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Hopkins Verbal Learning Test–Revised: Normative data for the Latin American Spanish speaking adult population

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Abstract.
OBJECTIVE: To generate normative data on the Hopkins Verbal Learning Test–Revised (HVLT-R) 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 HVLT-R 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 17–45% of the variance in HVLT-R scores. Although *t*-tests showed significant differences between men and women in Guatemala on the HVLT-R, it was a small effect size. As a result, gender-adjusted norms were not generated.
CONCLUSIONS: The results from this study will have a substantial impact on the practice of neuropsychology in Latin America, as this is the first normative multicenter study to develop norms for the HVLT-R in this region.

Keywords: Normative data, Hopkins Verbal Learning Test–Revised, Latin America, verbal learning and memory

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1. Introduction

The Hopkins Verbal Learning Test-Revised (HVLT-R) is a brief assessment of verbal learning and memory that was developed by Brandt and Benedict (2001). It was designed to be similar in methodology to the Brief Visuospatial Memory Test-Revised (BVMT-R; Benedict, 1997) and was modeled after other word-list learning tasks (e.g., Rey Auditory Verbal Learning Test, California Verbal Learning Test). It is intended for use with a wide range of individuals, including those who are considered "difficult to test" and individuals who have moderate to severe cognitive impairments. The HLVT-R is identical to the original version of the measure (HVLT; Brandt, 1991) with two exceptions: the HLVT-R includes the addition of a delayed recall trial and as a result, the recognition trial no longer immediately follows the three learning trials.

There are six alternate forms of the HVLT-R. The administration contains three free recall learning trials consisting of 12 semantically categorized words, followed by a 20-minute delayed recall trial, concluding with a yes/no recognition trial. The yes/no recognition task has a total of 24 words, incorporating 12 words from the recall list, 6 words that are semantically related to the recall items but were not included in the initial trials, and 6 unrelated words. The HVLT-R yields several scores including a total recall (raw score) delayed recall (raw score), retention (%), a recognition discrimination index, as well as *t* scores for each of the above mentioned (Brandt & Benedict, 2001). The HVLT-R has been used in both populations with and without neurological problems and has established construct, concurrent and discriminant validity (e.g., Benedict, Schretlen, Groninger, & Brandt, 1998; Brandt, 1991; Rasmussan, Bylsma, & Brandt, 1995).

The HVLT-R was normed on healthy individuals from 16–92 years of age but has been deemed well suited for use with individuals who might be difficult to test or patients who have neurological impairments. The HVLT-R has been utilized in both clinical and research intervention studies. Results from the literature demonstrate support for use among people with traumatic brain injury (e.g., O'Neil-Pirozzi, Goldstein, Strangman, & Glenn, 2012), dementia (e.g., Gaines, Shapiro, Alt, & Benedict, 2006; McLaughlin, Chang, & Malloy, 2012), Alzheimer's (e.g., McLaughlin et al., 2012), and Huntington's disease (e.g., Solomon et al., 2007).

Previous research exploring variables related to neuropsychological test performance indicates that demographic variables are significantly related to both verbal and nonverbal cognitive test results (Pineda Rosselli, Ardila, Mejia, Romero, & Perez, 2000). While some mixed findings exist based on the demographic characteristics of the sample, research studies have generally supported the influence of age, education, gender, and ethnicity for the HVLT-R (e.g., Brandt & Benedict, 2001; Cherner et al., 2007; Friedman, Schinka, Mortimer, & Graves, 2002; Hester, Kinsella, Ong, & Turner, 2004; Vanderploeg, Schinka, Jones, Small, Graves, & Mortimer, 2000). Friedman et al. (2002) found that that age had a moderately large effect on HVLT-R performance with younger African American participants producing higher scores than older African American participants. Friedman and colleagues also found that education and gender were responsible for a statistically significant proportion of the variance in the performance of the HVLT-R, such that those with more than 12 years education and those who were female performed better across multiple HVLT-R measures. Among a sample of older adults ranging in age from 60–85 from the United States, Vanderploeg et al. (2000) found that age and gender impacted learning performance with younger participants and female participants scoring higher on the HVLT-R. Cherner et al. (2007) compared the published HLVT-R norms to a sample of healthy Spanish speaking individuals and found high rates of misclassification, particularly among participants with lower levels of education, arguing inadequate representation of individuals with very low education in the original normative sample.

The original HVLT-R normative sample was comprised of 1,179 individuals who did not have neurological or psychiatric disorders. The sample was almost 75% female participants (male $n = 300$) ranging in age from 15 to 92 years ($M = 59$ years, $SD = 18.6$). There was a vast range in education level, ranging from 2 to 20 years of education ($M = 13.4$, $SD = 2.9$). The authors concluded that age had the largest effect on scores (19% of the variance) but that level of education and gender did not significantly contribute to performance (Strauss, Sherman, & Spreen, 2006). The racial/ethnic breakdown of the standardization sample was not reported.

Though limited in terms of cultural diversity, there have been several studies that expanded upon the standardization sample. For example, Vanderploeg et al. (2000) provided both age- and gender-adjusted normative data from a sample of older adults (ages 60 to 84). In addition, Hester et al. (2004) provided age- and education-adjusted normative data for older

Australian adults (ages 60 to 89). Friedman et al. (2002) contributed age-, gender-, and education-adjusted normative data from a sample of older African-American participants. Finally, Cherner et al. (2007) applied published test norms for the HVLT-R to a sample of neurotypical Spanish speakers from the U.S.-Mexico border region. Results identified high rates of misclassification, proving the norms to be particularly inadequate with individuals who had lower levels of education (Cherner et al., 2007).

The HVLT-R is commonly used in neuropsychological evaluations to test verbal learning and memory, but to date, normative data do not exist for individuals from Latin America. There is a critical need for appropriately validated instruments and norms in order to provide the best quality of care, including diagnostic accuracy (Cherner et al., 2007). The utilization of norms based predominately on Caucasian samples puts individuals from culturally diverse backgrounds at risk of being misdiagnosed based on factors influenced by culture. In addition, there is a critical need to norm neuropsychological measures to be culturally and linguistically sensitive in order to provide high quality clinical services as well as relevant research among culturally diverse populations.

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. Five participants were excluded from the analyses, with a final sample of 3,972 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 list applied in the study was from HVLT-R form 5, which contains a list of 12 semantically related words in three categories (professions, sports, and vegetables). Three trials of successive learning are presented where a list is read to the participant and the correct answers of each learning trial performed are recorded. Total Recall is the sum of words recalled correctly in the three trials. After 20–25 minutes, the Delayed Recall phase occurs where the subject is asked to recall all the words from the initial list that they can remember (Benedict et al., 1998; Brandt, 1991).

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 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_e (residual) value provided by the regression model, residuals were

Table 1
Effect of gender in the HVLT-R total recall score

Country	Gender	Mean (SD)	*t*	df	Sig. (2-tailed)	*r*
Argentina	Male	24.9 (4.5)	1.21	318	0.227	0.068
	Female	24.2 (5.0)				
Bolivia[a]	Male	18.7 (5.8)	–0.43	172.7	0.669	0.033
	Female	19.0 (4.7)				
Chile	Male	20.2 (5.7)	–0.42	318	0.673	0.024
	Female	20.4 (6.1)				
Cuba	Male	20.8 (4.7)	0.25	304	0.804	0.014
	Female	20.7 (5.3)				
El Salvador	Male	17.7 (6.0)	–0.11	254	0.912	0.007
	Female	17.8 (5.5)				
Guatemala	Male	19.4 (5.2)	–3.61	211	<0.001***	0.241
	Female	21.9 (5.2)				
Honduras	Male	17.2 (5.5)	0.18	182	0.859	0.013
	Female	17.0 (4.7)				
Mexico	Male	20.8 (5.3)	1.16	1,298	0.245	0.032
	Female	20.4 (5.1)				
Paraguay[a]	Male	16.3 (5.6)	1.39	184.4	0.167	0.102
	Female	15.4 (4.8)				
Peru	Male	21.5 (5.1)	–1.00	243	0.320	0.064
	Female	22.1 (4.9)				
Puerto Rico	Male	21.5 (5.0)	–1.55	291	0.121	0.091
	Female	22.4 (5.1)				

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

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 HVLT-R total recall and delayed recall scores.

3. Results

3.1. HVLT-R total recall

Regarding the effect of gender on HVLT-R total recall scores, the *t*-tests showed significant differences between men and women from Guatemala, however, its effect size was less than 0.3. Table 1 shows the results of the gender analyses by country on HVLT-R total recall scores. As shown in Table 1, the effect sizes for all countries were less than 0.3, and therefore gender was not taken into account to generate HVLT-R total recall normative data for any of the countries in the study.

The final eleven HVLT-R total recall multivariate linear regression models for each country are shown in Table 2. In all countries, the HVLT-R total recall score increased for those with more than 12 years of education (see Table 2) and decreased in a linear fashion as a function of age. The amount of variance explained in HVLT-R total recall scores ranged from 17% (in Guatemala) to 40% (in Paraguay).

3.2. HVLT-R delayed recall

Regarding the effect of gender on HVLT-R delayed recall scores, the *t*-tests showed significant differences between men and women in Guatemala and Puerto Rico. Table 3 shows the results of the gender analysis by country on HVLT-R delayed recall scores. As shown in Table 3, the effect sizes for all countries were less than 0.3, and therefore gender was not taken into account to generate HVLT-R delayed recall normative data for any of the countries in the study.

The final eleven HVLT-R delayed recall multivariate linear regression models for each country are shown in Table 4. In all countries, the HVLT-R delayed recall score increased for those with more than 12 years of education in all countries except Bolivia (see Table 4), and decreased in a linear fashion as a function of age. The amount of variance explained in HVLT-R delayed recall scores ranged from 13% (in Guatemala) to 45% (in Paraguay).

3.3. Normative procedure

Norms (e.g., a percentile score) for the HVLT-R total and delayed recall score test were established using the

Table 2
Final multiple linear regression models for HVLT-R total recall score

Country		B	Std. Error	*t*	Sig.	R^2	SD_e (residual)
Argentina	(Constant)	26.116	0.710	36.762	<0.001	0.183	4.356
	Age	–0.070	0.013	–5.514	<0.001		
	Education	2.764	0.494	5.590	<0.001		
Bolivia	(Constant)	24.553	0.728	33.723	<0.001	0.323	4.213
	Age	–0.112	0.012	–9.527	<0.001		
	Education	3.264	0.679	4.811	<0.001		
Chile	(Constant)	26.596	0.883	30.136	<0.001	0.360	4.737
	Age	–0.132	0.014	–9.337	<0.001		
	Education	4.140	0.644	6.427	<0.001		
Cuba	(Constant)	26.197	0.725	36.149	<0.001	0.277	4.267
	Age	–0.115	0.012	–9.251	<0.001		
	Education	2.830	0.578	4.894	<0.001		
El Salvador	(Constant)	22.939	0.871	26.344	<0.001	0.331	4.660
	Age	–0.112	0.014	–7.877	<0.001		
	Education	5.287	0.719	7.358	<0.001		
Guatemala	(Constant)	24.516	1.119	21.913	<0.001	0.168	4.867
	Age	–0.092	0.019	–4.738	<0.001		
	Education	3.028	0.690	4.386	<0.001		
Honduras	(Constant)	21.076	0.928	22.712	<0.001	0.299	4.180
	Age	–0.100	0.017	–5.954	<0.001		
	Education	3.762	0.743	5.065	<0.001		
Mexico	(Constant)	25.924	0.358	72.508	<0.001	0.258	4.419
	Age	–0.112	0.006	–18.489	<0.001		
	Education	2.157	0.297	7.267	<0.001		
Paraguay	(Constant)	20.624	1.062	19.419	<0.001	0.396	3.985
	Age	–0.112	0.018	–6.087	<0.001		
	Education	5.685	0.705	8.062	<0.001		
Peru	(Constant)	24.749	0.827	29.934	<0.001	0.221	4.389
	Age	–0.095	0.014	–6.830	<0.001		
	Education	1.999	0.599	3.337	0.001		
Puerto Rico	(Constant)	29.183	0.804	36.298	<0.001	0.358	4.060
	Age	–0.152	0.013	–11.405	<0.001		
	Education	1.261	0.494	2.553	0.011		

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 Puerto Rican woman, who is 50 years old and has 8 years of education. She has a score of 15 on the HVLT-R total recall 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 (Puerto Rico) on this test and time point (HVLT-R total recall) 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 0.091, which is not greater than 0.3. For Puerto Ricans on this test, gender does not influence scores to a sufficient degree to take it into account gender when determining the percentile. b) Find Puerto Rico in Table 2, which provides the final regression models by country for HVLT-R total recall. Use the B weights to create an equation that will allow you to obtain the predicted HVLT-R total recall 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 HVLT-R total recall score would be calculated using the equation $[\hat{y}_i = 29.183 + (-0.152 \cdot Age_i) + (1.261 \cdot Dichotomized\ Educational\ Level_i)]$ (the values have been rounded for presentation in the formula). The subscript notation *i* indicate the person of interest. The person's age is 50, 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 8 years of education, her educational level value is 0. Thus the predicted value is $\hat{y}_i = 29.183 + (-0.152 \cdot 50) + (1.261 \cdot 0) = 29.183 + (-7.6) + 0 = 21.57)$. c) In order to calculate the residual value (indicated with an e in the equation), we subtract the actual value from

Table 3
Effect of gender in the HVLT-R delayed recall

Country	Gender	Mean (SD)	*t*	df	Sig. (2-tailed)	*r*
Argentina[a]	Male	8.9 (2.1)	1.87	206.8	0.062	0.129
	Female	8.4 (2.4)				
Bolivia	Male	6.0 (2.9)	–0.42	272	0.673	0.026
	Female	6.2 (2.8)				
Chile	Male	7.1 (2.7)	–0.45	318	0.650	0.026
	Female	7.3 (2.9)				
Cuba	Male	7.0 (2.4)	–0.35	304	0.727	0.020
	Female	7.1 (2.5)				
El Salvador	Male	5.5 (2.8)	–0.61	254	0.543	0.038
	Female	5.7 (2.6)				
Guatemala	Male	6.3 (2.7)	–3.42	211	0.001**	0.229
	Female	7.7 (2.9)				
Honduras	Male	5.7 (2.9)	0.18	182	0.857	0.013
	Female	5.6 (2.6)				
Mexico	Male	7.0 (2.7)	–0.04	1,297	0.969	0.001
	Female	7.0 (2.5)				
Paraguay	Male	4.8 (2.6)	10.44	260	0.152	0.089
	Female	4.4 (2.2)				
Peru	Male	6.9 (2.2)	–10.65	243	0.101	0.105
	Female	7.4 (2.4)				
Puerto Rico	Male	7.1 (2.9)	–2.11	290	0.036*	0.123
	Female	7.8 (2.6)				

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

the predicted value we just calculated ($e_i = y_i - \hat{y}_i$). In this case, it would be $e_i = 15 - 21.57 = -6.57$. d) Next, consult the SD_e column in Table 2 to obtain the country-specific SD_e (residual) value. For Puerto Rico it is 4.060. 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 $(-6.57)/4.060 = -1.618$. This is the standardized z score for a Puerto Rican woman aged 50 and 8 years of education and a score of 15 on the HVLT-R total recall 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 -1.618 corresponds to the 5th percentile. Please remember to use the appropriate tables that correspond to each test (total recall vs. delayed recall) when performing these calculations. If the percentile for the HVLT-R delayed 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 (HVLT-R total recall vs. HVLT-R delayed recall) in the Appendix. In order to obtain an approximate percentile for the above example (converting a raw score of 15 for a Puerto Rican woman who is 50 years old and has 8 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 HVLT-R total recall scores. In this case, the table for HVLT-R total recall scores for Puerto Rico can be found in Table A11. (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 in the table. Thus Table A11 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 8 years of education, she falls into the 1 to 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

Table 4
Final multiple linear regression models for HVLT-R delayed recall

Country		B	Std. Error	*t*	Sig.	R^2	SD_e (residual)
Argentina	(Constant)	9.688	0.331	29.280	<0.001	0.258	2.029
	Age	–0.042	0.006	–7.215	<0.001		
	Education	1.515	0.230	6.578	<0.001		
Bolivia	(Constant)	9.702	0.403	24.086	<0.001	0.253	2.424
	Age	–0.064	0.007	–9.594	<0.001		
Chile	(Constant)	10.707	0.431	24.827	<0.001	0.323	2.315
	Age	–0.069	0.007	–9.955	<0.001		
	Education	1.267	0.315	4.026	<0.001		
Cuba	(Constant)	8.987	0.367	24.486	<0.001	0.202	2.161
	Age	–0.044	0.006	–6.929	<0.001		
	Education	1.434	0.293	4.897	<0.001		
El Salvador	(Constant)	8.518	0.418	20.375	<0.001	0.313	2.237
	Age	–0.059	0.007	–8.617	<0.001		
	Education	1.995	0.345	5.782	<0.001		
Guatemala	(Constant)	8.912	0.621	14.346	<0.001	0.126	2.702
	Age	–0.044	0.011	–4.106	<0.001		
	Education	1.368	0.383	3.568	<0.001		
Honduras	(Constant)	7.727	0.520	14.853	<0.001	0.255	2.343
	Age	–0.051	0.009	–5.436	<0.001		
	Education	1.844	0.416	4.428	<0.001		
Mexico	(Constant)	9.800	0.178	54.966	<0.001	0.255	2.203
	Age	–0.057	0.003	–18.980	<0.001		
	Education	0.867	0.148	5.860	<0.001		
Paraguay	(Constant)	6.896	0.475	14.527	<0.001	0.449	1.781
	Age	–0.054	0.008	–6.636	<0.001		
	Education	2.872	0.315	9.114	<0.001		
Peru	(Constant)	8.576	0.369	23.211	<0.001	0.281	1.962
	Age	–0.048	0.006	–7.663	<0.001		
	Education	1.192	0.268	4.454	<0.001		
Puerto Rico	(Constant)	11.271	0.443	25.455	<0.001	0.340	2.236
	Age	–0.080	0.007	–10.868	<0.001		
	Education	0.704	0.272	2.587	0.010		

this case, 50 fall into the column 48–52 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 48–52 column, the score of 15 obtained by this Puerto Rican woman corresponds to an approximate percentile of 5.

4. Discussion

The purpose of the current study was to generate normative data on the HVLT-R 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 17–40% of the variance in total recall HVLT-R scores and 13–45% of the variance in delayed recall scores. Although women had higher scores on the HVLT-R total recall in Guatemala, there were no other significant gender differences, and this one effect size in Guatemala was small. Similarly, women had higher scores on the HVLT-R delayed recall in Puerto Rico and Guatemala, but again there were no other significant gender differences, and these two effect sizes were small. As a result, gender-adjusted norms were not generated. These findings fall fairly well in line with the previous research which has found inconsistencies with some studies showing that women slightly outperform men on the HVLT-R (Friedman et al., 2002; Vanderploeg et al., 2000), but other research showing no gender difference in HVLT-R performance (Strauss et al., 2006). In light of the previous literature, the current results suggest that gender should not be taken into account in calculating participants' percentiles for the HVLT-R in Latin America when using the norms from the current study.

HVLT-R total recall scores increased linearly as a function of education in all countries, and delayed recall scores increased as a function of education in all countries except Bolivia. These findings are generally consistent with previous research which has found that individuals with more than 12 years of education perform better on the HVLT-R than those

with lower education (Friedman et al., 2002). Therefore, neuropsychologists in Latin America should use education-adjusted norms generated for each country (except with Bolivia on the delayed recall) when administering the HVLT-R in that country. This is particularly important because research has found high rates of misclassification with the HVLT-R in a Spanish-speaking sample, likely suggesting differential score patterns in Spanish speakers with lower levels of education (Cherner et al., 2007).

In this study, total recall and delayed recall HVLT-R scores were inversely associated with age across all countries; thus, age-adjusted norms were calculated by country. These findings are in line with fairly robust previous research showing lower scores in participants with advancing age (Friedman et al., 2002; Strauss, Sherman, & Spreen, 2006; Vanderploeg et al., 2000). As with education, it is very important that neuropsychologists in Latin America use the age-adjusted norms by country generated in this study.

4.1. Limitations and future directions

This study has several limitations and directions for future research. First, clinicians should be careful in attempting to use the HVLT-R norms from this study for individuals in countries other than those from which data were collected. Future studies need to establish HVLT-R norms in other Latin American countries such as Ecuador, Uruguay, Venezuela, and Panama. Despite the severe limitations of using the current norms in other Spanish-speaking countries, the current norms may nonetheless be some of the most accurate to date for other regions in Latin America, as previous Spanish norms from the U.S.-Mexico border region have been shown to result in high rates of misclassification, especially in individuals with lower levels of education (Cherner et al., 2007). As a result, the current HVLT-R norms may be more accurate than others currently in use in routine neuropsychological assessment, but this generalizability is a critical area for future research.

Second, several sampling limitations should be noted. The HVLT-R is a common neuropsychological measure in Latin America, but many other common assessments are left to be normed in the same manner, a ripe area for future research. Research should also investigate the ecological validity of various neuropsychological assessments in Latin America. If low, there would be a strong need to create instruments in those cultures with stronger ecological validity. Indeed, the HVLT-R has established construct, concurrent, and discriminant validity (Benedict et al., 1998; Brandt, 1991; Rasmussan et al., 1995), but this has not been established in Latin America. Future research needs to create assessments within local cultures which would add to their cultural sensitivity, not simply translate and norm tests from other cultures.

Third, because participants spoke Spanish as their primary language, HVLT-R performance could differ for individuals who are bilingual and speak English or other local dialects. As a result, an area for future research would be the influence of bilingualism on HVLT-R performance, which was beyond the scope of this study. Also, the data collection in this study was specific to several regions within the various countries, and the norms and their national representativeness is unknown. Future studies should collect data form more nationalized samples. But nonetheless, the current study is the largest neuropsychological normative study for the HVLT-R in any global region conducted to date, and it is a critical first step toward larger studies with nationally representative samples. In the current sample, a sizeable group had fewer than 12 years of education, but illiterate individuals were excluded. Therefore the current norms may not generalize well to illiterate adults, and future research should be conducted with illiterate samples, those with neurological conditions, as well as children, all groups that were not included.

Although these limitations are present, only one other study to date has produced HVLT-R norms for Spanish-speaking individuals, which was conducted in the U.S.-Mexico border region (Cherner et al., 2007). As a result, this study was the first to create HVLT-R norms across 11 countries in Latin America with nearly 4,000 participants. It was therefore the largest and most comprehensive HVLT-R normative study conducted in any global region, and its norms have the strong potential to affect the standard of neuropsychological assessment with the HVLT-R in Latin America unlike any study before it.

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Appendix

Table A1
Normative data for the HVLT-R total 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	34.6	34.3	33.9	33.6	33.2	32.9	32.5	32.2	31.8	31.5	31.1	30.8	30.4
	90	33.1	32.7	32.4	32.0	31.7	31.3	31.0	30.6	30.3	29.9	29.6	29.2	28.9
	85	32.0	31.7	31.3	31.0	30.6	30.3	29.9	29.6	29.2	28.9	28.5	28.2	27.8
	80	31.1	30.8	30.4	30.1	29.7	29.4	29.1	28.7	28.4	28.0	27.7	27.3	27.0
	70	29.8	29.4	29.1	28.7	28.4	28.0	27.7	27.3	27.0	26.6	26.3	25.9	25.6
	60	28.6	28.2	27.9	27.5	27.2	26.8	26.5	26.1	25.8	25.4	25.1	24.7	24.4
	50	27.5	27.1	26.8	26.4	26.1	25.7	25.4	25.0	24.7	24.3	24.0	23.7	23.3
	40	26.4	26.0	25.7	25.4	25.0	24.7	24.3	24.0	23.6	23.3	22.9	22.6	22.2
	30	25.2	24.9	24.5	24.2	23.8	23.5	23.1	22.8	22.4	22.1	21.7	21.4	21.0
	20	23.8	23.5	23.1	22.8	22.4	22.1	21.7	21.4	21.0	20.7	20.3	20.0	19.6
	15	23.0	22.6	22.3	21.9	21.6	21.2	20.9	20.5	20.2	19.8	19.5	19.1	18.8
	10	21.9	21.6	21.2	20.9	20.5	20.2	19.8	19.5	19.1	18.8	18.4	18.1	17.7
	5	20.3	20.0	19.6	19.3	18.9	18.6	18.3	17.9	17.6	17.2	16.9	16.5	16.2
1 to 12 years of education	95	31.9	31.5	31.2	30.8	30.5	30.1	29.8	29.4	29.1	28.7	28.4	28.0	27.7
	90	30.3	29.9	29.6	29.3	28.9	28.6	28.2	27.9	27.5	27.2	26.8	26.5	26.1
	85	29.3	28.9	28.6	28.2	27.9	27.5	27.2	26.8	26.5	26.1	25.8	25.4	25.1
	80	28.4	28.0	27.7	27.3	27.0	26.6	26.3	25.9	25.6	25.2	24.9	24.5	24.2
	70	27.0	26.6	26.3	25.9	25.6	25.2	24.9	24.5	24.2	23.8	23.5	23.2	22.8
	60	25.8	25.5	25.1	24.8	24.4	24.1	23.7	23.4	23.0	22.7	22.3	22.0	21.6
	50	24.7	24.4	24.0	23.7	23.3	23.0	22.6	22.3	21.9	21.6	21.2	20.9	20.5
	40	23.6	23.3	22.9	22.6	22.2	21.9	21.5	21.2	20.8	20.5	20.1	19.8	19.4
	30	22.5	22.1	21.8	21.4	21.1	20.7	20.4	20.0	19.7	19.3	19.0	18.6	18.3
	20	21.1	20.7	20.4	20.0	19.7	19.3	19.0	18.6	18.3	17.9	17.6	17.2	16.9
	15	20.2	19.8	19.5	19.1	18.8	18.4	18.1	17.8	17.4	17.1	16.7	16.4	16.0
	10	19.1	18.8	18.4	18.1	17.8	17.4	17.1	16.7	16.4	16.0	15.7	15.3	15.0
	5	17.6	17.2	16.9	16.5	16.2	15.8	15.5	15.1	14.8	14.4	14.1	13.7	13.4

Table A2
Normative data for the HVLT-R total 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	32.5	31.9	31.4	30.8	30.3	29.7	29.1	28.6	28.0	27.5	26.9	26.3	25.8
	90	31.0	30.4	29.9	29.3	28.7	28.2	27.6	27.1	26.5	25.9	25.4	24.8	24.3
	85	30.0	29.4	28.8	28.3	27.7	27.2	26.6	26.0	25.5	24.9	24.4	23.8	23.2
	80	29.1	28.6	28.0	27.4	26.9	26.3	25.8	25.2	24.6	24.1	23.5	23.0	22.4
	70	27.8	27.2	26.7	26.1	25.5	25.0	24.4	23.9	23.3	22.7	22.2	21.6	21.1
	60	26.6	26.1	25.5	25.0	24.4	23.8	23.3	22.7	22.2	21.6	21.0	20.5	19.9
	50	25.6	25.0	24.5	23.9	23.3	22.8	22.2	21.7	21.1	20.5	20.0	19.4	18.9
	40	24.5	24.0	23.4	22.8	22.3	21.7	21.2	20.6	20.1	19.5	18.9	18.4	17.8
	30	23.4	22.8	22.3	21.7	21.2	20.6	20.0	19.5	18.9	18.4	17.8	17.2	16.7
	20	22.0	21.5	20.9	20.4	19.8	19.2	18.7	18.1	17.6	17.0	16.4	15.9	15.3
	15	21.2	20.6	20.1	19.5	19.0	18.4	17.8	17.3	16.7	16.2	15.6	15.0	14.5
	10	20.2	19.6	19.1	18.5	18.0	17.4	16.8	16.3	15.7	15.2	14.6	14.0	13.5
	5	18.7	18.1	17.6	17.0	16.4	15.9	15.3	14.8	14.2	13.6	13.1	12.5	12.0
1 to 12 years of education	95	29.2	28.7	28.1	27.5	27.0	26.4	25.9	25.3	24.8	24.2	23.6	23.1	22.5
	90	27.7	27.1	26.6	26.0	25.5	24.9	24.4	23.8	23.2	22.7	22.1	21.6	21.0
	85	26.7	26.1	25.6	25.0	24.5	23.9	23.3	22.8	22.2	21.7	21.1	20.5	20.0
	80	25.9	25.3	24.7	24.2	23.6	23.1	22.5	21.9	21.4	20.8	20.3	19.7	19.1
	70	24.5	23.9	23.4	22.8	22.3	21.7	21.2	20.6	20.0	19.5	18.9	18.4	17.8
	60	23.4	22.8	22.3	21.7	21.1	20.6	20.0	19.5	18.9	18.3	17.8	17.2	16.7
	50	22.3	21.8	21.2	20.6	20.1	19.5	19.0	18.4	17.8	17.3	16.7	16.2	15.6
	40	21.3	20.7	20.1	19.6	19.0	18.5	17.9	17.3	16.8	16.2	15.7	15.1	14.6
	30	20.1	19.6	19.0	18.4	17.9	17.3	16.8	16.2	15.7	15.1	14.5	14.0	13.4
	20	18.8	18.2	17.7	17.1	16.5	16.0	15.4	14.9	14.3	13.7	13.2	12.6	12.1
	15	17.9	17.4	16.8	16.3	15.7	15.1	14.6	14.0	13.5	12.9	12.3	11.8	11.2
	10	16.9	16.4	15.8	15.2	14.7	14.1	13.6	13.0	12.4	11.9	11.3	10.8	10.2
	5	15.4	14.8	14.3	13.7	13.2	12.6	12.1	11.5	10.9	10.4	9.8	9.3	8.7

Table A3
Normative data for the HVLT-R total 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	35.9	35.2	34.5	33.9	33.2	32.5	31.9	31.2	30.6	29.9	29.2	28.6	27.9
	90	34.2	33.5	32.8	32.2	31.5	30.8	30.2	29.5	28.9	28.2	27.5	26.9	26.2
	85	33.0	32.4	31.7	31.0	30.4	29.7	29.0	28.4	27.7	27.1	26.4	25.7	25.1
	80	32.1	31.4	30.7	30.1	29.4	28.8	28.1	27.4	26.8	26.1	25.5	24.8	24.1
	70	30.6	29.9	29.2	28.6	27.9	27.2	26.6	25.9	25.3	24.6	23.9	23.3	22.6
	60	29.3	28.6	27.9	27.3	26.6	26.0	25.3	24.6	24.0	23.3	22.7	22.0	21.3
	50	28.1	27.4	26.8	26.1	25.4	24.8	24.1	23.5	22.8	22.1	21.5	20.8	20.1
	40	26.9	26.2	25.6	24.9	24.3	23.6	22.9	22.3	21.6	20.9	20.3	19.6	19.0
	30	25.6	25.0	24.3	23.6	23.0	22.3	21.7	21.0	20.3	19.7	19.0	18.3	17.7
	20	24.1	23.4	22.8	22.1	21.5	20.8	20.1	19.5	18.8	18.2	17.5	16.8	16.2
	15	23.2	22.5	21.8	21.2	20.5	19.9	19.2	18.5	17.9	17.2	16.5	15.9	15.2
	10	22.0	21.4	20.7	20.0	19.4	18.7	18.1	17.4	16.7	16.1	15.4	14.7	14.1
	5	20.3	19.7	19.0	18.3	17.7	17.0	16.3	15.7	15.0	14.4	13.7	13.0	12.4
1 to 12 years of education	95	31.7	31.1	30.4	29.7	29.1	28.4	27.7	27.1	26.4	25.8	25.1	24.4	23.8
	90	30.0	29.4	28.7	28.0	27.4	26.7	26.0	25.4	24.7	24.1	23.4	22.7	22.1
	85	28.9	28.2	27.6	26.9	26.2	25.6	24.9	24.2	23.6	22.9	22.3	21.6	20.9
	80	27.9	27.3	26.6	25.9	25.3	24.6	24.0	23.3	22.6	22.0	21.3	20.6	20.0
	70	26.4	25.8	25.1	24.4	23.8	23.1	22.4	21.8	21.1	20.5	19.8	19.1	18.5
	60	25.1	24.5	23.8	23.1	22.5	21.8	21.2	20.5	19.8	19.2	18.5	17.9	17.2
	50	23.9	23.3	22.6	22.0	21.3	20.6	20.0	19.3	18.7	18.0	17.3	16.7	16.0
	40	22.8	22.1	21.4	20.8	20.1	19.5	18.8	18.1	17.5	16.8	16.1	15.5	14.8
	30	21.5	20.8	20.2	19.5	18.8	18.2	17.5	16.9	16.2	15.5	14.9	14.2	13.5
	20	20.0	19.3	18.6	18.0	17.3	16.7	16.0	15.3	14.7	14.0	13.4	12.7	12.0
	15	19.0	18.4	17.7	17.0	16.4	15.7	15.1	14.4	13.7	13.1	12.4	11.7	11.1
	10	17.9	17.2	16.6	15.9	15.2	14.6	13.9	13.3	12.6	11.9	11.3	10.6	9.9
	5	16.2	15.5	14.9	14.2	13.5	12.9	12.2	11.5	10.9	10.2	9.6	8.9	8.2

Table A4
Normative data for the HVLT-R total 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	33.7	33.1	32.6	32.0	31.4	30.8	30.3	29.7	29.1	28.5	28.0	27.4	26.8
	90	32.2	31.6	31.0	30.5	29.9	29.3	28.7	28.2	27.6	27.0	26.4	25.9	25.3
	85	31.2	30.6	30.0	29.4	28.9	28.3	27.7	27.1	26.6	26.0	25.4	24.8	24.3
	80	30.3	29.7	29.2	28.6	28.0	27.4	26.9	26.3	25.7	25.1	24.6	24.0	23.4
	70	28.9	28.4	27.8	27.2	26.6	26.1	25.5	24.9	24.3	23.8	23.2	22.6	22.0
	60	27.8	27.2	26.6	26.1	25.5	24.9	24.3	23.8	23.2	22.6	22.0	21.5	20.9
	50	26.7	26.1	25.6	25.0	24.4	23.8	23.3	22.7	22.1	21.5	21.0	20.4	19.8
	40	25.7	25.1	24.5	23.9	23.4	22.8	22.2	21.6	21.1	20.5	19.9	19.3	18.7
	30	24.5	23.9	23.4	22.8	22.2	21.6	21.1	20.5	19.9	19.3	18.7	18.2	17.6
	20	23.1	22.6	22.0	21.4	20.8	20.3	19.7	19.1	18.5	18.0	17.4	16.8	16.2
	15	22.3	21.7	21.1	20.6	20.0	19.4	18.8	18.3	17.7	17.1	16.5	16.0	15.4
	10	21.3	20.7	20.1	19.5	19.0	18.4	17.8	17.2	16.7	16.1	15.5	14.9	14.4
	5	19.7	19.2	18.6	18.0	17.4	16.8	16.3	15.7	15.1	14.5	14.0	13.4	12.8
1 to 12 years of education	95	30.9	30.3	29.7	29.2	28.6	28.0	27.4	26.9	26.3	25.7	25.1	24.6	24.0
	90	29.4	28.8	28.2	27.6	27.1	26.5	25.9	25.3	24.7	24.2	23.6	23.0	22.4
	85	28.3	27.8	27.2	26.6	26.0	25.5	24.9	24.3	23.7	23.2	22.6	22.0	21.4
	80	27.5	26.9	26.3	25.8	25.2	24.6	24.0	23.4	22.9	22.3	21.7	21.1	20.6
	70	26.1	25.5	25.0	24.4	23.8	23.2	22.7	22.1	21.5	20.9	20.4	19.8	19.2
	60	25.0	24.4	23.8	23.2	22.7	22.1	21.5	20.9	20.4	19.8	19.2	18.6	18.1
	50	23.9	23.3	22.7	22.2	21.6	21.0	20.4	19.9	19.3	18.7	18.1	17.6	17.0
	40	22.8	22.3	21.7	21.1	20.5	19.9	19.4	18.8	18.2	17.6	17.1	16.5	15.9
	30	21.7	21.1	20.5	19.9	19.4	18.8	18.2	17.6	17.1	16.5	15.9	15.3	14.8
	20	20.3	19.7	19.2	18.6	18.0	17.4	16.9	16.3	15.7	15.1	14.6	14.0	13.4
	15	19.5	18.9	18.3	17.7	17.2	16.6	16.0	15.4	14.9	14.3	13.7	13.1	12.5
	10	18.4	17.9	17.3	16.7	16.1	15.6	15.0	14.4	13.8	13.3	12.7	12.1	11.5
	5	16.9	16.3	15.7	15.2	14.6	14.0	13.4	12.9	12.3	11.7	11.1	10.6	10.0

Table A5
Normative data for the HVLT-R total 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	33.6	33.1	32.5	32.0	31.4	30.8	30.3	29.7	29.2	28.6	28.1	27.5	26.9
	90	32.0	31.4	30.8	30.3	29.7	29.2	28.6	28.0	27.5	26.9	26.4	25.8	25.3
	85	30.8	30.3	29.7	29.2	28.6	28.0	27.5	26.9	26.4	25.8	25.3	24.7	24.1
	80	29.9	29.3	28.8	28.2	27.7	27.1	26.6	26.0	25.4	24.9	24.3	23.8	23.2
	70	28.4	27.9	27.3	26.7	26.2	25.6	25.1	24.5	23.9	23.4	22.8	22.3	21.7
	60	27.2	26.6	26.0	25.5	24.9	24.4	23.8	23.2	22.7	22.1	21.6	21.0	20.5
	50	26.0	25.4	24.9	24.3	23.8	23.2	22.6	22.1	21.5	21.0	20.4	19.8	19.3
	40	24.8	24.3	23.7	23.2	22.6	22.0	21.5	20.9	20.4	19.8	19.2	18.7	18.1
	30	23.6	23.0	22.5	21.9	21.3	20.8	20.2	19.7	19.1	18.5	18.0	17.4	16.9
	20	22.1	21.5	21.0	20.4	19.8	19.3	18.7	18.2	17.6	17.1	16.5	15.9	15.4
	15	21.1	20.6	20.0	19.5	18.9	18.4	17.8	17.2	16.7	16.1	15.6	15.0	14.4
	10	20.0	19.5	18.9	18.4	17.8	17.2	16.7	16.1	15.6	15.0	14.4	13.9	13.3
	5	18.4	17.8	17.2	16.7	16.1	15.6	15.0	14.4	13.9	13.3	12.8	12.2	11.6
1 to 12 years of education	95	28.3	27.8	27.2	26.7	26.1	25.6	25.0	24.4	23.9	23.3	22.8	22.2	21.6
	90	26.7	26.1	25.6	25.0	24.4	23.9	23.3	22.8	22.2	21.6	21.1	20.5	20.0
	85	25.6	25.0	24.4	23.9	23.3	22.8	22.2	21.6	21.1	20.5	20.0	19.4	18.9
	80	24.6	24.1	23.5	22.9	22.4	21.8	21.3	20.7	20.2	19.6	19.0	18.5	17.9
	70	23.1	22.6	22.0	21.5	20.9	20.3	19.8	19.2	18.7	18.1	17.5	17.0	16.4
	60	21.9	21.3	20.8	20.2	19.6	19.1	18.5	18.0	17.4	16.8	16.3	15.7	15.2
	50	20.7	20.1	19.6	19.0	18.5	17.9	17.4	16.8	16.2	15.7	15.1	14.6	14.0
	40	19.5	19.0	18.4	17.9	17.3	16.7	16.2	15.6	15.1	14.5	14.0	13.4	12.8
	30	18.3	17.7	17.2	16.6	16.0	15.5	14.9	14.4	13.8	13.3	12.7	12.1	11.6
	20	16.8	16.2	15.7	15.1	14.6	14.0	13.4	12.9	12.3	11.8	11.2	10.6	10.1
	15	15.9	15.3	14.7	14.2	13.6	13.1	12.5	11.9	11.4	10.8	10.3	9.7	9.2
	10	14.7	14.2	13.6	13.1	12.5	11.9	11.4	10.8	10.3	9.7	9.2	8.6	8.0
	5	13.1	12.5	11.9	11.4	10.8	10.3	9.7	9.2	8.6	8.0	7.5	6.9	6.4

Table A6
Normative data for the HVLT-R total 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	33.7	33.2	32.8	32.3	31.8	31.4	30.9	30.5	30.0	29.5	29.1	28.6	28.2
	90	31.9	31.5	31.0	30.6	30.1	29.6	29.2	28.7	28.2	27.8	27.3	26.9	26.4
	85	30.8	30.3	29.8	29.4	28.9	28.5	28.0	27.5	27.1	26.6	26.2	25.7	25.2
	80	29.8	29.3	28.9	28.4	27.9	27.5	27.0	26.6	26.1	25.6	25.2	24.7	24.3
	70	28.2	27.8	27.3	26.9	26.4	25.9	25.5	25.0	24.6	24.1	23.6	23.2	22.7
	60	26.9	26.5	26.0	25.5	25.1	24.6	24.2	23.7	23.2	22.8	22.3	21.9	21.4
	50	25.7	25.2	24.8	24.3	23.9	23.4	22.9	22.5	22.0	21.6	21.1	20.6	20.2
	40	24.5	24.0	23.6	23.1	22.6	22.2	21.7	21.3	20.8	20.3	19.9	19.4	19.0
	30	23.2	22.7	22.3	21.8	21.3	20.9	20.4	19.9	19.5	19.0	18.6	18.1	17.6
	20	21.6	21.2	20.7	20.2	19.8	19.3	18.9	18.4	17.9	17.5	17.0	16.6	16.1
	15	20.6	20.2	19.7	19.3	18.8	18.3	17.9	17.4	17.0	16.5	16.0	15.6	15.1
	10	19.5	19.0	18.6	18.1	17.6	17.2	16.7	16.3	15.8	15.3	14.9	14.4	13.9
	5	17.7	17.3	16.8	16.3	15.9	15.4	15.0	14.5	14.0	13.6	13.1	12.7	12.2
1 to 12 years of education	95	30.7	30.2	29.7	29.3	28.8	28.4	27.9	27.4	27.0	26.5	26.1	25.6	25.1
	90	28.9	28.4	28.0	27.5	27.1	26.6	26.1	25.7	25.2	24.8	24.3	23.8	23.4
	85	27.7	27.3	26.8	26.4	25.9	25.4	25.0	24.5	24.1	23.6	23.1	22.7	22.2
	80	26.8	26.3	25.8	25.4	24.9	24.5	24.0	23.5	23.1	22.6	22.2	21.7	21.2
	70	25.2	24.7	24.3	23.8	23.4	22.9	22.4	22.0	21.5	21.1	20.6	20.1	19.7
	60	23.9	23.4	23.0	22.5	22.0	21.6	21.1	20.7	20.2	19.7	19.3	18.8	18.4
	50	22.7	22.2	21.8	21.3	20.8	20.4	19.9	19.5	19.0	18.5	18.1	17.6	17.2
	40	21.5	21.0	20.5	20.1	19.6	19.2	18.7	18.2	17.8	17.3	16.9	16.4	15.9
	30	20.1	19.7	19.2	18.8	18.3	17.8	17.4	16.9	16.5	16.0	15.5	15.1	14.6
	20	18.6	18.1	17.7	17.2	16.7	16.3	15.8	15.4	14.9	14.4	14.0	13.5	13.1
	15	17.6	17.2	16.7	16.2	15.8	15.3	14.9	14.4	13.9	13.5	13.0	12.5	12.1
	10	16.4	16.0	15.5	15.1	14.6	14.1	13.7	13.2	12.8	12.3	11.8	11.4	10.9
	5	14.7	14.2	13.8	13.3	12.9	12.4	11.9	11.5	11.0	10.5	10.1	9.6	9.2

Table A7
Normative data for the HVLT-R total recall 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	29.7	29.2	28.7	28.2	27.7	27.2	26.7	26.2	25.7	25.2	24.7	24.2	23.7
	90	28.2	27.7	27.2	26.7	26.2	25.7	25.2	24.7	24.2	23.7	23.2	22.7	22.1
	85	27.2	26.7	26.2	25.7	25.2	24.7	24.2	23.7	23.2	22.7	22.2	21.6	21.1
	80	26.3	25.8	25.3	24.8	24.3	23.8	23.3	22.8	22.3	21.8	21.3	20.8	20.3
	70	25.0	24.5	24.0	23.5	23.0	22.5	22.0	21.5	21.0	20.5	20.0	19.5	19.0
	60	23.9	23.4	22.9	22.4	21.9	21.4	20.9	20.4	19.9	19.4	18.8	18.3	17.8
	50	22.8	22.3	21.8	21.3	20.8	20.3	19.8	19.3	18.8	18.3	17.8	17.3	16.8
	40	21.8	21.3	20.8	20.3	19.8	19.3	18.8	18.3	17.8	17.3	16.8	16.3	15.8
	30	20.7	20.2	19.7	19.1	18.6	18.1	17.6	17.1	16.6	16.1	15.6	15.1	14.6
	20	19.3	18.8	18.3	17.8	17.3	16.8	16.3	15.8	15.3	14.8	14.3	13.8	13.3
	15	18.5	18.0	17.5	17.0	16.5	16.0	15.5	15.0	14.5	14.0	13.5	13.0	12.5
	10	17.5	17.0	16.5	16.0	15.5	15.0	14.5	14.0	13.5	13.0	12.5	12.0	11.4
	5	16.0	15.5	15.0	14.5	14.0	13.5	13.0	12.5	12.0	11.5	10.9	10.4	9.9
1 to 12 years of education	95	25.9	25.4	24.9	24.4	23.9	23.4	22.9	22.4	21.9	21.4	20.9	20.4	19.9
	90	24.4	23.9	23.4	22.9	22.4	21.9	21.4	20.9	20.4	19.9	19.4	18.9	18.4
	85	23.4	22.9	22.4	21.9	21.4	20.9	20.4	19.9	19.4	18.9	18.4	17.9	17.4
	80	22.6	22.1	21.6	21.1	20.6	20.1	19.6	19.1	18.6	18.1	17.6	17.1	16.5
	70	21.2	20.7	20.2	19.7	19.2	18.7	18.2	17.7	17.2	16.7	16.2	15.7	15.2
	60	20.1	19.6	19.1	18.6	18.1	17.6	17.1	16.6	16.1	15.6	15.1	14.6	14.1
	50	19.1	18.6	18.1	17.6	17.1	16.6	16.1	15.5	15.0	14.5	14.0	13.5	13.0
	40	18.0	17.5	17.0	16.5	16.0	15.5	15.0	14.5	14.0	13.5	13.0	12.5	12.0
	30	16.9	16.4	15.9	15.4	14.9	14.4	13.9	13.4	12.9	12.4	11.9	11.4	10.9
	20	15.6	15.1	14.6	14.0	13.5	13.0	12.5	12.0	11.5	11.0	10.5	10.0	9.5
	15	14.7	14.2	13.7	13.2	12.7	12.2	11.7	11.2	10.7	10.2	9.7	9.2	8.7
	10	13.7	13.2	12.7	12.2	11.7	11.2	10.7	10.2	9.7	9.2	8.7	8.2	7.7
	5	12.2	11.7	11.2	10.7	10.2	9.7	9.2	8.7	8.2	7.7	7.2	6.7	6.2

Table A8
Normative data for the HVLT-R total 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	33.1	32.5	32.0	31.4	30.8	30.3	29.7	29.2	28.6	28.0	27.5	26.9	26.4
	90	31.5	30.9	30.4	29.8	29.3	28.7	28.1	27.6	27.0	26.5	25.9	25.3	24.8
	85	30.4	29.9	29.3	28.8	28.2	27.6	27.1	26.5	26.0	25.4	24.8	24.3	23.7
	80	29.6	29.0	28.4	27.9	27.3	26.8	26.2	25.6	25.1	24.5	24.0	23.4	22.8
	70	28.1	27.6	27.0	26.5	25.9	25.3	24.8	24.2	23.7	23.1	22.5	22.0	21.4
	60	26.9	26.4	25.8	25.3	24.7	24.1	23.6	23.0	22.5	21.9	21.3	20.8	20.2
	50	25.8	25.3	24.7	24.2	23.6	23.0	22.5	21.9	21.4	20.8	20.2	19.7	19.1
	40	24.7	24.2	23.6	23.1	22.5	21.9	21.4	20.8	20.3	19.7	19.1	18.6	18.0
	30	23.5	23.0	22.4	21.9	21.3	20.7	20.2	19.6	19.1	18.5	17.9	17.4	16.8
	20	22.1	21.6	21.0	20.5	19.9	19.3	18.8	18.2	17.7	17.1	16.5	16.0	15.4
	15	21.2	20.7	20.1	19.6	19.0	18.4	17.9	17.3	16.8	16.2	15.6	15.1	14.5
	10	20.2	19.6	19.1	18.5	17.9	17.4	16.8	16.3	15.7	15.1	14.6	14.0	13.5
	5	18.6	18.0	17.5	16.9	16.4	15.8	15.2	14.7	14.1	13.6	13.0	12.4	11.9
1 to 12 years of education	95	30.9	30.4	29.8	29.3	28.7	28.1	27.6	27.0	26.5	25.9	25.3	24.8	24.2
	90	29.3	28.8	28.2	27.7	27.1	26.5	26.0	25.4	24.9	24.3	23.7	23.2	22.6
	85	28.3	27.7	27.2	26.6	26.0	25.5	24.9	24.4	23.8	23.2	22.7	22.1	21.6
	80	27.4	26.8	26.3	25.7	25.2	24.6	24.0	23.5	22.9	22.4	21.8	21.2	20.7
	70	26.0	25.4	24.9	24.3	23.7	23.2	22.6	22.1	21.5	20.9	20.4	19.8	19.3
	60	24.8	24.2	23.7	23.1	22.5	22.0	21.4	20.9	20.3	19.8	19.2	18.6	18.1
	50	23.7	23.1	22.6	22.0	21.4	20.9	20.3	19.8	19.2	18.6	18.1	17.5	17.0
	40	22.6	22.0	21.5	20.9	20.3	19.8	19.2	18.7	18.1	17.5	17.0	16.4	15.9
	30	21.4	20.8	20.3	19.7	19.1	18.6	18.0	17.5	16.9	16.3	15.8	15.2	14.7
	20	20.0	19.4	18.9	18.3	17.7	17.2	16.6	16.1	15.5	14.9	14.4	13.8	13.3
	15	19.1	18.5	18.0	17.4	16.8	16.3	15.7	15.2	14.6	14.0	13.5	12.9	12.4
	10	18.0	17.5	16.9	16.3	15.8	15.2	14.7	14.1	13.5	13.0	12.4	11.9	11.3
	5	16.4	15.9	15.3	14.8	14.2	13.6	13.1	12.5	12.0	11.4	10.8	10.3	9.7

Table A9
Normative data for the HVLT-R total 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	30.6	30.0	29.5	28.9	28.4	27.8	27.3	26.7	26.1	25.6	25.0	24.5	23.9
	90	29.2	28.6	28.1	27.5	26.9	26.4	25.8	25.3	24.7	24.1	23.6	23.0	22.5
	85	28.2	27.7	27.1	26.5	26.0	25.4	24.9	24.3	23.7	23.2	22.6	22.1	21.5
	80	27.4	26.9	26.3	25.7	25.2	24.6	24.1	23.5	22.9	22.4	21.8	21.3	20.7
	70	26.1	25.6	25.0	24.5	23.9	23.4	22.8	22.2	21.7	21.1	20.6	20.0	19.4
	60	25.1	24.5	24.0	23.4	22.8	22.3	21.7	21.2	20.6	20.0	19.5	18.9	18.4
	50	24.1	23.5	23.0	22.4	21.8	21.3	20.7	20.2	19.6	19.0	18.5	17.9	17.4
	40	23.1	22.5	22.0	21.4	20.8	20.3	19.7	19.2	18.6	18.0	17.5	16.9	16.4
	30	22.0	21.4	20.9	20.3	19.8	19.2	18.6	18.1	17.5	17.0	16.4	15.9	15.3
	20	20.7	20.2	19.6	19.0	18.5	17.9	17.4	16.8	16.3	15.7	15.1	14.6	14.0
	15	19.9	19.4	18.8	18.3	17.7	17.1	16.6	16.0	15.5	14.9	14.3	13.8	13.2
	10	19.0	18.4	17.9	17.3	16.7	16.2	15.6	15.1	14.5	13.9	13.4	12.8	12.3
	5	17.5	17.0	16.4	15.9	15.3	14.7	14.2	13.6	13.1	12.5	11.9	11.4	10.8
1 to 12 years of education	95	24.9	24.4	23.8	23.2	22.7	22.1	21.6	21.0	20.5	19.9	19.3	18.8	18.2
	90	23.5	22.9	22.4	21.8	21.3	20.7	20.1	19.6	19.0	18.5	17.9	17.3	16.8
	85	22.5	22.0	21.4	20.9	20.3	19.7	19.2	18.6	18.1	17.5	16.9	16.4	15.8
	80	21.7	21.2	20.6	20.1	19.5	18.9	18.4	17.8	17.3	16.7	16.1	15.6	15.0
	70	20.5	19.9	19.3	18.8	18.2	17.7	17.1	16.5	16.0	15.4	14.9	14.3	13.8
	60	19.4	18.8	18.3	17.7	17.1	16.6	16.0	15.5	14.9	14.4	13.8	13.2	12.7
	50	18.4	17.8	17.3	16.7	16.2	15.6	15.0	14.5	13.9	13.4	12.8	12.2	11.7
	40	17.4	16.8	16.3	15.7	15.2	14.6	14.0	13.5	12.9	12.4	11.8	11.2	10.7
	30	16.3	15.8	15.2	14.6	14.1	13.5	13.0	12.4	11.8	11.3	10.7	10.2	9.6
	20	15.0	14.5	13.9	13.4	12.8	12.2	11.7	11.1	10.6	10.0	9.4	8.9	8.3
	15	14.2	13.7	13.1	12.6	12.0	11.4	10.9	10.3	9.8	9.2	8.7	8.1	7.5
	10	13.3	12.7	12.2	11.6	11.1	10.5	9.9	9.4	8.8	8.3	7.7	7.1	6.6
	5	11.9	11.3	10.7	10.2	9.6	9.1	8.5	7.9	7.4	6.8	6.3	5.7	5.1

Table A10
Normative data for the HVLT-R total 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	32.0	31.6	31.1	30.6	30.1	29.7	29.2	28.7	28.2	27.8	27.3	26.8	26.3
	90	30.5	30.0	29.5	29.0	28.6	28.1	27.6	27.1	26.6	26.2	25.7	25.2	24.7
	85	29.4	28.9	28.5	28.0	27.5	27.0	26.5	26.1	25.6	25.1	24.6	24.2	23.7
	80	28.5	28.1	27.6	27.1	26.6	26.1	25.7	25.2	24.7	24.2	23.8	23.3	22.8
	70	27.1	26.6	26.2	25.7	25.2	24.7	24.3	23.8	23.3	22.8	22.4	21.9	21.4
	60	25.9	25.5	25.0	24.5	24.0	23.6	23.1	22.6	22.1	21.6	21.2	20.7	20.2
	50	24.8	24.4	23.9	23.4	22.9	22.5	22.0	21.5	21.0	20.6	20.1	19.6	19.1
	40	23.7	23.3	22.8	22.3	21.8	21.4	20.9	20.4	19.9	19.5	19.0	18.5	18.0
	30	22.6	22.1	21.6	21.1	20.7	20.2	19.7	19.2	18.7	18.3	17.8	17.3	16.8
	20	21.2	20.7	20.2	19.7	19.2	18.8	18.3	17.8	17.3	16.9	16.4	15.9	15.4
	15	20.3	19.8	19.3	18.8	18.4	17.9	17.4	16.9	16.5	16.0	15.5	15.0	14.6
	10	19.2	18.7	18.3	17.8	17.3	16.8	16.4	15.9	15.4	14.9	14.5	14.0	13.5
	5	17.6	17.2	16.7	16.2	15.7	15.3	14.8	14.3	13.8	13.4	12.9	12.4	11.9
1 to 12 years of education	95	30.0	29.6	29.1	28.6	28.1	27.7	27.2	26.7	26.2	25.8	25.3	24.8	24.3
	90	28.5	28.0	27.5	27.0	26.6	26.1	25.6	25.1	24.6	24.2	23.7	23.2	22.7
	85	27.4	26.9	26.5	26.0	25.5	25.0	24.5	24.1	23.6	23.1	22.6	22.2	21.7
	80	26.5	26.1	25.6	25.1	24.6	24.1	23.7	23.2	22.7	22.2	21.8	21.3	20.8
	70	25.1	24.6	24.2	23.7	23.2	22.7	22.3	21.8	21.3	20.8	20.4	19.9	19.4
	60	23.9	23.5	23.0	22.5	22.0	21.6	21.1	20.6	20.1	19.6	19.2	18.7	18.2
	50	22.8	22.4	21.9	21.4	20.9	20.5	20.0	19.5	19.0	18.6	18.1	17.6	17.1
	40	21.7	21.3	20.8	20.3	19.8	19.4	18.9	18.4	17.9	17.5	17.0	16.5	16.0
	30	20.6	20.1	19.6	19.1	18.7	18.2	17.7	17.2	16.7	16.3	15.8	15.3	14.8
	20	19.2	18.7	18.2	17.7	17.2	16.8	16.3	15.8	15.3	14.9	14.4	13.9	13.4
	15	18.3	17.8	17.3	16.8	16.4	15.9	15.4	14.9	14.5	14.0	13.5	13.0	12.6
	10	17.2	16.7	16.3	15.8	15.3	14.8	14.4	13.9	13.4	12.9	12.5	12.0	11.5
	5	15.6	15.2	14.7	14.2	13.7	13.3	12.8	12.3	11.8	11.4	10.9	10.4	9.9

Table A11
Normative data for the HVLT-R total 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	34.1	33.3	32.5	31.8	31.0	30.2	29.5	28.7	28.0	27.2	26.4	25.7	24.9
	90	32.6	31.8	31.1	30.3	29.5	28.8	28.0	27.3	26.5	25.7	25.0	24.2	23.5
	85	31.6	30.9	30.1	29.3	28.6	27.8	27.1	26.3	25.5	24.8	24.0	23.2	22.5
	80	30.8	30.0	29.3	28.5	27.8	27.0	26.2	25.5	24.7	24.0	23.2	22.4	21.7
	70	29.5	28.7	28.0	27.2	26.5	25.7	24.9	24.2	23.4	22.7	21.9	21.1	20.4
	60	28.4	27.7	26.9	26.1	25.4	24.6	23.8	23.1	22.3	21.6	20.8	20.0	19.3
	50	27.4	26.6	25.9	25.1	24.4	23.6	22.8	22.1	21.3	20.5	19.8	19.0	18.3
	40	26.4	25.6	24.9	24.1	23.3	22.6	21.8	21.1	20.3	19.5	18.8	18.0	17.2
	30	25.3	24.5	23.8	23.0	22.2	21.5	20.7	20.0	19.2	18.4	17.7	16.9	16.1
	20	24.0	23.2	22.5	21.7	20.9	20.2	19.4	18.7	17.9	17.1	16.4	15.6	14.8
	15	23.2	22.4	21.7	20.9	20.1	19.4	18.6	17.8	17.1	16.3	15.6	14.8	14.0
	10	22.2	21.4	20.7	19.9	19.2	18.4	17.6	16.9	16.1	15.3	14.6	13.8	13.1
	5	20.7	20.0	19.2	18.5	17.7	16.9	16.2	15.4	14.6	13.9	13.1	12.4	11.6
1 to 12 years of education	95	32.8	32.0	31.3	30.5	29.7	29.0	28.2	27.5	26.7	25.9	25.2	24.4	23.7
	90	31.3	30.6	29.8	29.0	28.3	27.5	26.8	26.0	25.2	24.5	23.7	23.0	22.2
	85	30.4	29.6	28.8	28.1	27.3	26.6	25.8	25.0	24.3	23.5	22.7	22.0	21.2
	80	29.5	28.8	28.0	27.3	26.5	25.7	25.0	24.2	23.5	22.7	21.9	21.2	20.4
	70	28.2	27.5	26.7	26.0	25.2	24.4	23.7	22.9	22.2	21.4	20.6	19.9	19.1
	60	27.2	26.4	25.6	24.9	24.1	23.3	22.6	21.8	21.1	20.3	19.5	18.8	18.0
	50	26.1	25.4	24.6	23.9	23.1	22.3	21.6	20.8	20.0	19.3	18.5	17.8	17.0
	40	25.1	24.4	23.6	22.8	22.1	21.3	20.6	19.8	19.0	18.3	17.5	16.7	16.0
	30	24.0	23.3	22.5	21.7	21.0	20.2	19.5	18.7	17.9	17.2	16.4	15.6	14.9
	20	22.7	22.0	21.2	20.4	19.7	18.9	18.2	17.4	16.6	15.9	15.1	14.3	13.6
	15	21.9	21.2	20.4	19.6	18.9	18.1	17.3	16.6	15.8	15.1	14.3	13.5	12.8
	10	20.9	20.2	19.4	18.7	17.9	17.1	16.4	15.6	14.8	14.1	13.3	12.6	11.8
	5	19.5	18.7	18.0	17.2	16.4	15.7	14.9	14.1	13.4	12.6	11.9	11.1	10.3

Table A12
Normative data for the HVLT-R delayed 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	–	–	–	–	–	12.0	12.0	12.0	12.0	11.8	11.6	11.3	11.1
	90	–	–	–	12.0	12.0	11.9	11.7	11.5	11.3	11.0	10.8	10.6	10.4
	85	–	12.0	12.0	11.8	11.6	11.4	11.2	11.0	10.8	10.6	10.3	10.1	9.9
	80	12.0	11.8	11.6	11.4	11.2	11.0	10.8	10.6	10.4	10.1	9.9	9.7	9.5
	70	11.4	11.2	11.0	10.8	10.6	10.3	10.1	9.9	9.7	9.5	9.3	9.1	8.9
	60	10.9	10.6	10.4	10.2	10.0	9.8	9.6	9.4	9.2	8.9	8.7	8.5	8.3
	50	10.4	10.1	9.9	9.7	9.5	9.3	9.1	8.9	8.7	8.4	8.2	8.0	7.8
	40	9.8	9.6	9.4	9.2	9.0	8.8	8.6	8.4	8.1	7.9	7.7	7.5	7.3
	30	9.3	9.1	8.9	8.7	8.4	8.2	8.0	7.8	7.6	7.4	7.2	7.0	6.7
	20	8.6	8.4	8.2	8.0	7.8	7.6	7.4	7.2	6.9	6.7	6.5	6.3	6.1
	15	8.2	8.0	7.8	7.6	7.4	7.2	7.0	6.8	6.5	6.3	6.1	5.9	5.7
	10	7.8	7.5	7.3	7.1	6.9	6.7	6.5	6.3	6.1	5.8	5.6	5.4	5.2
	5	7.0	6.8	6.6	6.4	6.2	6.0	5.8	5.5	5.3	5.1	4.9	4.7	4.5
1 to 12 years of education	95	12.0	12.0	11.7	11.5	11.3	11.1	10.9	10.7	10.5	10.3	10.0	9.8	9.6
	90	11.4	11.2	11.0	10.8	10.6	10.4	10.2	9.9	9.7	9.5	9.3	9.1	8.9
	85	10.9	10.7	10.5	10.3	10.1	9.9	9.7	9.5	9.2	9.0	8.8	8.6	8.4
	80	10.5	10.3	10.1	9.9	9.7	9.5	9.3	9.1	8.8	8.6	8.4	8.2	8.0
	70	9.9	9.7	9.5	9.3	9.0	8.8	8.6	8.4	8.2	8.0	7.8	7.6	7.3
	60	9.3	9.1	8.9	8.7	8.5	8.3	8.1	7.9	7.6	7.4	7.2	7.0	6.8
	50	8.8	8.6	8.4	8.2	8.0	7.8	7.6	7.4	7.1	6.9	6.7	6.5	6.3
	40	8.3	8.1	7.9	7.7	7.5	7.3	7.1	6.8	6.6	6.4	6.2	6.0	5.8
	30	7.8	7.6	7.4	7.1	6.9	6.7	6.5	6.3	6.1	5.9	5.7	5.4	5.2
	20	7.1	6.9	6.7	6.5	6.3	6.1	5.9	5.6	5.4	5.2	5.0	4.8	4.6
	15	6.7	6.5	6.3	6.1	5.9	5.7	5.5	5.2	5.0	4.8	4.6	4.4	4.2
	10	6.2	6.0	5.8	5.6	5.4	5.2	5.0	4.8	4.5	4.3	4.1	3.9	3.7
	5	5.5	5.3	5.1	4.9	4.7	4.4	4.2	4.0	3.8	3.6	3.4	3.2	3.0

Table A13
Normative data for the HVLT-R delayed recall stratified by age 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
95	12.0	12.0	11.8	11.4	11.1	10.8	10.5	10.2	9.8	9.5	9.2	8.9	8.5
90	11.5	11.2	10.9	10.6	10.2	9.9	9.6	9.3	9.0	8.6	8.3	8.0	7.7
85	10.9	10.6	10.3	10.0	9.7	9.3	9.0	8.7	8.4	8.0	7.7	7.4	7.1
80	10.5	10.1	9.8	9.5	9.2	8.8	8.5	8.2	7.9	7.6	7.2	6.9	6.6
70	9.7	9.4	9.0	8.7	8.4	8.1	7.7	7.4	7.1	6.8	6.5	6.1	5.8
60	9.0	8.7	8.4	8.1	7.7	7.4	7.1	6.8	6.4	6.1	5.8	5.5	5.2
50	8.4	8.1	7.8	7.4	7.1	6.8	6.5	6.2	5.8	5.5	5.2	4.9	4.5
40	7.8	7.5	7.2	6.8	6.5	6.2	5.9	5.5	5.2	4.9	4.6	4.3	3.9
30	7.1	6.8	6.5	6.2	5.9	5.5	5.2	4.9	4.6	4.2	3.9	3.6	3.3
20	6.4	6.0	5.7	5.4	5.1	4.8	4.4	4.1	3.8	3.5	3.1	2.8	2.5
15	5.9	5.6	5.2	4.9	4.6	4.3	3.9	3.6	3.3	3.0	2.7	2.3	2.0
10	5.3	5.0	4.6	4.3	4.0	3.7	3.4	3.0	2.7	2.4	2.1	1.7	1.4
5	4.4	4.1	3.8	3.4	3.1	2.8	2.5	2.2	1.8	1.5	1.2	0.9	0.5

Table A14
Normative data for the HVLT-R delayed 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	–	–	–	–	–	12.0	12.0	12.0	11.6	11.3	10.9	10.6	10.3
	90	–	–	–	–	12.0	11.8	11.5	11.1	10.8	10.5	10.1	9.8	9.4
	85	–	–	12.0	12.0	11.6	11.3	10.9	10.6	10.2	9.9	9.6	9.2	8.9
	80	12.0	12.0	11.9	11.5	11.2	10.8	10.5	10.1	9.8	9.4	9.1	8.7	8.4
	70	11.8	11.5	11.1	10.8	10.4	10.1	9.7	9.4	9.0	8.7	8.4	8.0	7.7
	60	11.2	10.8	10.5	10.1	9.8	9.4	9.1	8.8	8.4	8.1	7.7	7.4	7.0
	50	10.6	10.3	9.9	9.6	9.2	8.9	8.5	8.2	7.8	7.5	7.1	6.8	6.5
	40	10.0	9.7	9.3	9.0	8.6	8.3	7.9	7.6	7.3	6.9	6.6	6.2	5.9
	30	9.4	9.0	8.7	8.4	8.0	7.7	7.3	7.0	6.6	6.3	5.9	5.6	5.3
	20	8.7	8.3	8.0	7.6	7.3	6.9	6.6	6.2	5.9	5.5	5.2	4.9	4.5
	15	8.2	7.8	7.5	7.2	6.8	6.5	6.1	5.8	5.4	5.1	4.7	4.4	4.1
	10	7.6	7.3	6.9	6.6	6.3	5.9	5.6	5.2	4.9	4.5	4.2	3.8	3.5
	5	6.8	6.5	6.1	5.8	5.4	5.1	4.7	4.4	4.0	3.7	3.4	3.0	2.7
1 to 12 years of education	95	–	12.0	12.0	12.0	11.7	11.4	11.1	10.7	10.4	10.0	9.7	9.3	9.0
	90	12.0	11.9	11.6	11.3	10.9	10.6	10.2	9.9	9.5	9.2	8.8	8.5	8.2
	85	11.7	11.4	11.0	10.7	10.4	10.0	9.7	9.3	9.0	8.6	8.3	7.9	7.6
	80	11.3	10.9	10.6	10.2	9.9	9.5	9.2	8.9	8.5	8.2	7.8	7.5	7.1
	70	10.5	10.2	9.8	9.5	9.2	8.8	8.5	8.1	7.8	7.4	7.1	6.7	6.4
	60	9.9	9.6	9.2	8.9	8.5	8.2	7.8	7.5	7.1	6.8	6.5	6.1	5.8
	50	9.3	9.0	8.6	8.3	7.9	7.6	7.3	6.9	6.6	6.2	5.9	5.5	5.2
	40	8.7	8.4	8.1	7.7	7.4	7.0	6.7	6.3	6.0	5.6	5.3	5.0	4.6
	30	8.1	7.8	7.4	7.1	6.7	6.4	6.1	5.7	5.4	5.0	4.7	4.3	4.0
	20	7.4	7.0	6.7	6.3	6.0	5.7	5.3	5.0	4.6	4.3	3.9	3.6	3.2
	15	6.9	6.6	6.2	5.9	5.5	5.2	4.9	4.5	4.2	3.8	3.5	3.1	2.8
	10	6.4	6.0	5.7	5.3	5.0	4.6	4.3	4.0	3.6	3.3	2.9	2.6	2.2
	5	5.5	5.2	4.8	4.5	4.2	3.8	3.5	3.1	2.8	2.4	2.1	1.7	1.4

Table A15
Normative data for the HVLT-R delayed 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	–	–	12.0	12.0	12.0	12.0	11.8	11.6	11.3	11.1	10.9	10.7	10.5
	90	12.0	12.0	11.9	11.7	11.4	11.2	11.0	10.8	10.6	10.3	10.1	9.9	9.7
	85	11.8	11.6	11.4	11.1	10.9	10.7	10.5	10.3	10.0	9.8	9.6	9.4	9.2
	80	11.4	11.1	10.9	10.7	10.5	10.3	10.1	9.8	9.6	9.4	9.2	9.0	8.7
	70	10.7	10.5	10.2	10.0	9.8	9.6	9.4	9.1	8.9	8.7	8.5	8.3	8.1
	60	10.1	9.9	9.7	9.4	9.2	9.0	8.8	8.6	8.3	8.1	7.9	7.7	7.5
	50	9.5	9.3	9.1	8.9	8.7	8.5	8.2	8.0	7.8	7.6	7.4	7.1	6.9
	40	9.0	8.8	8.6	8.4	8.1	7.9	7.7	7.5	7.3	7.0	6.8	6.6	6.4
	30	8.4	8.2	8.0	7.8	7.5	7.3	7.1	6.9	6.7	6.5	6.2	6.0	5.8
	20	7.7	7.5	7.3	7.1	6.9	6.6	6.4	6.2	6.0	5.8	5.5	5.3	5.1
	15	7.3	7.1	6.9	6.6	6.4	6.2	6.0	5.8	5.6	5.3	5.1	4.9	4.7
	10	6.8	6.6	6.3	6.1	5.9	5.7	5.5	5.3	5.0	4.8	4.6	4.4	4.2
	5	6.0	5.8	5.6	5.3	5.1	4.9	4.7	4.5	4.3	4.0	3.8	3.6	3.4
1 to 12 years of education	95	11.7	11.4	11.2	11.0	10.8	10.6	10.3	10.1	9.9	9.7	9.5	9.3	9.0
	90	10.9	10.7	10.4	10.2	10.0	9.8	9.6	9.4	9.1	8.9	8.7	8.5	8.3
	85	10.4	10.1	9.9	9.7	9.5	9.3	9.1	8.8	8.6	8.4	8.2	8.0	7.7
	80	9.9	9.7	9.5	9.3	9.1	8.8	8.6	8.4	8.2	8.0	7.7	7.5	7.3
	70	9.2	9.0	8.8	8.6	8.4	8.1	7.9	7.7	7.5	7.3	7.1	6.8	6.6
	60	8.7	8.4	8.2	8.0	7.8	7.6	7.3	7.1	6.9	6.7	6.5	6.3	6.0
	50	8.1	7.9	7.7	7.5	7.2	7.0	6.8	6.6	6.4	6.1	5.9	5.7	5.5
	40	7.6	7.4	7.1	6.9	6.7	6.5	6.3	6.0	5.8	5.6	5.4	5.2	5.0
	30	7.0	6.8	6.6	6.3	6.1	5.9	5.7	5.5	5.2	5.0	4.8	4.6	4.4
	20	6.3	6.1	5.9	5.6	5.4	5.2	5.0	4.8	4.6	4.3	4.1	3.9	3.7
	15	5.9	5.6	5.4	5.2	5.0	4.8	4.6	4.3	4.1	3.9	3.7	3.5	3.2
	10	5.3	5.1	4.9	4.7	4.5	4.3	4.0	3.8	3.6	3.4	3.2	2.9	2.7
	5	4.6	4.4	4.1	3.9	3.7	3.5	3.3	3.0	2.8	2.6	2.4	2.2	1.9

Table A16
Normative data for the HVLT-R delayed 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	–	12.0	12.0	12.0	11.8	11.5	11.2	11.0	10.7	10.4	10.1	9.8	9.5
	90	12.0	11.9	11.6	11.3	11.0	10.7	10.4	10.2	9.9	9.6	9.3	9.0	8.7
	85	11.7	11.4	11.1	10.8	10.5	10.2	9.9	9.6	9.3	9.0	8.7	8.4	8.1
	80	11.2	10.9	10.6	10.3	10.0	9.8	9.5	9.2	8.9	8.6	8.3	8.0	7.7
	70	10.5	10.2	9.9	9.6	9.3	9.0	8.7	8.5	8.2	7.9	7.6	7.3	7.0
	60	9.9	9.6	9.3	9.0	8.7	8.4	8.1	7.8	7.6	7.3	7.0	6.7	6.4
	50	9.3	9.0	8.8	8.5	8.2	7.9	7.6	7.3	7.0	6.7	6.4	6.1	5.8
	40	8.8	8.5	8.2	7.9	7.6	7.3	7.0	6.7	6.4	6.1	5.8	5.6	5.3
	30	8.2	7.9	7.6	7.3	7.0	6.7	6.4	6.1	5.8	5.5	5.2	5.0	4.7
	20	7.5	7.2	6.9	6.6	6.3	6.0	5.7	5.4	5.1	4.8	4.5	4.2	3.9
	15	7.0	6.7	6.4	6.1	5.8	5.5	5.3	5.0	4.7	4.4	4.1	3.8	3.5
	10	6.5	6.2	5.9	5.6	5.3	5.0	4.7	4.4	4.1	3.8	3.5	3.2	3.0
	5	5.7	5.4	5.1	4.8	4.5	4.2	3.9	3.6	3.3	3.0	2.7	2.4	2.2
1 to 12 years of education	95	11.0	10.7	10.4	10.1	9.8	9.5	9.3	9.0	8.7	8.4	8.1	7.8	7.5
	90	10.2	9.9	9.6	9.3	9.0	8.7	8.4	8.2	7.9	7.6	7.3	7.0	6.7
	85	9.7	9.4	9.1	8.8	8.5	8.2	7.9	7.6	7.3	7.0	6.7	6.4	6.2
	80	9.2	8.9	8.6	8.3	8.1	7.8	7.5	7.2	6.9	6.6	6.3	6.0	5.7
	70	8.5	8.2	7.9	7.6	7.3	7.0	6.7	6.5	6.2	5.9	5.6	5.3	5.0
	60	7.9	7.6	7.3	7.0	6.7	6.4	6.1	5.9	5.6	5.3	5.0	4.7	4.4
	50	7.3	7.1	6.8	6.5	6.2	5.9	5.6	5.3	5.0	4.7	4.4	4.1	3.8
	40	6.8	6.5	6.2	5.9	5.6	5.3	5.0	4.7	4.4	4.1	3.9	3.6	3.3
	30	6.2	5.9	5.6	5.3	5.0	4.7	4.4	4.1	3.8	3.5	3.2	3.0	2.7
	20	5.5	5.2	4.9	4.6	4.3	4.0	3.7	3.4	3.1	2.8	2.5	2.2	1.9
	15	5.0	4.7	4.4	4.1	3.8	3.6	3.3	3.0	2.7	2.4	2.1	1.8	1.5
	10	4.5	4.2	3.9	3.6	3.3	3.0	2.7	2.4	2.1	1.8	1.5	1.3	1.0
	5	3.7	3.4	3.1	2.8	2.5	2.2	1.9	1.6	1.3	1.0	0.7	0.4	0.2

Table A17
Normative data for the HVLT-R delayed 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	–	–	–	–	–	12.0	12.0	12.0	12.0	11.8	11.6	11.4	11.2
	90	–	–	12.0	12.0	12.0	11.7	11.5	11.3	11.1	10.9	10.6	10.4	10.2
	85	12.0	12.0	11.8	11.5	11.3	11.1	10.9	10.7	10.4	10.2	10.0	9.8	9.5
	80	11.7	11.4	11.2	11.0	10.8	10.6	10.3	10.1	9.9	9.7	9.4	9.2	9.0
	70	10.8	10.6	10.4	10.1	9.9	9.7	9.5	9.2	9.0	8.8	8.6	8.4	8.1
	60	10.1	9.8	9.6	9.4	9.2	9.0	8.7	8.5	8.3	8.1	7.9	7.6	7.4
	50	9.4	9.2	9.0	8.7	8.5	8.3	8.1	7.8	7.6	7.4	7.2	7.0	6.7
	40	8.7	8.5	8.3	8.1	7.8	7.6	7.4	7.2	6.9	6.7	6.5	6.3	6.1
	30	8.0	7.8	7.5	7.3	7.1	6.9	6.7	6.4	6.2	6.0	5.8	5.6	5.3
	20	7.1	6.9	6.7	6.5	6.2	6.0	5.8	5.6	5.4	5.1	4.9	4.7	4.5
	15	6.6	6.4	6.1	5.9	5.7	5.5	5.3	5.0	4.8	4.6	4.4	4.1	3.9
	10	5.9	5.7	5.5	5.3	5.0	4.8	4.6	4.4	4.2	3.9	3.7	3.5	3.3
	5	5.0	4.7	4.5	4.3	4.1	3.9	3.6	3.4	3.2	3.0	2.7	2.5	2.3
1 to 12 years of education	95	12.0	12.0	12.0	11.8	11.6	11.4	11.1	10.9	10.7	10.5	10.2	10.0	9.8
	90	11.5	11.3	11.0	10.8	10.6	10.4	10.2	9.9	9.7	9.5	9.3	9.0	8.8
	85	10.8	10.6	10.4	10.2	10.0	9.7	9.5	9.3	9.1	8.8	8.6	8.4	8.2
	80	10.3	10.1	9.9	9.6	9.4	9.2	9.0	8.7	8.5	8.3	8.1	7.9	7.6
	70	9.4	9.2	9.0	8.8	8.5	8.3	8.1	7.9	7.7	7.4	7.2	7.0	6.8
	60	8.7	8.5	8.3	8.0	7.8	7.6	7.4	7.2	6.9	6.7	6.5	6.3	6.0
	50	8.0	7.8	7.6	7.4	7.1	6.9	6.7	6.5	6.3	6.0	5.8	5.6	5.4
	40	7.4	7.1	6.9	6.7	6.5	6.2	6.0	5.8	5.6	5.4	5.1	4.9	4.7
	30	6.6	6.4	6.2	6.0	5.7	5.5	5.3	5.1	4.8	4.6	4.4	4.2	4.0
	20	5.8	5.5	5.3	5.1	4.9	4.6	4.4	4.2	4.0	3.8	3.5	3.3	3.1
	15	5.2	5.0	4.8	4.6	4.3	4.1	3.9	3.7	3.4	3.2	3.0	2.8	2.6
	10	4.6	4.3	4.1	3.9	3.7	3.5	3.2	3.0	2.8	2.6	2.4	2.1	1.9
	5	3.6	3.4	3.2	2.9	2.7	2.5	2.3	2.0	1.8	1.6	1.4	1.2	0.9

Table A18
Normative data for the HVLT-R delayed recall 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	12.0	12.0	11.9	11.6	11.4	11.1	10.8	10.6	10.3	10.1	9.8	9.6	9.3
	90	11.5	11.3	11.0	10.8	10.5	10.3	10.0	9.7	9.5	9.2	9.0	8.7	8.5
	85	11.0	10.7	10.5	10.2	10.0	9.7	9.4	9.2	8.9	8.7	8.4	8.2	7.9
	80	10.5	10.3	10.0	9.7	9.5	9.2	9.0	8.7	8.5	8.2	7.9	7.7	7.4
	70	9.8	9.5	9.2	9.0	8.7	8.5	8.2	8.0	7.7	7.4	7.2	6.9	6.7
	60	9.1	8.9	8.6	8.4	8.1	7.8	7.6	7.3	7.1	6.8	6.6	6.3	6.0
	50	8.5	8.3	8.0	7.8	7.5	7.3	7.0	6.7	6.5	6.2	6.0	5.7	5.5
	40	8.0	7.7	7.4	7.2	6.9	6.7	6.4	6.2	5.9	5.6	5.4	5.1	4.9
	30	7.3	7.1	6.8	6.6	6.3	6.0	5.8	5.5	5.3	5.0	4.8	4.5	4.2
	20	6.6	6.3	6.1	5.8	5.5	5.3	5.0	4.8	4.5	4.3	4.0	3.7	3.5
	15	6.1	5.8	5.6	5.3	5.1	4.8	4.6	4.3	4.0	3.8	3.5	3.3	3.0
	10	5.5	5.3	5.0	4.8	4.5	4.3	4.0	3.7	3.5	3.2	3.0	2.7	2.5
	5	4.7	4.4	4.2	3.9	3.7	3.4	3.2	2.9	2.6	2.4	2.1	1.9	1.6
1 to 12 years of education	95	10.5	10.3	10.0	9.8	9.5	9.3	9.0	8.7	8.5	8.2	8.0	7.7	7.5
	90	9.7	9.4	9.2	8.9	8.7	8.4	8.2	7.9	7.6	7.4	7.1	6.9	6.6
	85	9.1	8.9	8.6	8.4	8.1	7.8	7.6	7.3	7.1	6.8	6.6	6.3	6.0
	80	8.7	8.4	8.2	7.9	7.6	7.4	7.1	6.9	6.6	6.4	6.1	5.8	5.6
	70	7.9	7.7	7.4	7.1	6.9	6.6	6.4	6.1	5.9	5.6	5.3	5.1	4.8
	60	7.3	7.0	6.8	6.5	6.3	6.0	5.7	5.5	5.2	5.0	4.7	4.5	4.2
	50	6.7	6.4	6.2	5.9	5.7	5.4	5.2	4.9	4.6	4.4	4.1	3.9	3.6
	40	6.1	5.9	5.6	5.3	5.1	4.8	4.6	4.3	4.1	3.8	3.5	3.3	3.0
	30	5.5	5.2	5.0	4.7	4.5	4.2	3.9	3.7	3.4	3.2	2.9	2.7	2.4
	20	4.7	4.5	4.2	4.0	3.7	3.4	3.2	2.9	2.7	2.4	2.2	1.9	1.6
	15	4.3	4.0	3.7	3.5	3.2	3.0	2.7	2.5	2.2	1.9	1.7	1.4	1.2
	10	3.7	3.4	3.2	2.9	2.7	2.4	2.2	1.9	1.6	1.4	1.1	0.9	0.6
	5	2.9	2.6	2.3	2.1	1.8	1.6	1.3	1.1	0.8	0.5	0.3	–	–

Table A19
Normative data for the HVLT-R delayed 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	–	–	12.0	12.0	12.0	11.7	11.4	11.1	10.8	10.6	10.3	10.0	9.7
	90	12.0	12.0	11.8	11.5	11.2	10.9	10.6	10.3	10.0	9.8	9.5	9.2	8.9
	85	11.8	11.5	11.2	11.0	10.7	10.4	10.1	9.8	9.5	9.2	8.9	8.7	8.4
	80	11.4	11.1	10.8	10.5	10.2	9.9	9.7	9.4	9.1	8.8	8.5	8.2	7.9
	70	10.7	10.4	10.1	9.8	9.5	9.2	8.9	8.7	8.4	8.1	7.8	7.5	7.2
	60	10.1	9.8	9.5	9.2	8.9	8.6	8.4	8.1	7.8	7.5	7.2	6.9	6.6
	50	9.5	9.2	8.9	8.7	8.4	8.1	7.8	7.5	7.2	6.9	6.7	6.4	6.1
	40	9.0	8.7	8.4	8.1	7.8	7.5	7.2	7.0	6.7	6.4	6.1	5.8	5.5
	30	8.4	8.1	7.8	7.5	7.2	6.9	6.7	6.4	6.1	5.8	5.5	5.2	4.9
	20	7.7	7.4	7.1	6.8	6.5	6.2	5.9	5.7	5.4	5.1	4.8	4.5	4.2
	15	7.2	6.9	6.7	6.4	6.1	5.8	5.5	5.2	4.9	4.6	4.4	4.1	3.8
	10	6.7	6.4	6.1	5.8	5.6	5.3	5.0	4.7	4.4	4.1	3.8	3.5	3.3
	5	5.9	5.6	5.3	5.0	4.8	4.5	4.2	3.9	3.6	3.3	3.0	2.8	2.5
1 to 12 years of education	95	12.0	12.0	11.7	11.4	11.1	10.8	10.5	10.3	10.0	9.7	9.4	9.1	8.8
	90	11.5	11.2	10.9	10.6	10.3	10.0	9.8	9.5	9.2	8.9	8.6	8.3	8.0
	85	10.9	10.7	10.4	10.1	9.8	9.5	9.2	8.9	8.7	8.4	8.1	7.8	7.5
	80	10.5	10.2	9.9	9.6	9.4	9.1	8.8	8.5	8.2	7.9	7.6	7.4	7.1
	70	9.8	9.5	9.2	8.9	8.7	8.4	8.1	7.8	7.5	7.2	6.9	6.6	6.4
	60	9.2	8.9	8.6	8.3	8.1	7.8	7.5	7.2	6.9	6.6	6.3	6.1	5.8
	50	8.7	8.4	8.1	7.8	7.5	7.2	6.9	6.6	6.4	6.1	5.8	5.5	5.2
	40	8.1	7.8	7.5	7.2	7.0	6.7	6.4	6.1	5.8	5.5	5.2	4.9	4.7
	30	7.5	7.2	6.9	6.6	6.4	6.1	5.8	5.5	5.2	4.9	4.6	4.4	4.1
	20	6.8	6.5	6.2	5.9	5.7	5.4	5.1	4.8	4.5	4.2	3.9	3.6	3.4
	15	6.4	6.1	5.8	5.5	5.2	4.9	4.6	4.4	4.1	3.8	3.5	3.2	2.9
	10	5.8	5.5	5.3	5.0	4.7	4.4	4.1	3.8	3.5	3.3	3.0	2.7	2.4
	5	5.0	4.8	4.5	4.2	3.9	3.6	3.3	3.0	2.7	2.5	2.2	1.9	1.6

Table A20
Normative data for the HVLT-R delayed 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	11.6	11.3	11.1	10.8	10.5	10.2	10.0	9.7	9.4	9.1	8.9	8.6	8.3
	90	11.0	10.7	10.4	10.1	9.9	9.6	9.3	9.1	8.8	8.5	8.2	8.0	7.7
	85	10.5	10.3	10.0	9.7	9.4	9.2	8.9	8.6	8.4	8.1	7.8	7.5	7.3
	80	10.2	9.9	9.6	9.4	9.1	8.8	8.5	8.3	8.0	7.7	7.4	7.2	6.9
	70	9.6	9.3	9.1	8.8	8.5	8.2	8.0	7.7	7.4	7.2	6.9	6.6	6.3
	60	9.1	8.9	8.6	8.3	8.0	7.8	7.5	7.2	6.9	6.7	6.4	6.1	5.9
	50	8.7	8.4	8.1	7.9	7.6	7.3	7.0	6.8	6.5	6.2	6.0	5.7	5.4
	40	8.2	8.0	7.7	7.4	7.1	6.9	6.6	6.3	6.1	5.8	5.5	5.2	5.0
	30	7.8	7.5	7.2	6.9	6.7	6.4	6.1	5.8	5.6	5.3	5.0	4.8	4.5
	20	7.2	6.9	6.6	6.4	6.1	5.8	5.5	5.3	5.0	4.7	4.5	4.2	3.9
	15	6.8	6.6	6.3	6.0	5.7	5.5	5.2	4.9	4.6	4.4	4.1	3.8	3.6
	10	6.4	6.1	5.9	5.6	5.3	5.0	4.8	4.5	4.2	3.9	3.7	3.4	3.1
	5	5.8	5.5	5.2	4.9	4.7	4.4	4.1	3.9	3.6	3.3	3.0	2.8	2.5
1 to 12 years of education	95	8.7	8.5	8.2	7.9	7.6	7.4	7.1	6.8	6.5	6.3	6.0	5.7	5.5
	90	8.1	7.8	7.5	7.3	7.0	6.7	6.5	6.2	5.9	5.6	5.4	5.1	4.8
	85	7.7	7.4	7.1	6.8	6.6	6.3	6.0	5.8	5.5	5.2	4.9	4.7	4.4
	80	7.3	7.0	6.8	6.5	6.2	5.9	5.7	5.4	5.1	4.9	4.6	4.3	4.0
	70	6.7	6.5	6.2	5.9	5.6	5.4	5.1	4.8	4.6	4.3	4.0	3.7	3.5
	60	6.3	6.0	5.7	5.4	5.2	4.9	4.6	4.3	4.1	3.8	3.5	3.3	3.0
	50	5.8	5.5	5.3	5.0	4.7	4.4	4.2	3.9	3.6	3.4	3.1	2.8	2.5
	40	5.4	5.1	4.8	4.5	4.3	4.0	3.7	3.5	3.2	2.9	2.6	2.4	2.1
	30	4.9	4.6	4.3	4.1	3.8	3.5	3.2	3.0	2.7	2.4	2.2	1.9	1.6
	20	4.3	4.0	3.8	3.5	3.2	2.9	2.7	2.4	2.1	1.9	1.6	1.3	1.0
	15	4.0	3.7	3.4	3.1	2.9	2.6	2.3	2.0	1.8	1.5	1.2	1.0	0.7
	10	3.5	3.3	3.0	2.7	2.4	2.2	1.9	1.6	1.3	1.1	0.8	0.5	0.3
	5	2.9	2.6	2.3	2.1	1.8	1.5	1.3	1.0	0.7	0.4	0.2	–	–

Table A21
Normative data for the HVLT-R delayed 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	12.0	11.8	11.6	11.3	11.1	10.8	10.6	10.4	10.1	9.9	9.6	9.4	9.2
	90	11.3	11.1	10.8	10.6	10.4	10.1	9.9	9.7	9.4	9.2	8.9	8.7	8.5
	85	10.9	10.6	10.4	10.1	9.9	9.7	9.4	9.2	8.9	8.7	8.5	8.2	8.0
	80	10.5	10.2	10.0	9.7	9.5	9.3	9.0	8.8	8.5	8.3	8.1	7.8	7.6
	70	9.8	9.6	9.4	9.1	8.9	8.6	8.4	8.2	7.9	7.7	7.4	7.2	7.0
	60	9.3	9.1	8.8	8.6	8.3	8.1	7.9	7.6	7.4	7.2	6.9	6.7	6.4
	50	8.8	8.6	8.3	8.1	7.9	7.6	7.4	7.1	6.9	6.7	6.4	6.2	5.9
	40	8.3	8.1	7.8	7.6	7.4	7.1	6.9	6.6	6.4	6.2	5.9	5.7	5.5
	30	7.8	7.6	7.3	7.1	6.8	6.6	6.4	6.1	5.9	5.6	5.4	5.2	4.9
	20	7.2	6.9	6.7	6.4	6.2	6.0	5.7	5.5	5.3	5.0	4.8	4.5	4.3
	15	6.8	6.5	6.3	6.1	5.8	5.6	5.3	5.1	4.9	4.6	4.4	4.1	3.9
	10	6.3	6.1	5.8	5.6	5.3	5.1	4.9	4.6	4.4	4.2	3.9	3.7	3.4
	5	5.6	5.4	5.1	4.9	4.6	4.4	4.2	3.9	3.7	3.4	3.2	3.0	2.7
1 to 12 years of education	95	10.8	10.6	10.4	10.1	9.9	9.6	9.4	9.2	8.9	8.7	8.4	8.2	8.0
	90	10.1	9.9	9.7	9.4	9.2	8.9	8.7	8.5	8.2	8.0	7.7	7.5	7.3
	85	9.7	9.4	9.2	8.9	8.7	8.5	8.2	8.0	7.7	7.5	7.3	7.0	6.8
	80	9.3	9.0	8.8	8.6	8.3	8.1	7.8	7.6	7.4	7.1	6.9	6.6	6.4
	70	8.6	8.4	8.2	7.9	7.7	7.4	7.2	7.0	6.7	6.5	6.3	6.0	5.8
	60	8.1	7.9	7.6	7.4	7.2	6.9	6.7	6.4	6.2	6.0	5.7	5.5	5.2
	50	7.6	7.4	7.1	6.9	6.7	6.4	6.2	5.9	5.7	5.5	5.2	5.0	4.8
	40	7.1	6.9	6.7	6.4	6.2	5.9	5.7	5.5	5.2	5.0	4.7	4.5	4.3
	30	6.6	6.4	6.1	5.9	5.6	5.4	5.2	4.9	4.7	4.4	4.2	4.0	3.7
	20	6.0	5.7	5.5	5.3	5.0	4.8	4.5	4.3	4.1	3.8	3.6	3.3	3.1
	15	5.6	5.3	5.1	4.9	4.6	4.4	4.1	3.9	3.7	3.4	3.2	3.0	2.7
	10	5.1	4.9	4.6	4.4	4.2	3.9	3.7	3.4	3.2	3.0	2.7	2.5	2.2
	5	4.4	4.2	3.9	3.7	3.4	3.2	3.0	2.7	2.5	2.3	2.0	1.8	1.5

Table A22
Normative data for the HVLT-R delayed 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	–	–	–	–	12.0	12.0	11.6	11.2	10.8	10.4	10.0	9.6	9.2
	90	–	–	12.0	12.0	11.6	11.2	10.8	10.4	10.0	9.6	9.2	8.8	8.4
	85	–	12.0	11.9	11.5	11.1	10.7	10.3	9.9	9.5	9.1	8.7	8.3	7.9
	80	12.0	11.9	11.5	11.1	10.7	10.3	9.9	9.5	9.1	8.7	8.3	7.9	7.5
	70	11.5	11.1	10.7	10.3	9.9	9.5	9.1	8.7	8.3	7.9	7.5	7.1	6.7
	60	10.9	10.5	10.1	9.7	9.3	8.9	8.5	8.1	7.7	7.3	6.9	6.5	6.1
	50	10.4	10.0	9.6	9.2	8.8	8.4	8.0	7.6	7.2	6.8	6.4	6.0	5.6
	40	9.8	9.4	9.0	8.6	8.2	7.8	7.4	7.0	6.6	6.2	5.8	5.4	5.0
	30	9.2	8.8	8.4	8.0	7.6	7.2	6.8	6.4	6.0	5.6	5.2	4.8	4.4
	20	8.5	8.1	7.7	7.3	6.9	6.5	6.1	5.7	5.3	4.9	4.5	4.1	3.7
	15	8.1	7.7	7.3	6.9	6.5	6.1	5.7	5.3	4.9	4.5	4.1	3.7	3.3
	10	7.5	7.1	6.7	6.3	5.9	5.5	5.1	4.7	4.3	3.9	3.5	3.1	2.7
	5	6.7	6.3	5.9	5.5	5.1	4.7	4.3	3.9	3.5	3.1	2.7	2.3	1.9
1 to 12 years of education	95	–	–	12.0	12.0	11.7	11.3	10.9	10.5	10.1	9.7	9.3	8.9	8.5
	90	–	12.0	11.7	11.3	10.9	10.5	10.1	9.7	9.3	8.9	8.5	8.1	7.7
	85	12.0	11.6	11.2	10.8	10.4	10.0	9.6	9.2	8.8	8.4	8.0	7.6	7.2
	80	11.5	11.1	10.7	10.3	9.9	9.6	9.2	8.8	8.4	8.0	7.6	7.2	6.8
	70	10.8	10.4	10.0	9.6	9.2	8.8	8.4	8.0	7.6	7.2	6.8	6.4	6.0
	60	10.2	9.8	9.4	9.0	8.6	8.2	7.8	7.4	7.0	6.6	6.2	5.8	5.4
	50	9.7	9.3	8.9	8.5	8.1	7.7	7.3	6.9	6.5	6.1	5.7	5.3	4.9
	40	9.1	8.7	8.3	7.9	7.5	7.1	6.7	6.3	5.9	5.5	5.1	4.7	4.3
	30	8.5	8.1	7.7	7.3	6.9	6.5	6.1	5.7	5.3	4.9	4.5	4.1	3.7
	20	7.8	7.4	7.0	6.6	6.2	5.8	5.4	5.0	4.6	4.2	3.8	3.4	3.0
	15	7.3	6.9	6.5	6.1	5.7	5.3	4.9	4.5	4.1	3.7	3.3	2.9	2.5
	10	6.8	6.4	6.0	5.6	5.2	4.8	4.4	4.0	3.6	3.2	2.8	2.4	2.0
	5	6.0	5.6	5.2	4.8	4.4	4.0	3.6	3.2	2.8	2.4	2.0	1.6	1.2