SUPPLEMENTAL MATERIAL

Table S1. Correlation matrix for the five fluid processing tasks in the young (* $p<0.05$; ** $p<0.01$; *** $p<0.001$). After performing a principle component analysis, a single component was found with an eigenvalue exceeding 1. This component was used as a composite measure of *fluid processing ability* in subsequent analyses (Figures S3 and S4).

	Digit Symbol	**Dot Comparison**	**Verbal Fluency**	**Trails A**	**Trails B**
Digit Symbol	1.000				
Dot Comparison	0.390	1.000			
Verbal Fluency	0.260	0.321	1.000		
Trails A	-0.457*	-0.376	-0.477*	1.000	
Trails B	-0.345	-0.212	-0.498*	0.202	1.000
Shipley Vocabulary	-0.171	-0.022	0.076	0.032	-0.283

Figure S1. A dot plot of the mean of the null distribution of the classification accuracy for each subject. We repeated the neural specificity measure using the SVM approach 200 times while randomly permuting the category assignment or each subject. There was no difference between the age groups ($t(36)=1.081$, $p=0.144$, two-tailed).

Figure S2. A dot plot of neural specificity measured as the difference between the within-category correlation and between-category correlation of neural patterns. Neural specificity was higher in the younger adults than in the older adults although it did not reach statistical significance at the 0.05 level ($t(36)=1.474$, $p=0.075$).

Figure S3. Neural specificity of visual activity measured from the SVM approach and its behavioral correlates in the younger adults. Separate regression analyses were performed with each of the behavioral measures (including the composite measure of fluid processing ability) as the response and neural specificity of visual activity as the predictor while controlling for age. The results were as follows: dot-

comparison, β=66.915, t(16)=1.549, p=0.070; digit-symbol, β=59.566, t(16)=1.207, p=0.123; verbal-fluency, β=-7.779, t(16)=-0.197, p=0.577; Trails-A, β=-63.091, t(16)=-0.134, p=0.493; Trails-B, β=-85.707, t(16)=-0.761, p=0.229; Shipley-vocabulary, β=-21.125, t(16)=-1.493, p=0.923; fluid processing ability, β=9.2231, t(16)=1.232, p=0.118. The scatter plots show simple linear relationships between neural specificity and each behavioral measure and zero-order correlations are reported. In addition, semipartial (or part) correlations are reported to illustrate the unique contribution of neural specificity in predicting each behavioral measure controlling for age. Each data point represents a single younger adult.

Figure S4. Neural specificity of visual activity measured from the correlation approach and its behavioral correlates in the younger adults. Separate regression analyses were performed with each of the behavioral measures (including the composite measure of fluid processing ability) as the response and neural specificity of visual activity as the predictor while controlling for age. The results were as follows: dot-comparison, β=11.960, t(16)=1.423, p=0.087; digit-symbol, β=-2.721, t(16)=-0.275, p=0.606; verbal-fluency, β=14.635, t(16)=2.193, p=0.022; Trails-A, β=2.995, t(16)=0.273, p=0.606; Trails-B, β=-23.412, t(16)=-1.101, p=0.144; Shipley-vocabulary, β=-2.643, t(16)=-0.934, p=0.818; fluid processing ability, β=1.614, t(16)=1.111, p=0.142. Notational conventions are the same as in Figure S3.

Figure S1

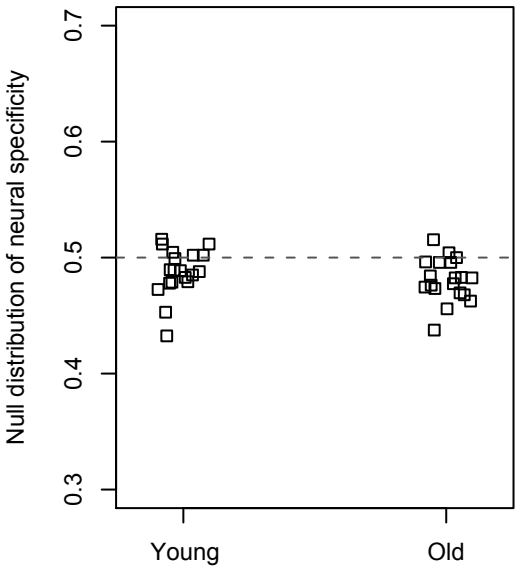

Null distribution of neural specificity
0.3
0.4
0.5
0.6
0.7
Young
Old

Figure S2

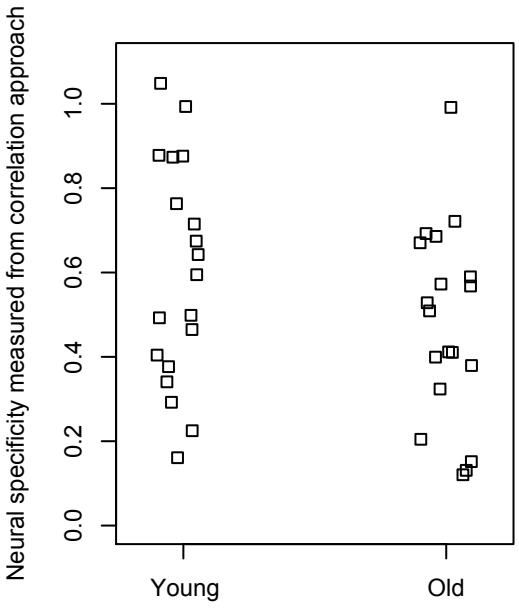

Neural specificity measured from correlation approach
0.0
0.2
0.4
0.6
0.8
1.0
Young
Old

Figure S3

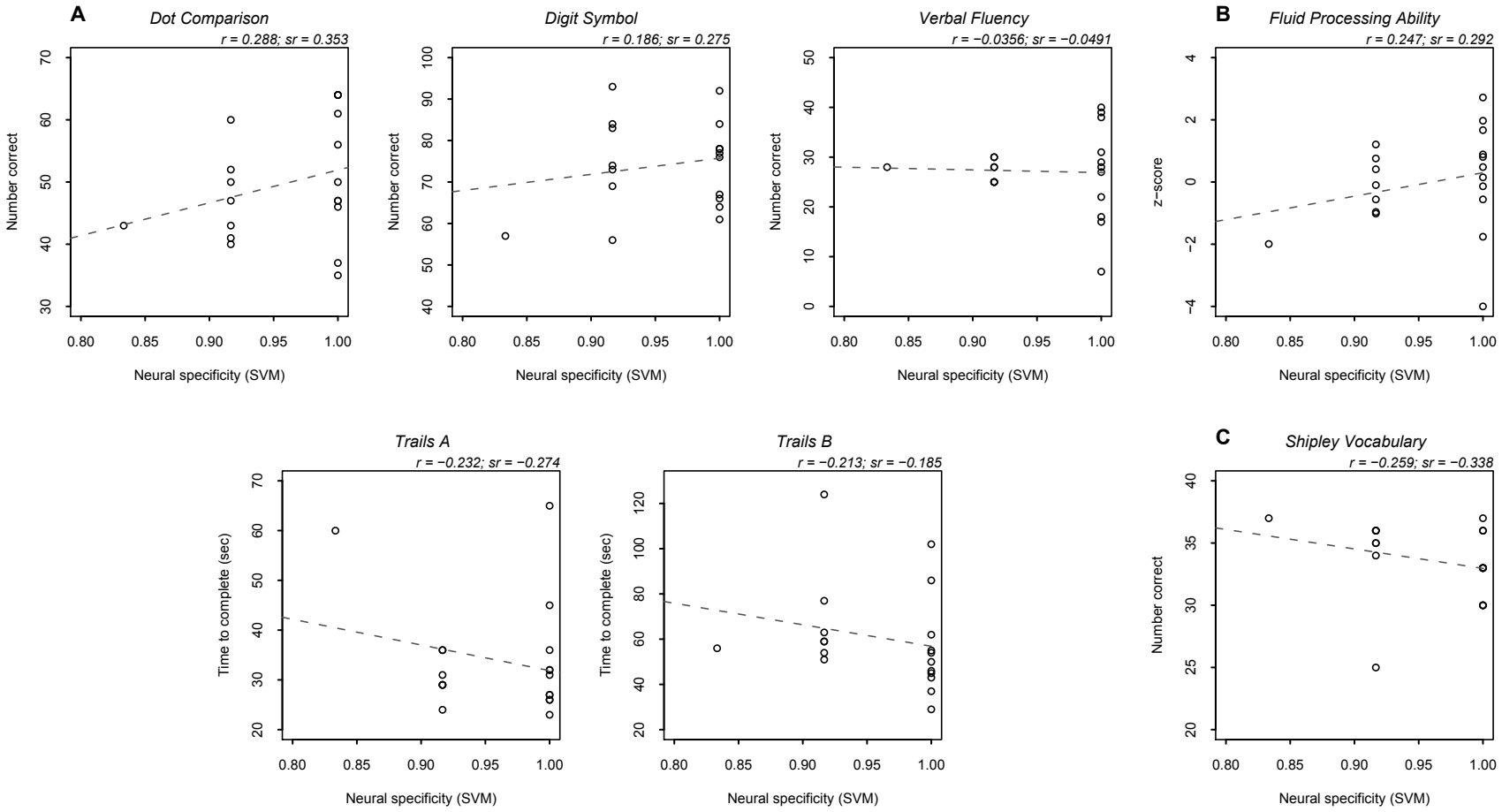
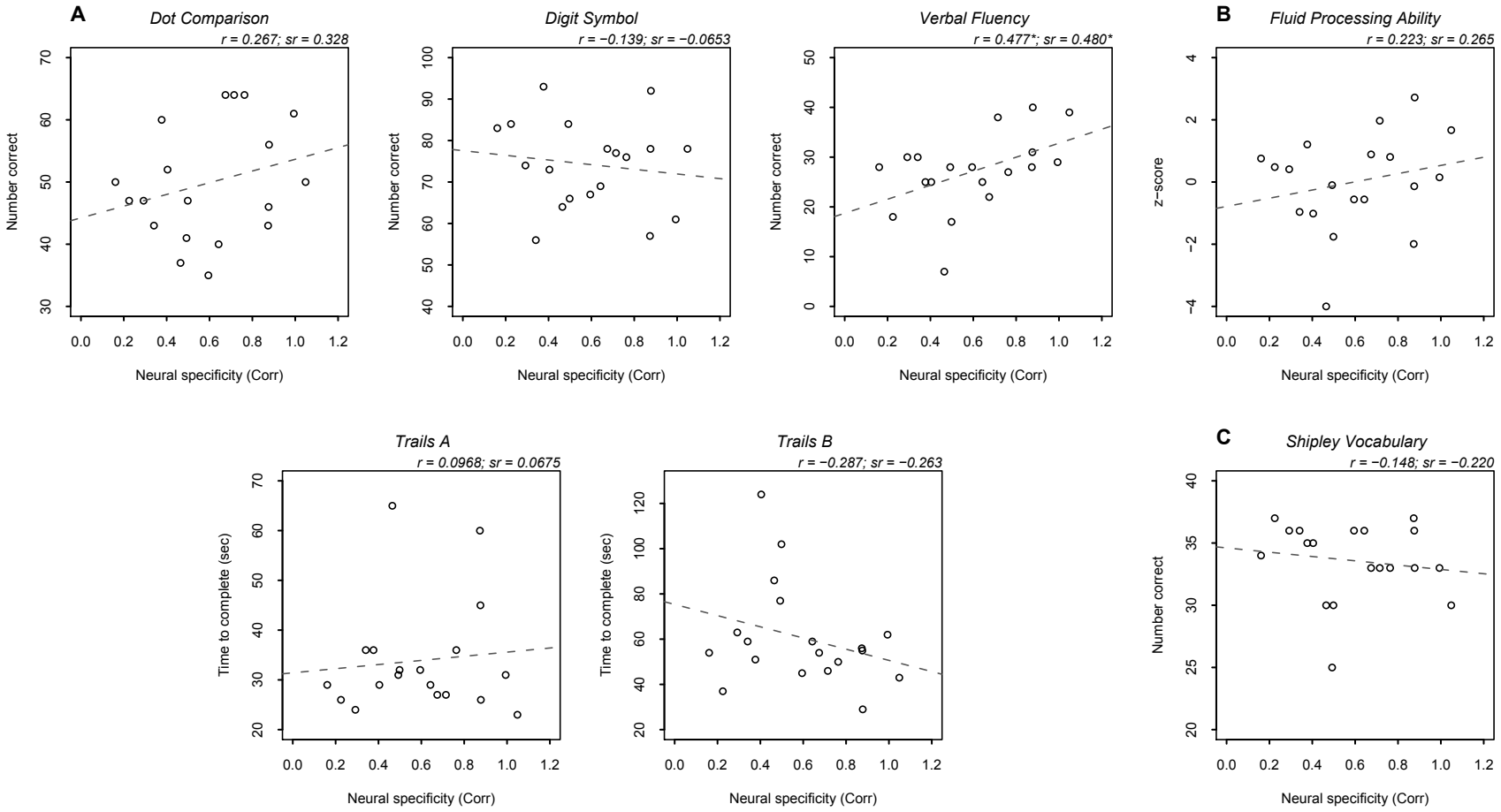

A
Dot Comparison
r = 0.288; sr = 0.353
Number correct
Neural specificity (SVM)
Digit Symbol
r = 0.186; sr = 0.275
Number correct
Neural specificity (SVM)
Verbal Fluency
r = −0.0356; sr = −0.0491
Number correct
Neural specificity (SVM)
B
Fluid Processing Ability
r = 0.247; sr = 0.292
z−score
Neural specificity (SVM)
Trails A
r = −0.232; sr = −0.274
Time to complete (sec)
Neural specificity (SVM)
Trails B
r = −0.213; sr = −0.185
Time to complete (sec)
Neural specificity (SVM)
C
Shipley Vocabulary
r = −0.259; sr = −0.338
Number correct
Neural specificity (SVM)

Figure S4


A
Dot Comparison
r = 0.267; sr = 0.328
Number correct
Neural specificity (Corr)
Digit Symbol
r = −0.139; sr = −0.0653
Number correct
Neural specificity (Corr)
Verbal Fluency
r = 0.477*; sr = 0.480*
Number correct
Neural specificity (Corr)
B
Fluid Processing Ability
r = 0.223; sr = 0.265
z−score
Neural specificity (Corr)
Trails A
r = 0.0968; sr = 0.0675
Time to complete (sec)
Neural specificity (Corr)
Trails B
r = −0.287; sr = −0.263
Time to complete (sec)
Neural specificity (Corr)
C
Shipley Vocabulary
r = −0.148; sr = −0.220
Number correct
Neural specificity (Corr)