

## SAGE Validity and Normative Data

The tables and figures below provide validity and normative data on SAGE.

Table 1: **Self Administered Gerocognitive Examination (SAGE)** scores and Mini-Mental State Examination (MMSE) scores of normal, Mild Cognitive Impairment (MCI), and mild stage dementia subjects

	Normal (n=21)	MCI (n=21)	Dementia (n=21)
<b>SAGE Scores: Mean <math>\pm</math> Std Dev Maximum score = 22 (Range)</b>	<b>19.8 <math>\pm</math> 2.0 (22-15)</b>	<b>16.0 <math>\pm</math> 3.2 (21-9)</b>	<b>11.4 <math>\pm</math> 3.9 (17-4)</b>
MMSE Scores: Mean $\pm$ Std Dev Maximum score = 30 (Range)	28.7 $\pm$ 1.1 (30-26)	27.7 $\pm$ 2.2 (30-23)	22.1 $\pm$ 3.5 (28-16)

Scharre et al. *Alzheimer Dis Assoc Disord* 2010;24:64-71

**Self Administered Gerocognitive Examination (SAGE)** Inter-rater Reliability: ICC coefficient = 0.96

**Self Administered Gerocognitive Examination (SAGE)** Test-retest Reliability: Spearman Rank correlation = 0.86.

Table 2: **Self Administered Gerocognitive Examination (SAGE)** Specificity and Sensitivity with Suggestive SAGE Cut-off Scores

	Normal (n)	MCI (n)	Dementia (n)	AUC	Specificity (%)	Sensitivity (%)	Cut-off Score
<b>Detecting any cognitive impairment (MCI or dementia) from normal subjects</b>	21	42		0.919	<b>95</b>	<b>79</b>	<b><math>\leq 16</math></b>
Detecting MCI from normal subjects	21	21	0	0.850	<b>95</b>	<b>62</b>	<b><math>\leq 16</math></b>
Detecting dementia from normal subjects	21	0	21	0.988	<b>95</b>	<b>95</b>	<b><math>\leq 16</math></b>
Detecting dementia from non-dementia (normal or MCI) subjects	42		21	0.906	<b>88</b>	<b>81</b>	<b><math>\leq 14</math></b>

MCI: Mild Cognitive Impairment; AUC: Area under the Receiver Operating Characteristics (ROC) curve.

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Those scoring 16 or less on SAGE are likely to have mild cognitive impairment or dementia and those scoring 14 or less on SAGE are likely to have a dementia condition. There are hundreds of causes of cognitive impairment or dementia. SAGE is not diagnostic of any specific medical or dementia condition, and consultation with a healthcare professional is recommended for further evaluation.

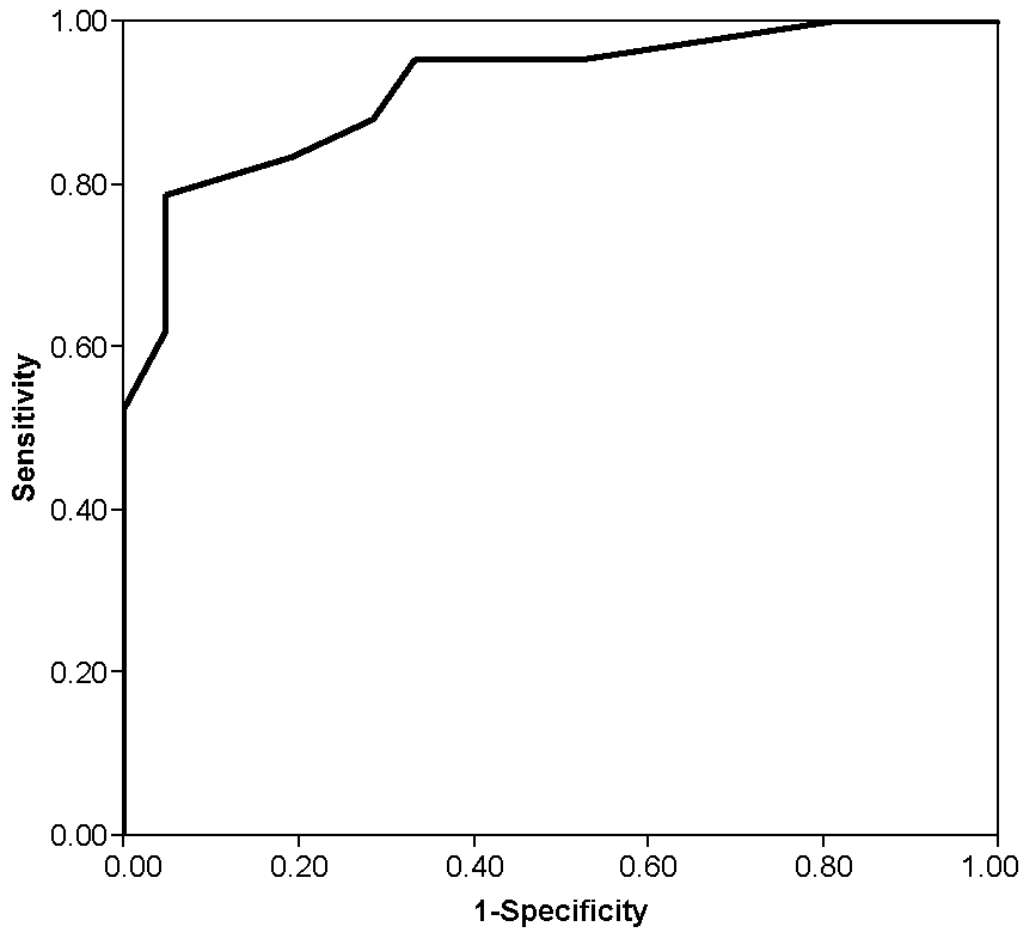


Figure 1. Receiver Operating Characteristics (ROC) for **Self Administered Gerocognitive Examination (SAGE)** differentiating normal from cognitively impaired (Mild Cognitive Impairment (MCI) or dementia) subjects. 1- specificity = false positive%, sensitivity = true positive%. SAGE specificity was 95% and sensitivity 79% with Area Under the Curve (AUC) 0.92. Scharre et al. *Alzheimer Dis Assoc Disord* 2010;24:64-71

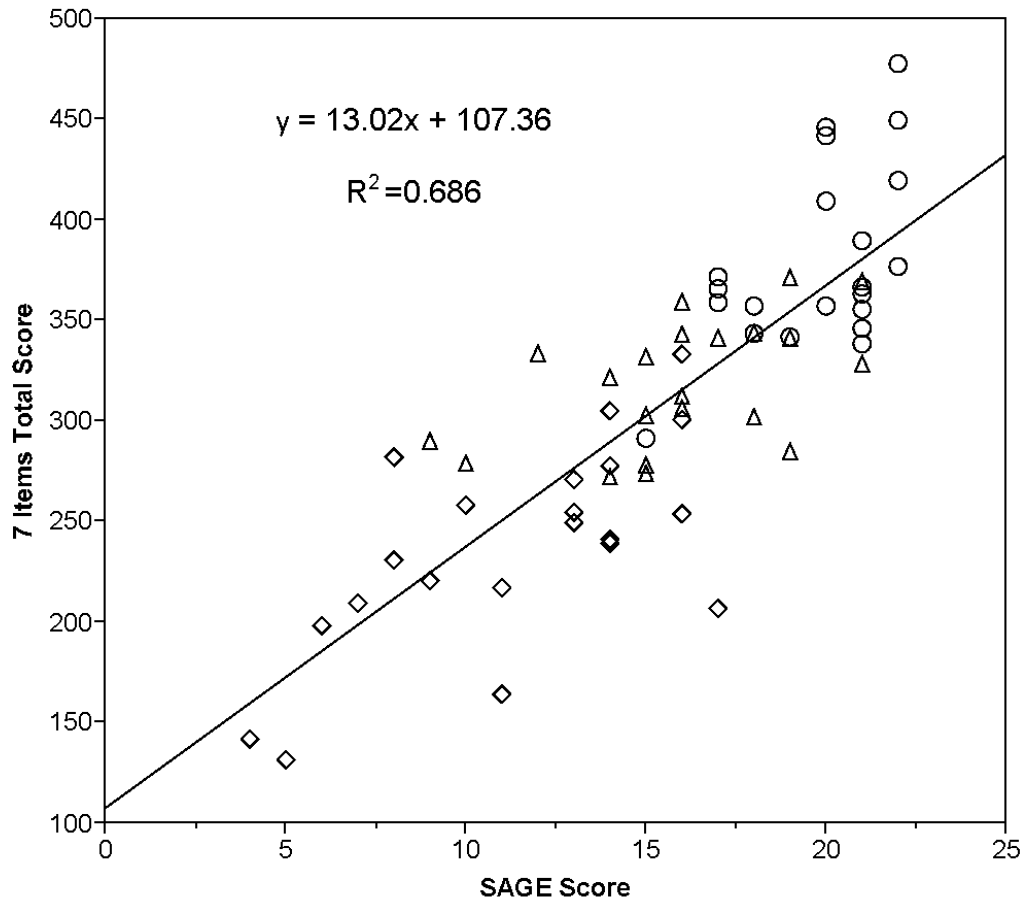


Figure 2. Neuropsychological testing (sum of 7 items) total score as a function of **Self Administered Gerocognitive Examination (SAGE)** score. Spearman correlation between SAGE and the total score of the 7 item neuropsychological battery was 0.84. Scharre et al. *Alzheimer Dis Assoc Disord* 2010;24:64-71  
 ○: normals (n=21); □: Mild Cognitive Impairment (n=21); ◇: dementia (n=21)

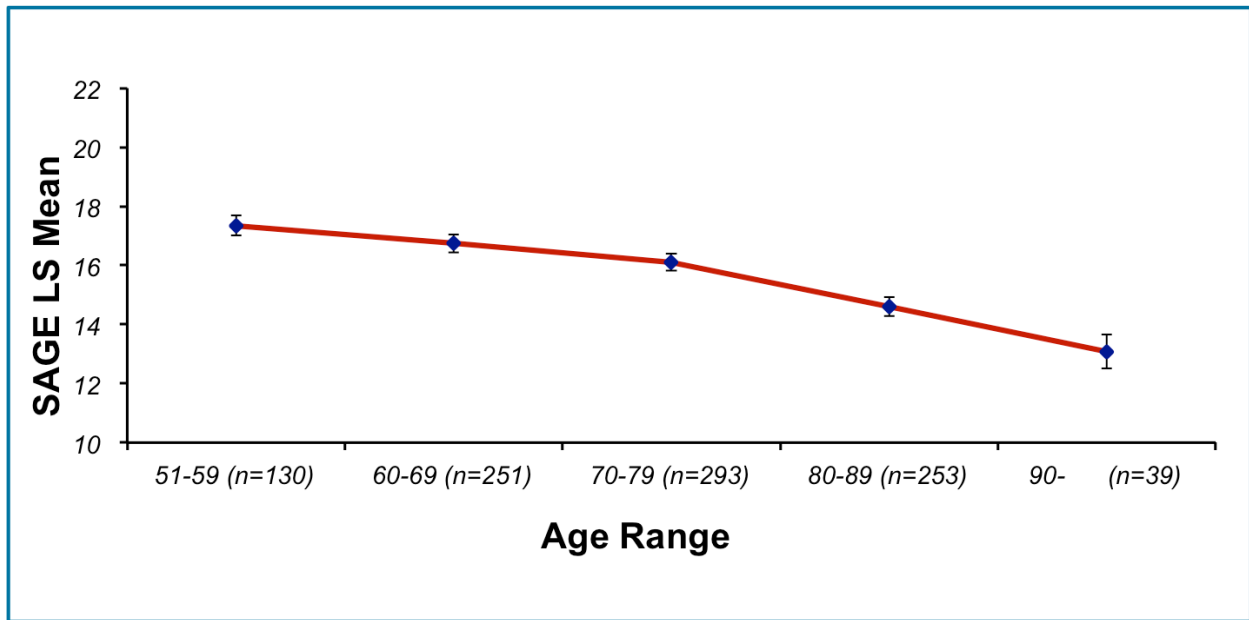


Figure 3: Age Effect on **Self Administered Gerocognitive Examination (SAGE)** Score. Higher age ( $F=28.17$ ;  $DF=4, 956$ ;  $P<0.0001$ ) was associated with lower total SAGE scores. We recommend that one point should be added to scores when age is over 80. Scharre et al. *J Neuropsychiatry Clin Neurosci* 2013 (In Press)

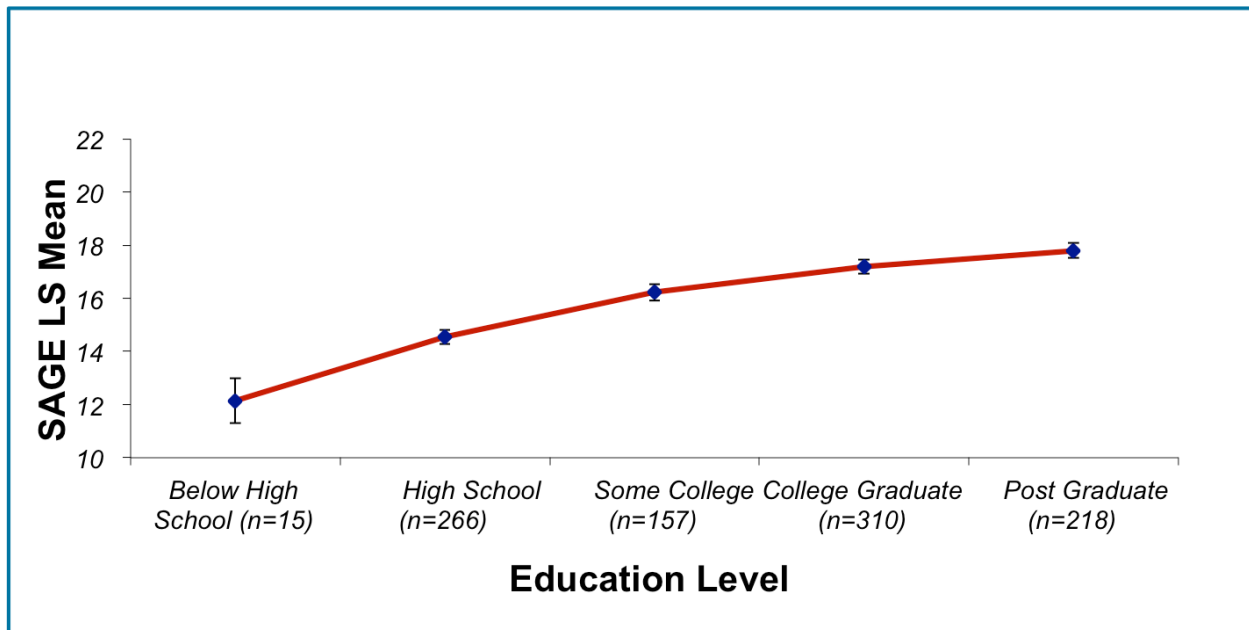


Figure 4: Education Effect on **Self Administered Gerocognitive Examination (SAGE)** Score. Lower education ( $F=43.06$ ;  $DF=4, 956$ ;  $P<0.0001$ ) was associated with lower total SAGE scores. We recommend that one point should be added to scores when education level is 12 years or less. Scharre et al. *J Neuropsychiatry Clin Neurosci* 2013 (In Press)

Table 3: **Self Administered Gerocognitive Examination (SAGE)** Domains: Correlations and Principal Component (PC) Analysis

SAGE Domain	Correlation to the total SAGE score	Weights for the first PC	Weights for the second PC
Language (max=4 points)	0.621	0.4876	-0.2314
Reasoning/computation (max=4 points)	0.622	0.3783	0.1993
Visuospatial (max=4 points)	0.701	0.5046	-0.2526
Executive (max=4 points)	0.798	0.4553	-0.0020
Memory (max=2 points)	0.611	0.3635	0.0571
Orientation (max=4 points)	0.295	0.1584	0.9163
Total Variation Explained by the Principal Component (PC)	-	42%	17%

The correlation data in Table 3 is consistent with the outcome of the Principal Component analysis with high and near equal correlations for the same 5 domains to the total SAGE score. Both indicate that SAGE is an internally consistent test that is very well balanced with language, reasoning/computation, visuospatial, executive, and memory domains each contributing equally and similarly to the variability of the data. It suggests that no single domain is over or under represented in the scoring of this test. The Cronbach's alpha for the 6 domains was 0.71. Scharre et al. *J Neuropsychiatry Clin Neurosci* 2013 (In Press)