

A TEST TO EVALUATE COGNITIVE IMPAIRMENT OF OLDER LATINO ADULTS.

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Abstract

Interest in determining the prevalence and incidence of dementia among older Latinos and tests of cognitive impairment that eliminate differences by educational level have been encouraged over the last decade. The *Cabán Mini-Mental* aims to measure the cognitive capacity of older Latinos and not discriminate against those with low education. It was developed in the Project "Health Conditions of Elderly Puerto Ricans" (*PREHCO*), a joint project between the University of Wisconsin-Madison and the School of Public Health of the University of Puerto Rico Medical Sciences Campus. Skills measured are: time orientation, visual-motor coordination, learning, recent memory and abstraction capacity. Specific test items are: date, drawings, repetition of words, folding of paper, and meaning of proverb. One hundred and ninety seven participants were administered the *Cabán* and *Folstein* minimentals to determine which one discriminated less by level of education. Results confirmed that the *Cabán* discriminated less by level of education than the *Folstein* even though results for both tests were similar.

CABAN MINIMENTAL: SPECIFIC ITEMS

1. Could you tell me today's date, day, month and year? [Value: 3 points]

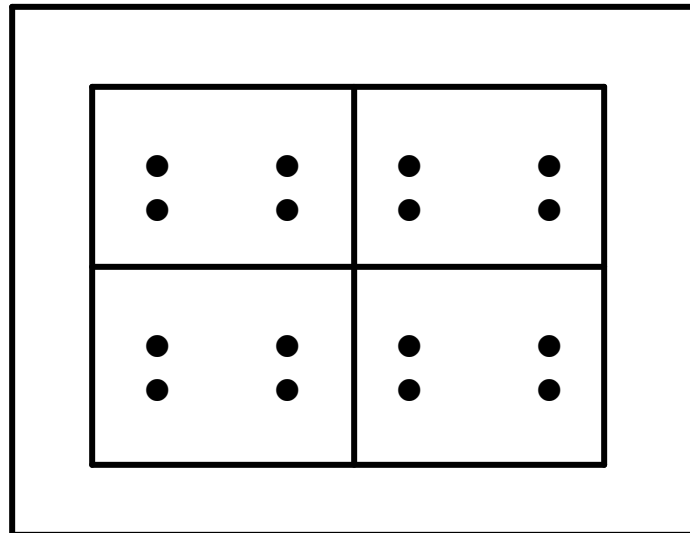
2. Please tell me what day of the week is today. [Value: 1 point]

3. Are you familiar with the clock? Please draw a clock with all the numbers for the different hours [Value: 1 point]

4. I am going to mention three words. Please repeat them after me. Listen carefully because at the end of this interview I will ask you to repeat them. **(Bell, clock, telephone)** [Value: 3 points]

CABAN MINIMENTAL: SPECIFIC ITEMS (cont.)

5. I am going to show you a drawing. Please observe it carefully. I will hide the drawing after 15 seconds and then I will ask you to draw what you remember. [Value: 4 points]

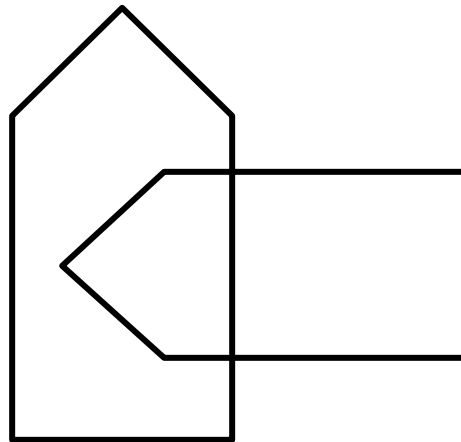


CABAN MINIMENTAL: SPECIFIC ITEMS (cont.)

6. I am going to hand you this paper. Take it in your hands, fold it in half and place it on your lap. [Value: 3 points]

7. I am going to show you a drawing and I want you to copy it. (Leave the drawing in front of the participant all the time that is necessary) [Value: 1 point]

FIGURE



CABAN MINIMENTAL: SPECIFIC ITEMS (cont.)

8. Please, repeat the three words that I mentioned at the beginning of the interview. It does not matter in what order you mention them. [Value: 3 points]

9. What do you understand by the proverb ____ ? : Mention a popular proverb [Value: 1 point]

TABLE 1: Description of Cabán Minimental

Cabán Mini Mental (Total Score: 20 points)			
Question	Description	Skill	Score
1	Day, month and year	Orientation	3
2	Specific day of week	Orientation	1
3	Drawing: clock with numbers in sequence	Memory and visual-motor coordination	1
4	Immediate repetition of words: bell, telephone & clock	Recent memory: retention	3
5	Drawing: Four quadrangles (show drawing for 15 seconds)	Memory or retention, attention and motor coordination	4
6	Fold paper in half and place on knees	Learning and following orders in sequence	3
7	Drawing: Intersecting pentagons (in front all the time)	Visual motor coordination	1
8	Repetition of words: bell, clock and telephone	Recent memory	3
9	Popular proverb	Abstraction	1

Table 2.CABAN MINIMENTAL: Score by Skill

Skill	Questions	Score
Orientation	1,2	4
Recent memory	3, 4, 5, 8	11
Visual motor coordination	3, 5, 7	6
Learning and following orders in sequence	6	3
Abstraction	9	1

Adjustments in score are considered for those participants that could not draw due to illness or physical limitation.

STAGES:

1. Validation process:

- 197 participants subjects; institutionalized and non-institutionalized.
- 24 %: mental health problem diagnosed by a geriatrician or psychiatrist
- Construct validity tests indicated a high correlation for several factors that confirmed consistency among items and for the different dimensions measured (time orientation, memory, visual-motor coordination, learning and following orders in sequence)
- Internal consistency: Cronbach's alpha 0.6801
- Best discriminating scores: 12-14

2. Comparison of Cabán minimal with Folstein (This presentation)

PARTICIPANTS: CHARACTERISTICS

TABLE 3: Participants (N=197): Mental Health Diagnosis

<u>Diagnosis</u>	<u>Frequency</u>	<u>Percent (%)</u>
No mental health problem	135	68.5
Alzheimer's	10	16.1
Alzheimer's with other condition	35	56.5
Depression	17	27.4

PARTICIPANTS: CHARACTERISTICS

TABLE 4: Demographic Characteristics (N=197)

Characteristic	Number	%
Education		
<6	75	38.1
6-9	55	27.9
10 or more	67	34.0
Knowledge		
Knows how to read	187	94.1
Knows how to write	187	94.1
Sex		
Female	64	32.5
Male	133	67.5
Residence		
Nursing home	160	81.2
Not in nursing home	37	18.8

ANALYSIS: ROC: CABAN MINIMENTAL SCORES BY MENTAL HEALTH PROBLEM DIAGNOSIS

Detailed report of Sensitivity and Specificity

Cut point	Sensitivity	Specificity	Correctly Classified	LR+	LR-
(>= -20)	100.00%	0.00%	31.47%	1.0000	
(>= -19)	100.00%	8.15%	37.06%	1.0887	0.0000
(>= -18)	90.32%	17.04%	40.10%	1.0887	0.5680
(>= -17)	85.48%	32.59%	49.24%	1.2682	0.4454
(>= -16)	80.65%	48.89%	58.88%	1.5778	0.3959
(>= -15)	72.58%	60.74%	64.47%	1.8488	0.4514
(>= -14)	67.74%	66.67%	67.01%	2.0323	0.4839
(>= -13)	59.68%	71.85%	68.02%	2.1201	0.5612
(>= -12)	54.84%	79.26%	71.57%	2.6440	0.5698
(>= -11)	53.23%	89.63%	78.17%	5.1325	0.5219
(>= -10)	45.16%	92.59%	77.66%	6.0968	0.5923
(>= -9)	40.32%	95.56%	78.17%	9.0726	0.6245
(>= -8)	29.03%	97.04%	75.63%	9.7984	0.7313
(>= -7)	17.74%	99.26%	73.60%	23.9515	0.8287
(>= -6)	9.68%	100.00%	71.57%		0.9032
(>= -5)	4.84%	100.00%	70.05%		0.9516
(>= -4)	3.23%	100.00%	69.54%		0.9677
(>= -2)	1.61%	100.00%	69.04%		0.9839
(> -2)	0.00%	100.00%	68.53%		

Obs 197 Area 0.7406 Std. Err. 0.0409 [95% CI] 0.66039- 0.82085

ANALYSIS: ROC: FOLSTEIN MINIMENTAL SCORES BY MENTAL HEALTH PROBLEM DIAGNOSIS

Detailed report of Sensitivity and Specificity

Cut point	Sensitivity	Specificity	Correctly Classified	LR+	LR-
(>= -14)	100.00%	0.00%	31.47%	1.0000	
(>= -13)	75.81%	33.33%	46.70%	1.1371	0.7258
(>= -12)	69.35%	51.85%	57.36%	1.4404	0.5910
(>= -11)	64.52%	65.93%	65.48%	1.8934	0.5382
(>= -10)	50.00%	71.11%	64.47%	1.7308	0.7031
(>= -9)	43.55%	79.26%	68.02%	2.0997	0.7122
(>= -8)	37.10%	85.19%	70.05%	2.5040	0.7384
(>= -7)	29.03%	90.37%	71.07%	3.0149	0.7853
(>= -6)	16.13%	92.59%	68.53%	2.1774	0.9058
(>= -5)	11.29%	98.52%	71.07%	7.6210	0.9004
(>= -4)	3.23%	99.26%	69.04%	4.3548	0.9750
(>= -3)	1.61%	99.26%	68.53%	2.1774	0.9912
(> -3)	0.00%	100.00%	68.53%		1.0000

Obs 197 Area 0.6442 Std. Err. 0.0441 [95% C I] 0.55771 - 0.73071

ROC AREA : CABAN MINIMENTAI BY SCHOOLING

Education	ROC		-Asymptotic Normal--		
	Obs	Area	Std. Err.	[95% Conf. Interval]	
<6	75	0.7967	0.0614	0.67627	0.91703
6-9	55	0.7365	0.0822	0.57537	0.89760
10 or +	67	0.7514	0.0639	0.62622	0.87655

Ho: area(1) = area(2) = area(3) chi2(2) = 0.43 **Prob>chi2 = 0.8064 (p>0.05)**

ROC AREA : FOLSTEIN MINIMENTAL BY SCHOOLING

Education	ROC		-Asymptotic Normal--		
	Obs	Area	Std. Err.	[95% Conf. Interval]	
<6	75	0.6577	0.0744	0.51195	0.80347
6-9	55	0.6914	0.0893	0.51641	0.86647
10 or +	67	0.7037	0.0652	0.57584	0.83157

Ho: area(1) = area(2) = area(3) chi2(2) = 0.22 **Prob>chi2 = 0.8950 (p>0.05)**

COMPARISON CABAN AND FOLSTEIN: by education

< sixth grade

	Obs	ROC Area	Std. Err.	-Asymptotic Normal-- [95% Conf. Interval]	
Cabán	75	0.7967	0.0614	0.67627	0.91703
Folstein	75	0.6577	0.0744	0.51195	0.80347

Ho: area(Cabán) = area(Folstein) chi2(1) = 4.33 Prob>chi2 = 0.0375					

Six to ninth grade

	Obs	ROC Area	Std. Err.	-Asymptotic Normal-- [95% Conf. Interval]	
Cabán	55	0.7365	0.0822	0.57537	0.89760
Folstein	55	0.6914	0.0893	0.51641	0.86647

Ho: area(Cabán) = area(Folstein) chi2(1) = 0.77 Prob>chi2 = 0.3798					

Tenth grade or more

	Obs	ROC Area	Std. Err.	-Asymptotic Normal-- [95% Conf. Interval]	
Cabán	67	0.7514	0.0639	0.62622	0.87655
Folstein	67	0.7037	0.0652	0.57584	0.83157

Ho: area(Cabán) = area(Folstein) chi2(1) = 0.42 Prob>chi2 = 0.5171					

Fig. 1. ROC Comparison Folstein and Cabán Scores

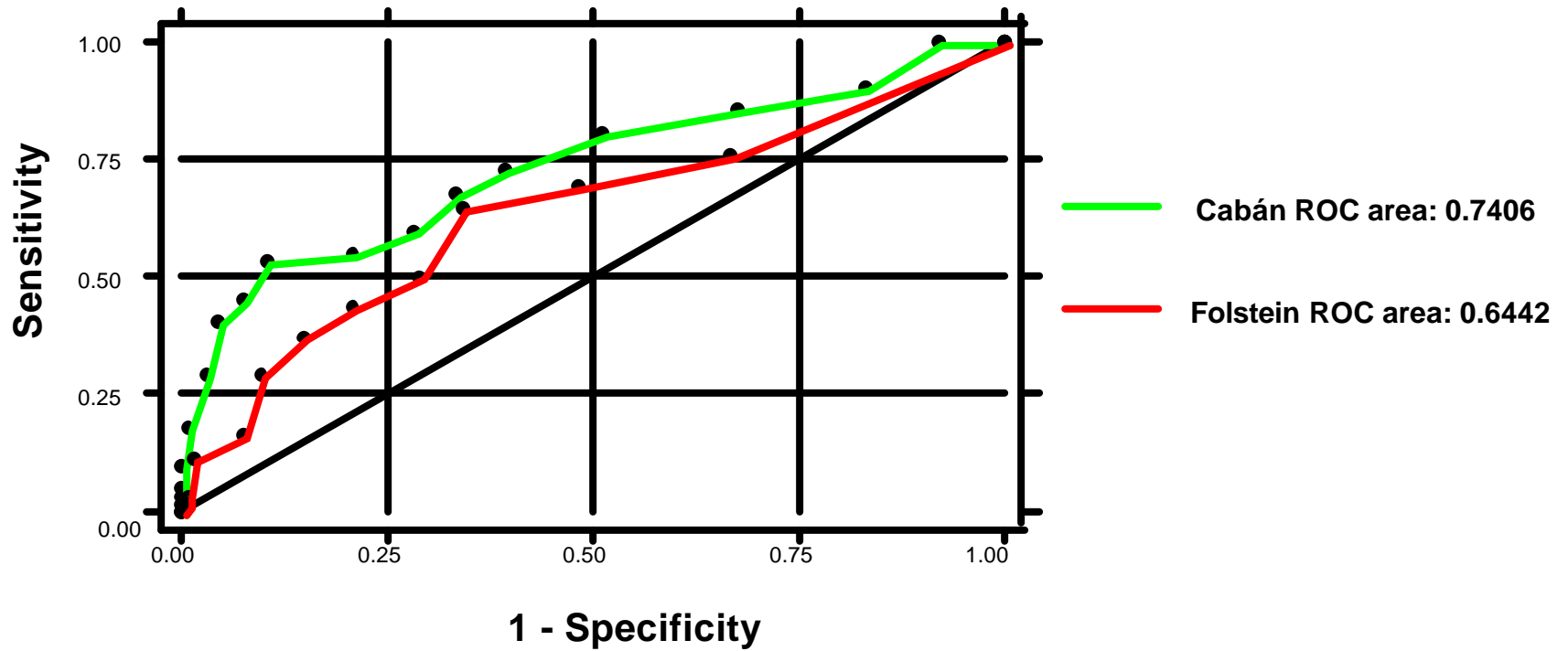
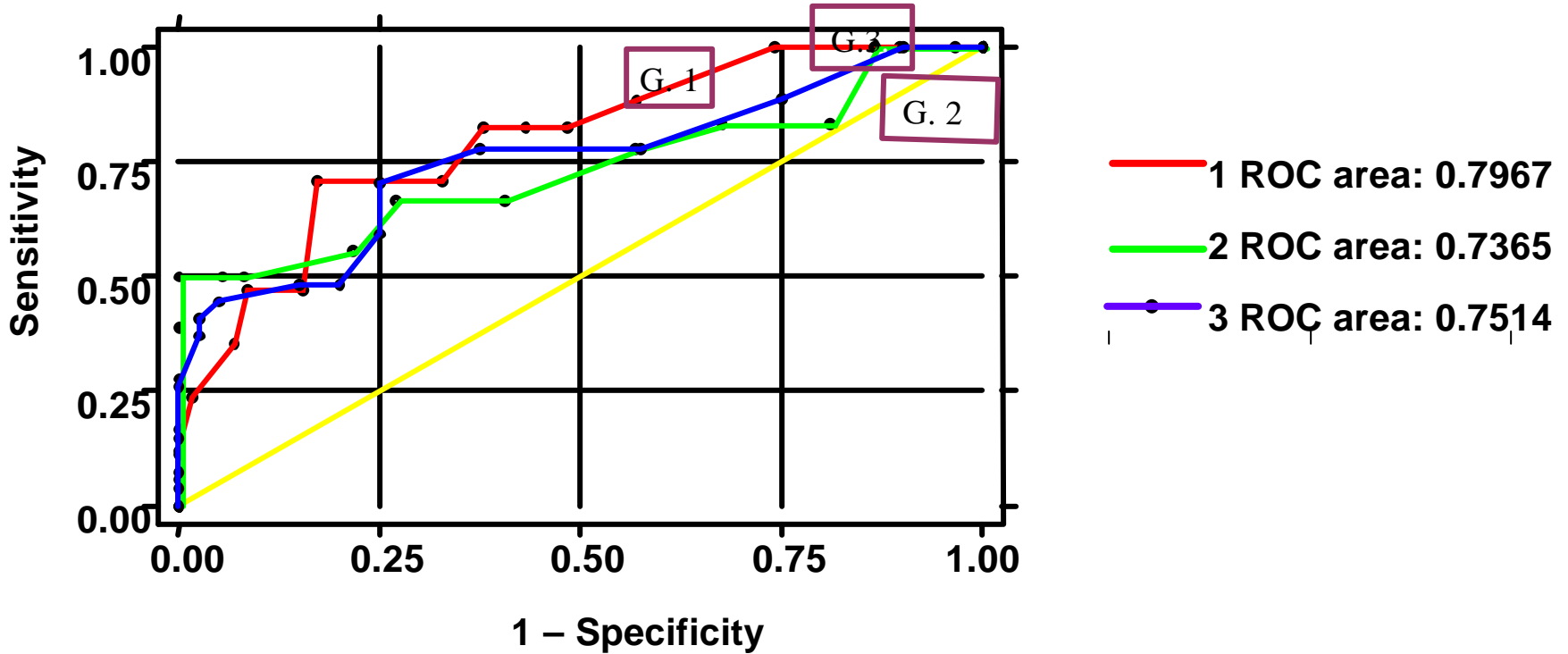
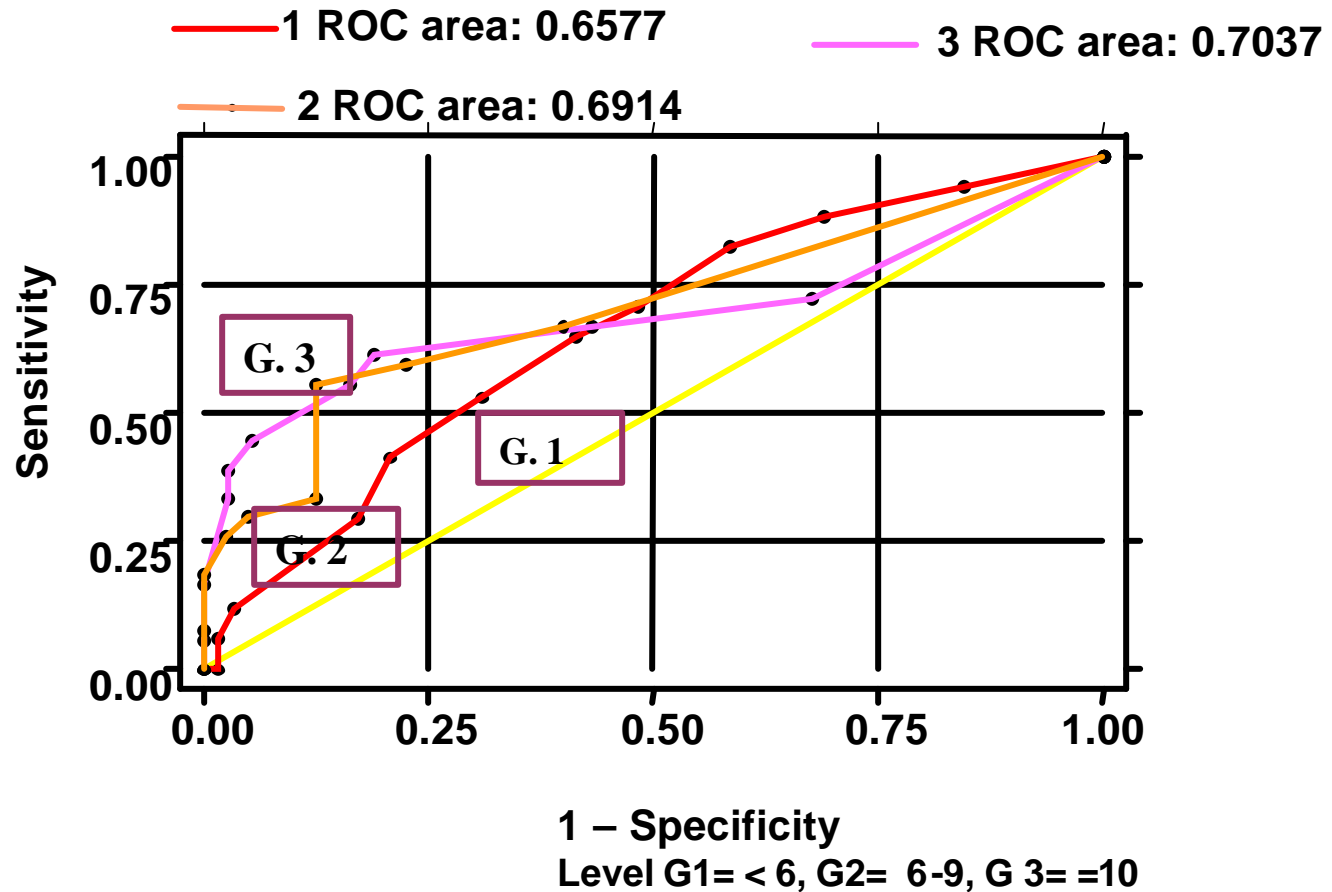


Fig. 2. ROC. Cabán Minimental by schooling.



Level G1= < 6, G2= 6-9, G 3= =10

Fig. 3. ROC. Folstein Minimental by schooling.



**Fig. 4. ROC. Comparison of Folstein and Cabán
by grade level <6**

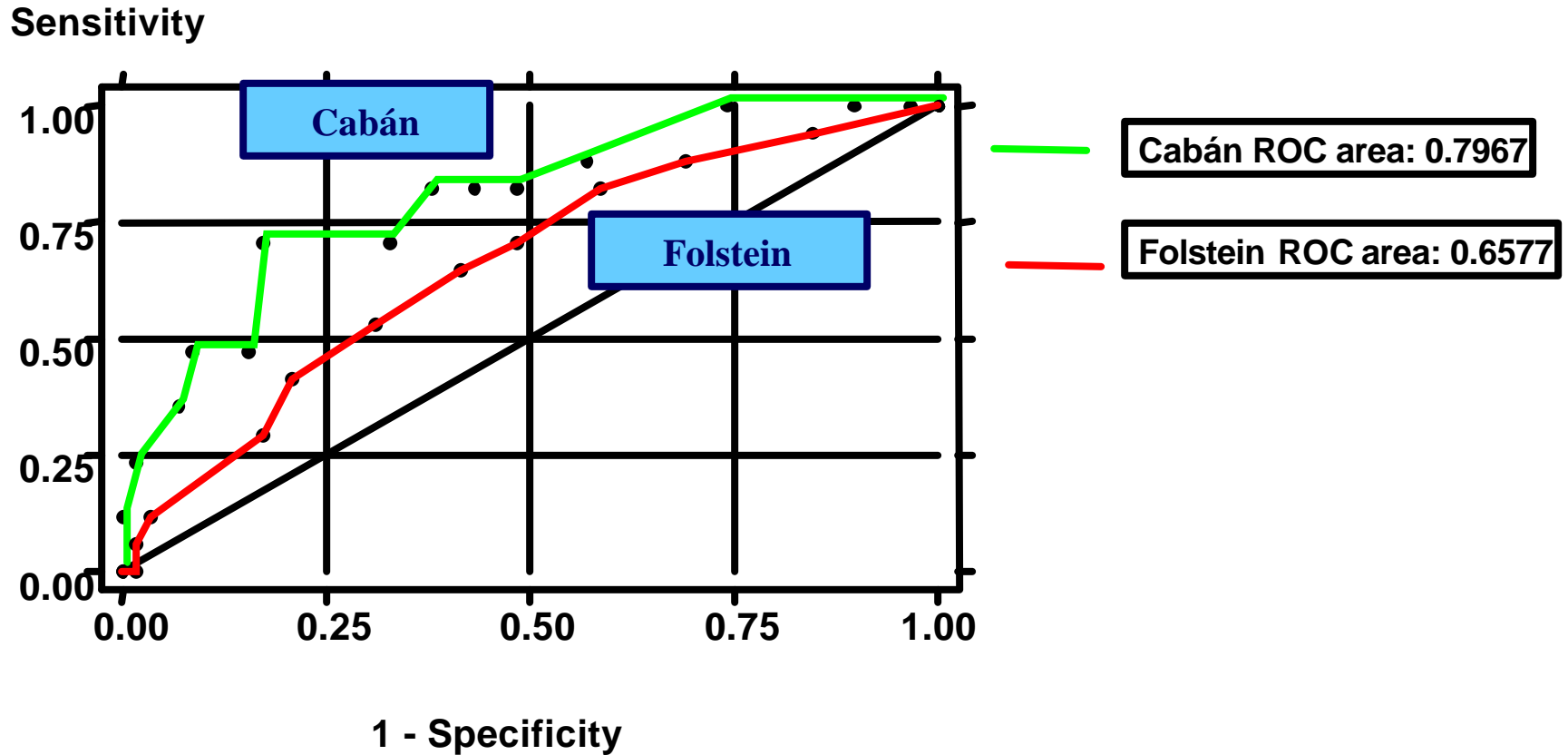


Fig. 5. ROC. Comparison of Folstein and Cabán by grade level 6-9

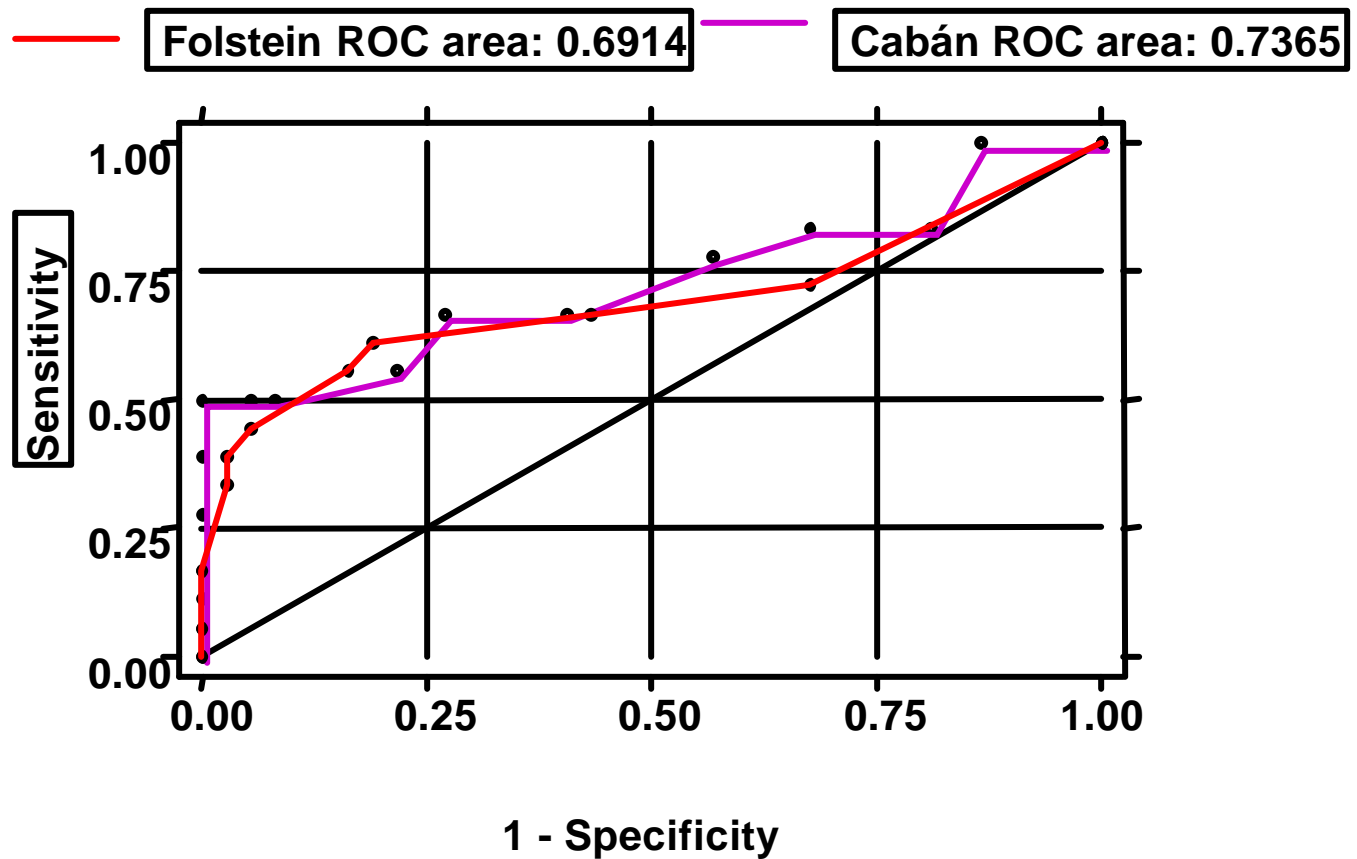
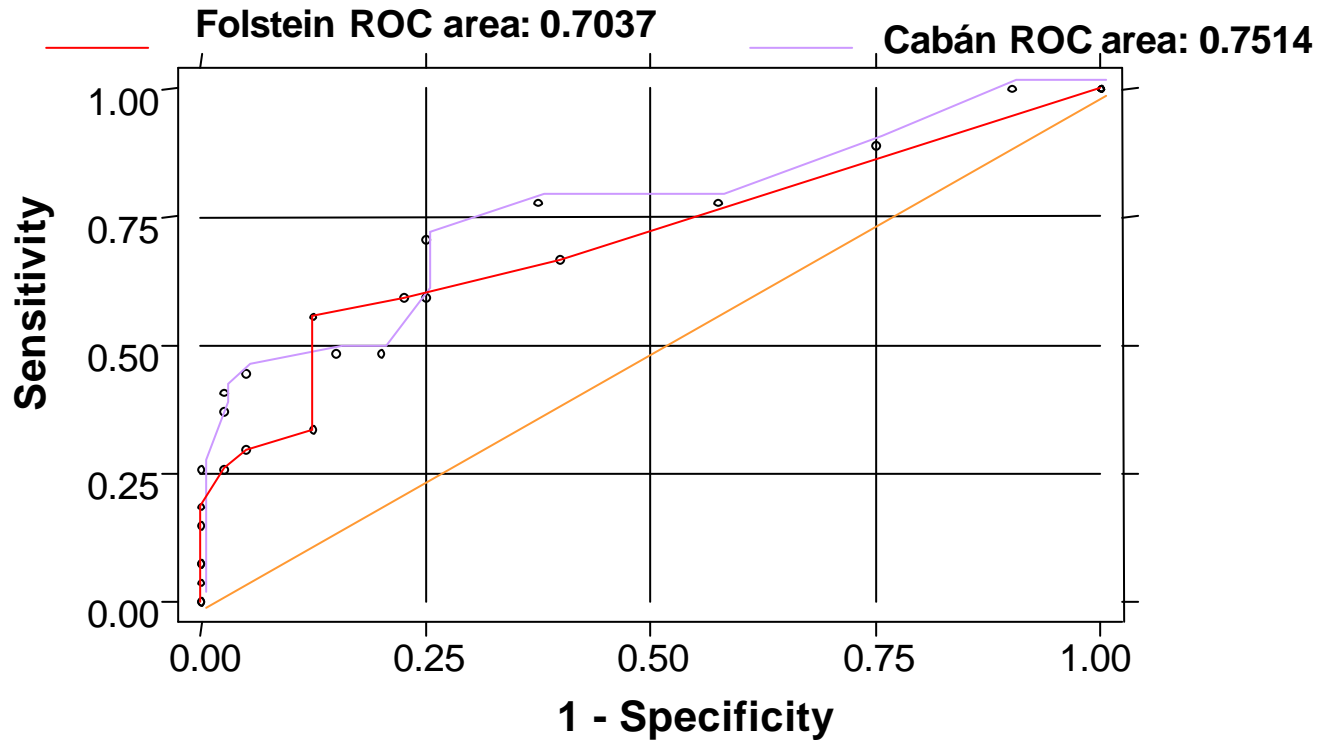


Fig. 6.ROC. Comparison of Folstein and Cabán by grade level 10 or more



Conclusions:

Both tests show a positive correlation. However, the *Cabán minimal* shows slightly better results (statistically significant) in terms of better discriminating by persons with a confirmed mental health problem. Results tend to indicate that the *Cabán* could discriminate less for those with lesser education; i.e., education would not be a significant factor in terms of score. Nonetheless, the sample used was small. This could be a hypothesis for a future comparison with a greater sample.