Exploring the Impact of Anxiety on Learning in the California Verbal Learning Test-2nd Edition

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Introduction & Hypotheses

It has been suggested that initial learning (e.g., trial 1) on the California Verbal Learning Test, 2nd Edition (CVLT-2) is associated with anxiety, not attentional capacity, with some patients learning fewer words on trial 1 as a result of increased anxiety related to ambiguity of the initial list presentation (Delis et al., 2000; Lezak, 1995). The present study sought to explore the theory around anxiety levels and learning on the CVLT-2.

The following hypotheses were made: (a) higher anxiety scores would be correlated with higher (steeper) Trial 1-2 Learning Slope scores; (b) anxiety and depression scores would be positively correlated; (c) Trial 1 raw scores would be not be correlated with longest digits forward of the Wechsler Adult Intelligence Scale III & IV.

Participants and Methods

Participants included 78 veterans who had been referred for neuropsychological evaluation (mean age = 59.1 [10.4]; mean education = 13.1 [2.9]).

Veterans completed a full testing battery to include the Beck Anxiety Inventory (BAI), the Beck Depression Inventory-II (BDI-II), WAIS-III or IV digit span subtest, and the CVLT-2. Only Veterans who passed the CVLT-2 forced choice and had average short delay retention or better were included in analyses.

Sample Characteristics (N = 78)

	%	M (SD)
Veteran Variables		
Age (years)		59.1 (10.4)
Race		
Black	18.9	
White	69.1	
All Other	10.3	
Education (years)		13.1 (2.9)

Bivariate Correlations

	Age	Education	BAIc	BDIc	LDF	Trial12LS	Trial25LS	LS1-5
Age	1	-	-	-	-	-	-	-
Education	0.034	1	-	-	-	-	-	-
BAIc	-.252*	0.067	1	-	-	-	-	-
BDIc	-.271*	0.086	.738**	1	-	-	-	-
LDF	-0.182	0.173	-0.027	0.134	1	-	-	-
Trial12LS	-0.024	-0.012	.227*	0.16	-0.007	1	-	-
Trial25LS	-0.156	.245*	-0.097	-0.04	0.172	-.227*	1	-
LS1-5	-0.049	-0.003	-0.101	-0.137	0.164	-0.125	0.018	1

Hierarchical Regression for Predicting Trials 1-2 Learning Slope

	Model 1			Model 2			Model 3		
Variable	B	SE B	β	B	SE B	β	B	SE B	β
Age	0	0.02	-0.02	0.01	0.02	0.04	0.01	0.02	0.04
Education	0.01	0.07	0.01	-0.01	0.07	0	-0.01	0.07	-0.01
BAI				0.03	0.02	-.24**	0.03	0.23	-2.94**
BDI							0	0.03	-0.01
R^2		0			0.05				0.05
F for change in R^2		0.02			4.12**				0

Results

As predicted, there were significant correlations between CVLT-2 Trial 1-2 LS and the BAI as well as the BAI and BDI-II. The correlations between WAIS digit span and CVLT-2 Trial 1 raw scores, Trial 2-5 LS and BAI scores, and Total Learning Slope and BAI scores were not significant. A hierarchical multiple regression was performed with age and education entered first, followed by BAI scores, and then BDI-II scores. Results indicated BAI scores predicted a significant amount of variance in Trial 1-2 LS scores above age and education, ΔR^2 =.05, F(1, 74)=.019, p<.05. Scores on the BDI-II did not predict a significant amount of variance above age, education and anxiety (p >0.05).

Conclusions

- BAI scores predicted a small but significant portion of the variance in Trials 1-2 Learning Slope scores.

- Although BDI-2 and BAI scores were highly correlated with each other, BDI-II scores did not contribute a significant portion of the variance in Trials 1-2 Learning Slope scores, after controlling for BAI scores. This suggests that anxious symptomology has a unique impact on initial learning of the CVLT-2.

- BAI scores were not correlated with Trials 2-5 LS or Total LS (trials 1-5). This provides some support for the assertion that the ambiguity of the first presentation of the list is particularly influenced by anxiety.

- Trial 1 scores were not correlated with WAIS III or WAIS IV LDF scores. This provides support for the assertion that Trial 1 of the CVLT-2 and digit span subtests are measuring two different cognitive processes; supraspan attention and focused attention, respectively.