.1	29.1	28.2	27.3	26.3	25.4	24.4
	85	34.2	33.3	32.3	31.4	30.4	29.5	28.6	27.6	26.7	25.7	24.8	23.9	22.9
	80	32.9	32.0	31.1	30.1	29.2	28.2	27.3	26.4	25.4	24.5	23.5	22.6	21.7
	70	30.9	30.0	29.0	28.1	27.2	26.2	25.3	24.3	23.4	22.4	21.5	20.6	19.6
	60	29.2	28.3	27.3	26.4	25.4	24.5	23.6	22.6	21.7	20.7	19.8	18.9	17.9
	50	27.6	26.7	25.7	24.8	23.9	22.9	22.0	21.0	20.1	19.2	18.2	17.3	16.3
	40	26.0	25.1	24.2	23.2	22.3	21.3	20.4	19.5	18.5	17.6	16.6	15.7	14.8
	30	24.3	23.4	22.5	21.5	20.6	19.6	18.7	17.8	16.8	15.9	14.9	14.0	13.1
	20	22.3	21.4	20.4	19.5	18.6	17.6	16.7	15.7	14.8	13.9	12.9	12.0	11.0
	15	21.1	20.1	19.2	18.2	17.3	16.3	15.4	14.5	13.5	12.6	11.6	10.7	9.8
	10	19.5	18.6	17.7	16.7	15.8	14.8	13.9	12.9	12.0	11.1	10.1	9.2	8.2
	5	17.3	16.3	15.4	14.4	13.5	12.6	11.6	10.7	9.7	8.8	7.9	6.9	6.0
1 to 12 years of education	95	30.0	29.1	28.1	27.2	26.2	25.3	24.3	23.4	22.5	21.5	20.6	19.6	18.7
	90	27.7	26.8	25.8	24.9	24.0	23.0	22.1	21.1	20.2	19.3	18.3	17.4	16.4
	85	26.2	25.3	24.3	23.4	22.4	21.5	20.6	19.6	18.7	17.7	16.8	15.9	14.9
	80	24.9	24.0	23.1	22.1	21.2	20.2	19.3	18.3	17.4	16.5	15.5	14.6	13.6
	70	22.9	22.0	21.0	20.1	19.1	18.2	17.3	16.3	15.4	14.4	13.5	12.6	11.6
	60	21.2	20.3	19.3	18.4	17.4	16.5	15.6	14.6	13.7	12.7	11.8	10.9	9.9
	50	19.6	18.7	17.7	16.8	15.9	14.9	14.0	13.0	12.1	11.2	10.2	9.3	8.3
	40	18.0	17.1	16.2	15.2	14.3	13.3	12.4	11.5	10.5	9.6	8.6	7.7	6.8
	30	16.3	15.4	14.5	13.5	12.6	11.6	10.7	9.8	8.8	7.9	6.9	6.0	5.0
	20	14.3	13.4	12.4	11.5	10.5	9.6	8.7	7.7	6.8	5.8	4.9	4.0	3.0
	15	13.0	12.1	11.2	10.2	9.3	8.3	7.4	6.5	5.5	4.6	3.6	2.7	1.8
	10	11.5	10.6	9.6	8.7	7.8	6.8	5.9	4.9	4.0	3.1	2.1	1.2	0.2
	5	9.3	8.3	7.4	6.4	5.5	4.5	3.6	2.7	1.7	0.8	–	–	–

Table A17
Normative data for the ROCF immediate recall stratified by age and 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	34.8	34.0	33.3	32.5	31.7	30.9	30.2	29.4	28.6	27.8	27.1	26.3	25.5
	90	32.5	31.7	30.9	30.1	29.4	28.6	27.8	27.0	26.3	25.5	24.7	23.9	23.2
	85	30.9	30.1	29.3	28.6	27.8	27.0	26.2	25.5	24.7	23.9	23.1	22.4	21.6
	80	29.6	28.8	28.0	27.3	26.5	25.7	24.9	24.2	23.4	22.6	21.8	21.1	20.3
	70	27.5	26.7	25.9	25.2	24.4	23.6	22.8	22.1	21.3	20.5	19.7	19.0	18.2
	60	25.7	24.9	24.2	23.4	22.6	21.8	21.1	20.3	19.5	18.7	18.0	17.2	16.4
	50	24.1	23.3	22.5	21.8	21.0	20.2	19.4	18.7	17.9	17.1	16.3	15.6	14.8
	40	22.4	21.7	20.9	20.1	19.3	18.6	17.8	17.0	16.2	15.5	14.7	13.9	13.1
	30	20.7	19.9	19.1	18.4	17.6	16.8	16.0	15.2	14.5	13.7	12.9	12.1	11.4
	20	18.6	17.8	17.0	16.3	15.5	14.7	13.9	13.2	12.4	11.6	10.8	10.1	9.3
	15	17.3	16.5	15.7	14.9	14.2	13.4	12.6	11.8	11.1	10.3	9.5	8.7	8.0
	10	15.7	14.9	14.2	13.4	12.6	11.8	11.0	10.3	9.5	8.7	7.9	7.2	6.4
	5	13.3	12.6	11.8	11.0	10.2	9.5	8.7	7.9	7.1	6.4	5.6	4.8	4.0
1 to 12 years of education	95	31.1	30.4	29.6	28.8	28.0	27.3	26.5	25.7	24.9	24.2	23.4	22.6	21.8
	90	28.8	28.0	27.2	26.4	25.7	24.9	24.1	23.3	22.6	21.8	21.0	20.2	19.5
	85	27.2	26.4	25.7	24.9	24.1	23.3	22.6	21.8	21.0	20.2	19.4	18.7	17.9
	80	25.9	25.1	24.3	23.6	22.8	22.0	21.2	20.5	19.7	18.9	18.1	17.4	16.6
	70	23.8	23.0	22.2	21.5	20.7	19.9	19.1	18.4	17.6	16.8	16.0	15.3	14.5
	60	22.0	21.3	20.5	19.7	18.9	18.2	17.4	16.6	15.8	15.1	14.3	13.5	12.7
	50	20.4	19.6	18.8	18.1	17.3	16.5	15.7	15.0	14.2	13.4	12.6	11.9	11.1
	40	18.8	18.0	17.2	16.4	15.7	14.9	14.1	13.3	12.6	11.8	11.0	10.2	9.5
	30	17.0	16.2	15.4	14.7	13.9	13.1	12.3	11.6	10.8	10.0	9.2	8.5	7.7
	20	14.9	14.1	13.3	12.6	11.8	11.0	10.2	9.5	8.7	7.9	7.1	6.4	5.6
	15	13.6	12.8	12.0	11.3	10.5	9.7	8.9	8.2	7.4	6.6	5.8	5.1	4.3
	10	12.0	11.2	10.5	9.7	8.9	8.1	7.4	6.6	5.8	5.0	4.3	3.5	2.7
	5	9.7	8.9	8.1	7.3	6.6	5.8	5.0	4.2	3.5	2.7	1.9	1.1	0.4

Table A18
Normative data for the ROCF immediate recall stratified by age and education levels and gender for HONDURAS: MALES only

		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	36.0	36.0	35.8	35.0	34.3	33.5	32.7	31.9	31.1	30.3	29.5	28.7	27.9
	90	35.1	34.3	33.5	32.7	31.9	31.1	30.3	29.5	28.7	27.9	27.1	26.3	25.5
	85	33.5	32.7	31.9	31.1	30.3	29.5	28.7	27.9	27.1	26.3	25.6	24.8	24.0
	80	32.2	31.4	30.6	29.8	29.0	28.2	27.4	26.6	25.8	25.0	24.2	23.4	22.6
	70	30.1	29.3	28.5	27.7	26.9	26.1	25.3	24.5	23.7	22.9	22.1	21.3	20.5
	60	28.3	27.5	26.7	25.9	25.1	24.3	23.5	22.7	22.0	21.2	20.4	19.6	18.8
	50	26.7	25.9	25.1	24.3	23.5	22.7	21.9	21.1	20.3	19.5	18.7	17.9	17.1
	40	25.0	24.2	23.4	22.6	21.8	21.0	20.3	19.5	18.7	17.9	17.1	16.3	15.5
	30	23.2	22.5	21.7	20.9	20.1	19.3	18.5	17.7	16.9	16.1	15.3	14.5	13.7
	20	21.1	20.4	19.6	18.8	18.0	17.2	16.4	15.6	14.8	14.0	13.2	12.4	11.6
	15	19.8	19.0	18.2	17.4	16.7	15.9	15.1	14.3	13.5	12.7	11.9	11.1	10.3
	10	18.3	17.5	16.7	15.9	15.1	14.3	13.5	12.7	11.9	11.1	10.3	9.5	8.7
	5	15.9	15.1	14.3	13.5	12.7	11.9	11.1	10.3	9.5	8.7	8.0	7.2	6.4
1 to 12 years of education	95	31.3	30.5	29.7	28.9	28.1	27.3	26.5	25.7	24.9	24.1	23.3	22.5	21.8
	90	28.9	28.1	27.3	26.5	25.7	24.9	24.2	23.4	22.6	21.8	21.0	20.2	19.4
	85	27.3	26.5	25.8	25.0	24.2	23.4	22.6	21.8	21.0	20.2	19.4	18.6	17.8
	80	26.0	25.2	24.4	23.6	22.9	22.1	21.3	20.5	19.7	18.9	18.1	17.3	16.5
	70	23.9	23.1	22.3	21.5	20.8	20.0	19.2	18.4	17.6	16.8	16.0	15.2	14.4
	60	22.2	21.4	20.6	19.8	19.0	18.2	17.4	16.6	15.8	15.0	14.2	13.4	12.6
	50	20.5	19.7	18.9	18.1	17.3	16.5	15.7	15.0	14.2	13.4	12.6	11.8	11.0
	40	18.9	18.1	17.3	16.5	15.7	14.9	14.1	13.3	12.5	11.7	10.9	10.1	9.3
	30	17.1	16.3	15.5	14.7	13.9	13.1	12.3	11.5	10.7	10.0	9.2	8.4	7.6
	20	15.0	14.2	13.4	12.6	11.8	11.0	10.2	9.4	8.6	7.8	7.1	6.3	5.5
	15	13.7	12.9	12.1	11.3	10.5	9.7	8.9	8.1	7.3	6.5	5.7	4.9	4.2
	10	12.1	11.3	10.5	9.7	8.9	8.1	7.3	6.5	5.8	5.0	4.2	3.4	2.6
	5	9.7	8.9	8.2	7.4	6.6	5.8	5.0	4.2	3.4	2.6	1.8	1.0	0.2

Table A19
Normative data for the ROCF immediate recall stratified by age education level, and gender for HONDURAS: FEMALES only

		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	33.4	32.6	31.8	31.0	30.2	29.4	28.6	27.8	27.0	26.2	25.4	24.6	23.9
	90	31.0	30.2	29.4	28.6	27.8	27.0	26.3	25.5	24.7	23.9	23.1	22.3	21.5
	85	29.4	28.6	27.9	27.1	26.3	25.5	24.7	23.9	23.1	22.3	21.5	20.7	19.9
	80	28.1	27.3	26.5	25.7	25.0	24.2	23.4	22.6	21.8	21.0	20.2	19.4	18.6
	70	26.0	25.2	24.4	23.6	22.9	22.1	21.3	20.5	19.7	18.9	18.1	17.3	16.5
	60	24.3	23.5	22.7	21.9	21.1	20.3	19.5	18.7	17.9	17.1	16.3	15.5	14.7
	50	22.6	21.8	21.0	20.2	19.4	18.6	17.8	17.1	16.3	15.5	14.7	13.9	13.1
	40	21.0	20.2	19.4	18.6	17.8	17.0	16.2	15.4	14.6	13.8	13.0	12.2	11.4
	30	19.2	18.4	17.6	16.8	16.0	15.2	14.4	13.6	12.8	12.1	11.3	10.5	9.7
	20	17.1	16.3	15.5	14.7	13.9	13.1	12.3	11.5	10.7	9.9	9.2	8.4	7.6
	15	15.8	15.0	14.2	13.4	12.6	11.8	11.0	10.2	9.4	8.6	7.8	7.0	6.3
	10	14.2	13.4	12.6	11.8	11.0	10.2	9.4	8.6	7.9	7.1	6.3	5.5	4.7
	5	11.8	11.0	10.3	9.5	8.7	7.9	7.1	6.3	5.5	4.7	3.9	3.1	2.3
1 to 12 years of education	95	27.2	26.4	25.6	24.9	24.1	23.3	22.5	21.7	20.9	20.1	19.3	18.5	17.7
	90	24.9	24.1	23.3	22.5	21.7	20.9	20.1	19.3	18.5	17.7	16.9	16.1	15.3
	85	23.3	22.5	21.7	20.9	20.1	19.3	18.5	17.7	16.9	16.1	15.4	14.6	13.8
	80	22.0	21.2	20.4	19.6	18.8	18.0	17.2	16.4	15.6	14.8	14.0	13.2	12.5
	70	19.9	19.1	18.3	17.5	16.7	15.9	15.1	14.3	13.5	12.7	11.9	11.1	10.4
	60	18.1	17.3	16.5	15.7	14.9	14.1	13.3	12.5	11.8	11.0	10.2	9.4	8.6
	50	16.5	15.7	14.9	14.1	13.3	12.5	11.7	10.9	10.1	9.3	8.5	7.7	6.9
	40	14.8	14.0	13.2	12.4	11.6	10.9	10.1	9.3	8.5	7.7	6.9	6.1	5.3
	30	13.0	12.3	11.5	10.7	9.9	9.1	8.3	7.5	6.7	5.9	5.1	4.3	3.5
	20	10.9	10.2	9.4	8.6	7.8	7.0	6.2	5.4	4.6	3.8	3.0	2.2	1.4
	15	9.6	8.8	8.0	7.3	6.5	5.7	4.9	4.1	3.3	2.5	1.7	0.9	–
	10	8.1	7.3	6.5	5.7	4.9	4.1	3.3	2.5	1.7	0.9	–	–	–
	5	5.7	4.9	4.1	3.3	2.5	1.7	0.9	–	–	–	–	–	–

Table A20
Normative data for the ROCF immediate recall 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	36.0	36.0	34.7	33.9	33.1	32.3	31.5	30.8	30.0	29.2	28.4	27.6	26.9
	90	33.8	33.0	32.2	31.4	30.7	29.9	29.1	28.3	27.5	26.8	26.0	25.2	24.4
	85	32.2	31.4	30.6	29.8	29.0	28.3	27.5	26.7	25.9	25.1	24.4	23.6	22.8
	80	30.8	30.0	29.3	28.5	27.7	26.9	26.1	25.4	24.6	23.8	23.0	22.2	21.5
	70	28.7	27.9	27.1	26.3	25.5	24.8	24.0	23.2	22.4	21.6	20.9	20.1	19.3
	60	26.8	26.1	25.3	24.5	23.7	22.9	22.2	21.4	20.6	19.8	19.0	18.3	17.5
	50	25.1	24.4	23.6	22.8	22.0	21.2	20.5	19.7	18.9	18.1	17.3	16.6	15.8
	40	23.5	22.7	21.9	21.1	20.3	19.6	18.8	18.0	17.2	16.4	15.7	14.9	14.1
	30	21.6	20.9	20.1	19.3	18.5	17.7	17.0	16.2	15.4	14.6	13.8	13.1	12.3
	20	19.5	18.7	17.9	17.1	16.4	15.6	14.8	14.0	13.2	12.5	11.7	10.9	10.1
	15	18.1	17.3	16.6	15.8	15.0	14.2	13.4	12.7	11.9	11.1	10.3	9.6	8.8
	10	16.5	15.7	14.9	14.2	13.4	12.6	11.8	11.0	10.3	9.5	8.7	7.9	7.2
	5	14.1	13.3	12.5	11.7	11.0	10.2	9.4	8.6	7.8	7.1	6.3	5.5	4.7
1 to 12 years of education	95	33.1	32.3	31.5	30.8	30.0	29.2	28.4	27.6	26.9	26.1	25.3	24.5	23.7
	90	30.7	29.9	29.1	28.3	27.5	26.8	26.0	25.2	24.4	23.7	22.9	22.1	21.3
	85	29.0	28.3	27.5	26.7	25.9	25.2	24.4	23.6	22.8	22.0	21.3	20.5	19.7
	80	27.7	26.9	26.1	25.4	24.6	23.8	23.0	22.2	21.5	20.7	19.9	19.1	18.3
	70	25.5	24.8	24.0	23.2	22.4	21.6	20.9	20.1	19.3	18.5	17.7	17.0	16.2
	60	23.7	22.9	22.2	21.4	20.6	19.8	19.0	18.3	17.5	16.7	15.9	15.1	14.4
	50	22.0	21.2	20.5	19.7	18.9	18.1	17.4	16.6	15.8	15.0	14.2	13.5	12.7
	40	20.3	19.6	18.8	18.0	17.2	16.4	15.7	14.9	14.1	13.3	12.5	11.8	11.0
	30	18.5	17.7	17.0	16.2	15.4	14.6	13.8	13.1	12.3	11.5	10.7	9.9	9.2
	20	16.4	15.6	14.8	14.0	13.2	12.5	11.7	10.9	10.1	9.3	8.6	7.8	7.0
	15	15.0	14.2	13.4	12.7	11.9	11.1	10.3	9.6	8.8	8.0	7.2	6.4	5.7
	10	13.4	12.6	11.8	11.0	10.3	9.5	8.7	7.9	7.2	6.4	5.6	4.8	4.0
	5	11.0	10.2	9.4	8.6	7.8	7.1	6.3	5.5	4.7	3.9	3.2	2.4	1.6

Table A21
Normative data for the ROCF immediate recall 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	30.1	29.6	29.1	28.6	28.1	27.5	27.0	26.5	26.0	25.5	24.9	24.4	23.9
	90	28.6	28.1	27.5	27.0	26.5	26.0	25.4	24.9	24.4	23.9	23.4	22.8	22.3
	85	27.5	27.0	26.5	26.0	25.4	24.9	24.4	23.9	23.4	22.8	22.3	21.8	21.3
	80	26.6	26.1	25.6	25.1	24.6	24.0	23.5	23.0	22.5	22.0	21.4	20.9	20.4
	70	25.2	24.7	24.2	23.7	23.2	22.6	22.1	21.6	21.1	20.6	20.0	19.5	19.0
	60	24.1	23.5	23.0	22.5	22.0	21.5	20.9	20.4	19.9	19.4	18.9	18.3	17.8
	50	23.0	22.4	21.9	21.4	20.9	20.4	19.8	19.3	18.8	18.3	17.8	17.2	16.7
	40	21.9	21.4	20.8	20.3	19.8	19.3	18.8	18.2	17.7	17.2	16.7	16.2	15.6
	30	20.7	20.2	19.7	19.1	18.6	18.1	17.6	17.1	16.5	16.0	15.5	15.0	14.4
	20	19.3	18.8	18.3	17.7	17.2	16.7	16.2	15.7	15.1	14.6	14.1	13.6	13.0
	15	18.4	17.9	17.4	16.9	16.3	15.8	15.3	14.8	14.3	13.7	13.2	12.7	12.2
	10	17.4	16.8	16.3	15.8	15.3	14.8	14.2	13.7	13.2	12.7	12.2	11.6	11.1
	5	15.8	15.3	14.8	14.2	13.7	13.2	12.7	12.1	11.6	11.1	10.6	10.1	9.5
1 to 12 years of education	95	26.6	26.1	25.5	25.0	24.5	24.0	23.5	22.9	22.4	21.9	21.4	20.9	20.3
	90	25.0	24.5	24.0	23.4	22.9	22.4	21.9	21.4	20.8	20.3	19.8	19.3	18.8
	85	24.0	23.4	22.9	22.4	21.9	21.4	20.8	20.3	19.8	19.3	18.7	18.2	17.7
	80	23.1	22.6	22.0	21.5	21.0	20.5	20.0	19.4	18.9	18.4	17.9	17.4	16.8
	70	21.7	21.2	20.6	20.1	19.6	19.1	18.6	18.0	17.5	17.0	16.5	16.0	15.4
	60	20.5	20.0	19.5	18.9	18.4	17.9	17.4	16.9	16.3	15.8	15.3	14.8	14.3
	50	19.4	18.9	18.4	17.8	17.3	16.8	16.3	15.8	15.2	14.7	14.2	13.7	13.2
	40	18.3	17.8	17.3	16.7	16.2	15.7	15.2	14.7	14.1	13.6	13.1	12.6	12.1
	30	17.1	16.6	16.1	15.6	15.0	14.5	14.0	13.5	13.0	12.4	11.9	11.4	10.9
	20	15.7	15.2	14.7	14.2	13.6	13.1	12.6	12.1	11.6	11.0	10.5	10.0	9.5
	15	14.8	14.3	13.8	13.3	12.8	12.2	11.7	11.2	10.7	10.2	9.6	9.1	8.6
	10	13.8	13.3	12.8	12.2	11.7	11.2	10.7	10.2	9.6	9.1	8.6	8.1	7.6
	5	12.2	11.7	11.2	10.7	10.1	9.6	9.1	8.6	8.1	7.5	7.0	6.5	6.0

Table A22
Normative data for the ROCF immediate recall 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	36.0	35.0	34.0	33.0	32.1	31.1	30.1	29.1	28.2	27.2	26.2	25.2	24.3
	90	33.8	32.8	31.8	30.8	29.9	28.9	27.9	26.9	25.9	25.0	24.0	23.0	22.0
	85	32.3	31.3	30.3	29.4	28.4	27.4	26.4	25.4	24.5	23.5	22.5	21.5	20.6
	80	31.1	30.1	29.1	28.1	27.1	26.2	25.2	24.2	23.2	22.3	21.3	20.3	19.3
	70	29.1	28.1	27.1	26.2	25.2	24.2	23.2	22.2	21.3	20.3	19.3	18.3	17.4
	60	27.4	26.4	25.5	24.5	23.5	22.5	21.6	20.6	19.6	18.6	17.7	16.7	15.7
	50	25.9	24.9	23.9	23.0	22.0	21.0	20.0	19.1	18.1	17.1	16.1	15.1	14.2
	40	24.4	23.4	22.4	21.4	20.4	19.5	18.5	17.5	16.5	15.6	14.6	13.6	12.6
	30	22.7	21.7	20.7	19.8	18.8	17.8	16.8	15.9	14.9	13.9	12.9	11.9	11.0
	20	20.7	19.7	18.8	17.8	16.8	15.8	14.9	13.9	12.9	11.9	11.0	10.0	9.0
	15	19.5	18.5	17.5	16.6	15.6	14.6	13.6	12.7	11.7	10.7	9.7	8.8	7.8
	10	18.0	17.0	16.1	15.1	14.1	13.1	12.2	11.2	10.2	9.2	8.3	7.3	6.3
	5	15.8	14.8	13.9	12.9	11.9	10.9	9.9	9.0	8.0	7.0	6.0	5.1	4.1
1 to 12 years of education	95	32.6	31.6	30.6	29.6	28.7	27.7	26.7	25.7	24.8	23.8	22.8	21.8	20.8
	90	30.4	29.4	28.4	27.4	26.4	25.5	24.5	23.5	22.5	21.6	20.6	19.6	18.6
	85	28.9	27.9	26.9	25.9	25.0	24.0	23.0	22.0	21.1	20.1	19.1	18.1	17.2
	80	27.6	26.7	25.7	24.7	23.7	22.8	21.8	20.8	19.8	18.9	17.9	16.9	15.9
	70	25.7	24.7	23.7	22.8	21.8	20.8	19.8	18.8	17.9	16.9	15.9	14.9	14.0
	60	24.0	23.0	22.1	21.1	20.1	19.1	18.2	17.2	16.2	15.2	14.3	13.3	12.3
	50	22.5	21.5	20.5	19.6	18.6	17.6	16.6	15.6	14.7	13.7	12.7	11.7	10.8
	40	20.9	20.0	19.0	18.0	17.0	16.1	15.1	14.1	13.1	12.2	11.2	10.2	9.2
	30	19.3	18.3	17.3	16.4	15.4	14.4	13.4	12.5	11.5	10.5	9.5	8.5	7.6
	20	17.3	16.3	15.4	14.4	13.4	12.4	11.5	10.5	9.5	8.5	7.6	6.6	5.6
	15	16.1	15.1	14.1	13.2	12.2	11.2	10.2	9.3	8.3	7.3	6.3	5.3	4.4
	10	14.6	13.6	12.7	11.7	10.7	9.7	8.8	7.8	6.8	5.8	4.8	3.9	2.9
	5	12.4	11.4	10.4	9.5	8.5	7.5	6.5	5.6	4.6	3.6	2.6	1.7	0.7

Table A23
Normative data for the ROCF immediate recall stratified by age and education levels for PUERTO RICO

		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	–	–	36.0	35.9	34.5	33.2	31.8	30.4	29.0	27.6	26.2	24.8	23.4
	90	–	36.0	34.9	33.5	32.1	30.7	29.3	27.9	26.5	25.1	23.7	22.3	20.9
	85	36.0	34.6	33.2	31.8	30.4	29.0	27.6	26.2	24.8	23.4	22.1	20.7	19.3
	80	34.6	33.2	31.8	30.4	29.0	27.6	26.2	24.9	23.5	22.1	20.7	19.3	17.9
	70	32.4	31.0	29.6	28.2	26.8	25.4	24.0	22.7	21.3	19.9	18.5	17.1	15.7
	60	30.5	29.2	27.8	26.4	25.0	23.6	22.2	20.8	19.4	18.0	16.6	15.2	13.8
	50	28.8	27.4	26.0	24.6	23.3	21.9	20.5	19.1	17.7	16.3	14.9	13.5	12.1
	40	27.1	25.7	24.3	22.9	21.5	20.1	18.7	17.3	16.0	14.6	13.2	11.8	10.4
	30	25.2	23.9	22.5	21.1	19.7	18.3	16.9	15.5	14.1	12.7	11.3	9.9	8.5
	20	23.0	21.6	20.3	18.9	17.5	16.1	14.7	13.3	11.9	10.5	9.1	7.7	6.3
	15	21.7	20.3	18.9	17.5	16.1	14.7	13.3	11.9	10.5	9.1	7.7	6.3	4.9
	10	20.0	18.6	17.2	15.8	14.4	13.0	11.6	10.3	8.9	7.5	6.1	4.7	3.3
	5	17.5	16.1	14.7	13.4	12.0	10.6	9.2	7.8	6.4	5.0	3.6	2.2	0.8
1 to 12 years of education	95	36.0	36.0	34.8	33.4	32.0	30.6	29.2	27.8	26.4	25.1	23.7	22.3	20.9
	90	35.1	33.7	32.3	30.9	29.5	28.2	26.8	25.4	24.0	22.6	21.2	19.8	18.4
	85	33.5	32.1	30.7	29.3	27.9	26.5	25.1	23.7	22.3	20.9	19.5	18.1	16.7
	80	32.1	30.7	29.3	27.9	26.5	25.1	23.7	22.3	20.9	19.5	18.2	16.8	15.4
	70	29.9	28.5	27.1	25.7	24.3	22.9	21.5	20.1	18.7	17.3	15.9	14.6	13.2
	60	28.0	26.6	25.2	23.8	22.5	21.1	19.7	18.3	16.9	15.5	14.1	12.7	11.3
	50	26.3	24.9	23.5	22.1	20.7	19.3	17.9	16.5	15.2	13.8	12.4	11.0	9.6
	40	24.6	23.2	21.8	20.4	19.0	17.6	16.2	14.8	13.4	12.0	10.6	9.3	7.9
	30	22.7	21.3	19.9	18.5	17.1	15.8	14.4	13.0	11.6	10.2	8.8	7.4	6.0
	20	20.5	19.1	17.7	16.3	14.9	13.6	12.2	10.8	9.4	8.0	6.6	5.2	3.8
	15	19.1	17.7	16.4	15.0	13.6	12.2	10.8	9.4	8.0	6.6	5.2	3.8	2.4
	10	17.5	16.1	14.7	13.3	11.9	10.5	9.1	7.7	6.3	4.9	3.6	2.2	0.8
	5	15.0	13.6	12.2	10.8	9.4	8.0	6.7	5.3	3.9	2.5	1.1	–	–