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# **Validation of the Adult Version of the American Speech-Language-Hearing Association's Functional Communication Measures**

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## Abstract

The American Speech-Language-Hearing Association's Functional Communication Measures (FCMs) were designed as a method for evaluating the quality and value of care provided by its members. The measures used are eleven separate single-item measures of the following constructs:

FCM A: Motor Speech
FCM B: Voice
FCM C: Fluency
FCM D: Swallowing
FCM E: Spoken Language Comprehension
FCM F: Spoken Language Expression
FCM G: Writing
FCM H: Reading
FCM I: Attention
FCM J: Memory
FCM K: Pragmatics

Two dataset were used to evaluate the psychometric quality of the FCMs. Study 1 was a reliability study that compared the ratings of 17 vignettes by 1648 speech pathologists to a gold standard (expert panel ratings). Study 2 was a set of ongoing evaluations of treated clients that included baseline and follow-up pathologists' evaluations (as assessed by the FCMs), and consumers' ratings of satisfaction. The results of the reliability analysis showed strong support for the convergence between the pathologists' ratings and the gold standard, as virtually all pathologists scored within a single point of the gold standard on all domains. The correlational analysis found some evidence of convergent, discriminant, and construct validity of the FCMs and the consumer's satisfaction rating. Although the consumer's satisfaction ratings appear to be reliable, there remain some questions about the construct validity of the measures, particularly as it relates to the subjects attention to the details of the questions. The null relationship between the FCMs and the consumer satisfaction should therefore be interpreted cautiously.

## Validation of the American Speech-Language-Hearing Association's Functional Communication Measures

### INTRODUCTION

The National Outcomes Measurement System (NOMS) was designed to evaluate the overall effectiveness of speech and hearing interventions. In an effort to provide an objective method for evaluating the effectiveness of speech and hearing interventions, the National Association for Communication Disorders designed a set of functional communication measures (FCMs) aimed at assessing change produced by these treatments. Because of inherent differences between speech and hearing problems and their expected effects, several different FCMs were designed to assess different problems. Our earlier analysis of the K-6 versions of the instruments produced positive psychometric evidence in support of the instrument. However, because of the relatively small sample used, we were not able to analyze all eleven FCMs. The sample of adults having completed treatment is much larger, and we were therefore expected to be able to evaluate all eleven FCMs.

As described in the K-6 version of the report, an FCM is a single item measure that assesses the extent to which a patient is impaired with regard to a specific aspect of communication. Eleven FCMs were used in the current study, and they concerned the following aspects of communication:

FCM A: Motor Speech
FCM B: Voice
FCM C: Fluency
FCM D: Swallowing
FCM E: Spoken Language Comprehension
FCM F: Spoken Language Expression
FCM G: Writing
FCM H: Reading
FCM I: Attention
FCM J: Memory
FCM K: Pragmatics

Each FCM contains seven discrete levels, which range from low to high in functionality. Trained speech pathologists evaluate the patient using the relevant FCMs at intake and again at outcome.

Because pathologists administer the FCMs, there is some concern for self-serving bias, which may be manifested as a positive skew in the empirical results. There is also some indication that pathologists have difficulty agreeing on assigned levels near the middle of the seven-point scale. For this reason, it is necessary to conduct a comprehensive psychometric evaluation that includes an assessment of random and systematic measurement error in each of the FCMs.

The NOMS protocol implemented an assessment that attempts to evaluate the utility of the speech and hearing interventions. In addition to the FCMs, which were used by trained speech pathologists, the system included a set of indicators that measures patients' satisfaction with the therapy. The satisfaction measures may provide a basis for evaluating the impact of self-serving bias.

This report examines some of the psychometric issues underlying the FCMs and their use in a clinical population. Because the analysis is based on previously collected data, we cannot comprehensively address all psychometric issues, but we can move toward creating a compelling critical mass of empirical evidence with which to provide a level of confidence in using the measures. However, we also expect that ongoing psychometric evaluation will be needed.

## METHOD

### Study 1

The first study attempts to validate the FCMs through a test of the correspondence between the FCM scores of a series of hypothetical vignettes and the scores provided by a panel of expert speech pathologists. We regard this correspondence to be largely associated with establishing the reliability of the FCM and not as much for the measures validity.

### Study 2

A second dataset contains a large number of NOMS reports used as a normal part of treatment taken directly from the files. Unfortunately, unlike the K-6 dataset that contains separate measures of change and/or satisfaction for children's parents and teachers, the adult dataset contains only a consumer satisfaction measure taken directly from the patient at the end of treatment. The lack of alternative measures limits our ability to evaluate construct validity.

## Measures

**Study 1.** The first study was designed to assess the correspondence between subjects' ratings of the hypothetical patients and rating provided by a committee of trained professionals rating those same hypothetical cases. Two sets of measures were used in this study:

**Hypothetical Vignettes.** The first study evaluated the reliability of the FCM by comparing ratings of 17 hypothetical vignettes to a "gold standard" evaluation score by a committee of trained professionals. The 17 vignettes described the speech communication problems associated with different hypothetical adult patients. Each vignette consisted of a paragraph of text that was oriented toward a specific FCM. The eleven FCMs were used to score the vignettes.

**Functional Communication Measures (FCMs).** The FCMs are single-item measures developed to describe different aspects of a patient's functional communication ability. The eleven FCM domains used in this study were: FCM A: Motor Speech, FCM B: Voice, FCM C: Fluency, FCM D: Swallowing, FCM E: Spoken Language Comprehension, FCM F: Spoken Language Expression, FCM G: Writing, FCM H: Reading, FCM I: Attention, FCM J: Memory, FCM K: Pragmatics.

Not all FCM domains were scored for each patient. Only those that were relevant to a patient's particular disability were scored. Each FCM contains a unique 7-point scale ranging from least functional (level 1) to most functional (level 7). Within the domains, each point on the 1-7 scale describes the relevant activities and to what extent patients must be able to perform them in order to be classified at that level. When used multiple times, FCMs can be used to assess change in patient's abilities over time by computing difference scores.

**Study 2.** The validity study used two different methods for assessing the effectiveness of the treatments: FCMs (which were rated by the speech pathologists; presented above), and a separate consumer satisfaction measure. The consumer satisfaction measures are described below.

**Consumer Ratings of Satisfaction.** The Consumer Survey assesses the patient's satisfaction at the end of treatment using the following questions, rating each on a scale ranging from strongly agree (1) to strongly disagree (5).

**A: Overall Satisfaction:** Overall, the speech-language pathology program services were satisfactory.

**B: Perceived Improvement:** I believe that my communication and/or swallowing improved because of the speech-language pathology services.

**C: Family involvement:** My family or other people important to me were included in my services.

**D: Pathologist communication:** My speech-language pathologist did a good job answering the questions I had about my problem.

**E: Pathologist respect.** My speech-language pathologist treated me with dignity and respect.

## RESULTS AND DISCUSSION

### Descriptive Statistics

In the initial stage of the analysis we consider the distributions of the measures in order to understand the basic central tendency and dispersion of the measures when used in the testing environment.

Table 1 presents the means and standard deviations for the eleven FCMs at baseline and at the end of treatment, along with the means and standard deviations for the five consumer satisfaction measures given at the end of treatment.

**Functional Communication Measures.** The means for all eleven domains are higher than the standard deviations, indicating the lack of a substantial amount of skewness in the distributions. However, most are also on the high side of the middle of the scale even at baseline, which may be indicative of a slight positivity bias. Only the writing domain produces a value less than 3.0. The means and standard deviations at treatment close are also above the middle of the scale and the means are also higher than the standard deviations. Means at treatment end are also consistently higher than baseline.

Table 1. Descriptive Statistics for FCMs and Consumers' Satisfaction Ratings				
Item	Time 1		Time 2	
	M	SD	M	SD
<b>Functional Communication Measures</b>				
FCM A: Motor Speech	3.76	1.46	4.99	1.61
FCM B: Voice	3.22	1.31	4.84	1.59
FCM C: Fluency	3.60	1.50	4.97	1.62
FCM D: Swallowing	3.08	1.59	4.50	1.91
FCM E: Spoken Language Comprehension	3.31	1.48	4.52	1.65
FCM F: Spoken Language Expression	3.19	1.48	4.35	1.71
FCM G: Writing	2.86	1.41	4.01	1.65
FCM H: Reading	3.53	1.44	4.70	1.50
FCM I: Attention	3.37	1.31	4.65	1.43
FCM J: Memory	3.47	1.26	4.65	1.42
FCM K: Pragmatics	3.35	1.31	4.85	1.42
<b>Consumer Satisfaction</b>				
A: Overall Satisfaction	-	-	4.50	0.96
B: Perceived Improvement	-	-	4.09	1.43
C: Family Involvement	-	-	3.67	1.80
D: Pathologist Communication	-	-	4.47	1.08
E: Pathologist Respect	-	-	4.67	0.87

**Customer's Satisfaction Ratings.** The consumer satisfaction measures are all at the highest end of the response scale. This left skew in the data indicates a positivity bias, similar to that seen in the FCM measures. However, the satisfaction bias is probably not caused by the same type of self-serving concerns as the FCM. The general pattern suggests the possibility that respondents are not carefully considering the answers and may be instead the result of a relatively careless or knee-jerk response that threatens construct validity. We should note that most satisfaction measures suffer from this same type of skew.

### Study 1: Reliability of Speech Pathologists' Ratings

We tested validity of the FCMs by comparing the scoring of 17 hypothetical vignettes from 1648 trained professionals to a gold standard scoring provided by a committee of professionals.

Table 2 presents the count and percentages of professionals whose ratings matched the gold standard and who missed the gold-standard by a single point. The vast majority of the 1648 speech pathologists matched the gold standard on all 18 vignettes. All but four of the vignettes produced rates of agreement with the gold standard exceeding 90 percent, and the remaining four produced agreement rates exceeding 80 percent. Virtually all of the speech pathologists scored the vignettes within one point of the gold standard.

Table 2. Descriptive Statistics for Vignette Difference Scores (Rating - Correct Answer).

Vignette	Number Correct	Percent Correct	Number Within One Point of the Correct Answer	Percent Within One Point of the Correct Answer
1	1401	85.01	247	100.00
2	1575	96.54	67	99.64
3	1361	82.58	273	99.15
4	1466	88.96	150	98.06
5	1573	95.45	65	99.39
6	1626	98.67	18	99.76
7	1596	96.84	43	99.45
8	1621	98.36	14	99.21
9	1633	99.09	6	99.45
10	1599	97.03	40	99.45
11	1460	88.59	165	98.60
12	1555	94.36	78	99.09
13	1538	93.33	99	99.33
14	1568	95.15	71	99.45
15	1426	86.53	210	99.27
16	1608	97.57	22	98.90
17	1623	98.48	13	99.27

These results suggest that the FCM criteria can be applied to the theoretical patient with an extremely high degree of agreement with a gold standard and with other speech pathologists. This pattern would seem to rule out a high degree of random slippage in the system indicating a high degree of reliability in the instruments.

### Study 2: Validity of Speech Pathologists' Ratings

We examined some elements of the construct validity of the speech pathologists' ratings by considering the distributions of change across a population of patients currently being treated for communication disorders. The means and standard deviation of the change from baseline to end of treatment presented in Table 3 suggest that speech pathologists on average see a positive change by the end of treatment. On the surface this might suggest a slight positive bias in the responses; however, the fact that the results appear to be normally distributed around these means also suggest that a substantial number of the speech pathologists do in fact report negative change.

The *d* scores presented in the last column of the table provide evidence of a robust level of change from baseline to end of treatment. In all but one case, the change from baseline was greater than the standard deviation. Analysis of the distribution of the changes showed that speech pathologists reported zero or negative change for 22 percent for motor speech, 22 percent for voice, 24 percent for fluency, 33 percent for swallowing, 26 percent for spoken language comprehension, 27 percent for spoken language expression, 29 percent for writing, 27 percent for reading, 23 percent for

attention, 25 percent for memory, and 20 percent for pragmatics. This pattern of zero and negative change suggests that speech pathologists are capable of reporting failures in their treatment when it appears.

Table 3. Means and Standard Deviations of Pathologists' Difference Scores.			
FCM	Endpoint-Baseline		
	M	SD	<i>d</i>
FCM A: Motor Speech	1.23	1.12	1.10
FCM B: Voice	1.63	1.47	1.11
FCM C: Fluency	1.38	1.38	1.00
FCM D: Swallowing	1.41	1.65	0.85
FCM E: Spoken Language Comprehension	1.23	1.17	1.05
FCM F: Spoken Language Expression	1.18	1.14	1.04
FCM G: Writing	1.18	1.14	1.04
FCM H: Reading	1.18	1.06	1.11
FCM I: Attention	1.29	1.11	1.16
FCM J: Memory	1.19	1.04	1.14
FCM K: Pragmatics	1.52	1.27	1.20
Note. Positive difference scores indicate improvement in functionality over the study period. The <i>d</i> symbol indicates a difference score expressing the change in terms of a fraction of a standard deviation.			

### *Convergent and Discriminant Validity*

Table 4 presents the bivariate correlations among the seven FCM scores. Because most of the FCMs are used with different types of communication problems, they are not frequently used in the same patients. There are some exceptions, and these cases provide a method of showing that the pathologists' ratings are not affected by some general industry bias that simply shows improvement across all domains. At the same time, all of the domains can be considered subsumed under an umbrella of communication constructs. Therefore, it stands to reason that the intercorrelations among the domains should show a pattern of low to moderate correlations, and that excessively high intercorrelations may threaten the discriminant validity of the measures.

Not all domains are used with all patients, and many patients are rated on one or two. However, the extremely large sample used in this analysis allows us to estimate correlations for all domains even the rare combinations. Taken together, these correlations show the adult version of the FCM to be directed at a cohesive collection of communication problems.



Table 4. Intercorrelations among the FCM Change Scores.

	A	B	C	D	E	F	G	H	I	J	K
FCM A: Motor Speech	1										
FCM B: Voice	0.63	1									
FCM C: Fluency	0.71	0.57	1								
FCM D: Swallowing	0.51	0.52	0.39	1							
FCM E: Spoken Comp.	0.62	0.56	0.66	0.49	1						
FCM F: Spoken Expres.	0.71	0.61	0.59	0.49	0.74	1					
FCM G: Writing	0.47	0.42	0.49	0.34	0.53	0.58	1				
FCM H: Reading	0.48	0.39	0.51	0.38	0.63	0.61	0.66	1			
FCM I: Attention	0.57	0.56	0.17	0.48	0.68	0.66	0.59	0.64	1		
FCM J: Memory	0.52	0.44	0.45	0.42	0.65	0.61	0.56	0.60	0.72	1	
FCM K: Pragmatics	0.61	0.51	0.34	0.46	0.71	0.69	0.64	0.63	0.74	0.70	1

Note: All correlation except those in the shaded cell are statistically significant at the .0001 level.

### Construct Validity

The limited number of criterion measures provided in our datasets do not permit an extensive evaluation of the ability of the FCM to converge with other methods of measuring functional disabilities. Consumer's satisfaction was assessed with a series of questions about the adequacy of treatment reported by the patients at the end of treatment.

**Factor Analysis.** We first considered the structural validity of the five satisfaction measures by examining their intercorrelations as manifested in their factor structure. Table 5 presents the results of the principal components analysis of the five measures. The results clearly supported a single factor solution, with only one eigenvalue exceeding the value of 1.0. As seen in Table 5, all factor loadings are above .50 and some are very close to 1.0. This suggests that the items are directed at a single unitary construct that may be considered to measure patient satisfaction.

Table 5: Factor Analysis of the Consumer Satisfaction Measures	
Satisfaction Measure	Factor Loading
<b>A: Overall Satisfaction:</b> Overall, the speech-language pathology program services were satisfactory	.92
<b>B: Perceived Improvement:</b> I believe that my communication and/or swallowing improved because of the speech-language pathology services	.74
<b>C: Family Involvement:</b> My family or other people important to me were included in my services	.56
<b>D: Pathologist Communication:</b> My speech-language pathologist did a good job answering the questions I had about my problem	.90
<b>E: Pathologist Respect.</b> My speech-language pathologist treated me with dignity and respect	.89

**Correlations Between FCM Change and Satisfaction.** Table 6 presents the bivariate correlations between the eleven FCMs and the five satisfaction measures. Although significant correlations are in the positive direction, they are also extremely small. The extremely large sample size shows

statistical significance for even the smallest correlations. The small correlations may be caused more by problems with the satisfaction measures than by the FCM themselves. Although the positive intercorrelations seen in the factor analysis of the satisfaction generally rules out excessive random error, there remain threats to validity posed by the nature of the questions and the possibility that the questions fail to force subjects into the level of cognitive activity required for a careful appraisal of the treatment. Whatever the cause, there is only a modest amount of evidence of validity provided in this analysis.

Table 6: Correlations Between FCM and Patient Satisfaction

	Overall Satisfaction	Perceived Improve	Family Involvement	Pathologist Comm.	Pathologist Respect
Motor Speech	0.12*	0.16*	0.10*	0.12*	0.10*
Voice	0.15*	0.22*	0.01	0.13*	0.11*
Fluency	0.17	0.19	0.08	-0.08	0.14
Swallowing	0.16*	0.17*	0.11*	0.14*	0.10*
Spoken Comp.	0.05	0.13*	0.04	0.04*	0.04
Spoken Expr.	0.07*	0.14*	0.04	0.06*	0.04
Writing	0.05	0.08*	0.02	0.06	0.02
Reading	0.03	0.07*	0.07*	0.05	0.03
Attention	0.04	0.08*	0.07*	0.03	0.01
Memory	0.11 *	0.14*	0.08*	0.09*	0.08*
Pragmatics	0.11 *	0.14*	0.08	0.07	0.04
Note: * = $p < .05$ .					

## CONCLUSIONS

This report describes an evaluation of the adult version of the functional communication measures of the NOMS project. Analyzing data from a stand alone reliability analysis and an administrative dataset of baseline and treatment closure records, we attempted to examine random and systematic sources of error in the eleven FCM scores. Overall, the study supported the FCM as a useful measure of the these functional domains. The following section describes the specific aspects of the psychometric evaluation.

### Reliability

The results of Study 1 show the adult version of the FCM to have impressive reliability. The level of agreement with the gold standard among the 1648 raters was as high as might be expected from repeated measures of the same raters. This pattern of results shows that the measure is relatively free from random slippage and it appears that the raters have little difficulty applying the criteria.

### Validity

**Correlational evidence.** Although the Study 2 research design did not provide a strong basis for evaluating the validity of the FCM, there were some patterns of results that did offer insight into the instrument. The correlations among the various scales provided some evidence of validity in their correlation with other FCMs. There was a clear pattern of positive correlation among some of the common domains. There was also, to a lesser degree, some evidence of discriminant validity provided by the lack of high correlations among dissimilar measures.

***Apparent positive bias in change at post-treatment.*** The analysis of the FCM distributions in change from baseline indicate a general negative skew in the data similar to that seen in the K-6 analysis. Unlike the K-6 study, the adult study did not have good measures against which to gauge the level of bias. Analysis of the distribution of the change from bias did show an appreciable level of zero and negative changes that "suggested" that pathologists were willing to indicate unsuccessful treatment when it appeared. Still the lack of other measures that are not susceptible to self-serving bias in the dataset to be used a criterion leaves us unable to assess the bias directly.

***Insensitivity of the satisfaction ratings.*** As in the K-6 analysis, the patient satisfaction measures appear to lack sensitivity to change in clinical status. The association between the satisfaction measures and change were very low, suggesting that the consumers did not go through a deep level of cognitive activity in providing the answers to the satisfaction questions.

### **Future Direction for Research**

These results suggest a high degree of reliability for the adult FCM similar to that seen in the K-6 versions. However, the lack of appropriate criterion measures limits what can be said about the measures validity. Future research should focus on creating and validating research instruments aimed at patient satisfaction and quality of life as an approach to better understanding of the error structure of the adult versions of the FCMs.

## **Computer Source Documents Supporting Statistical Analysis**

## The FREQ Procedure

## Satisfaction Statement A

STATEA	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	154	3.10	154	3.10
1	7	0.14	161	3.24
2	7	0.14	168	3.38
3	81	1.63	249	5.01
4	1524	30.69	1773	35.70
5	3193	64.30	4966	100.00

Frequency Missing = 36375

## Satisfaction Statement B

STATEB	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	436	8.81	436	8.81
1	7	0.14	443	8.95
2	51	1.03	494	9.98
3	277	5.60	771	15.58
4	1540	31.12	2311	46.70
5	2638	53.30	4949	100.00

Frequency Missing = 36392

## Satisfaction Statement C

STATEC	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	842	17.02	842	17.02
1	13	0.26	855	17.28
2	109	2.20	964	19.49
3	310	6.27	1274	25.75
4	1376	27.81	2650	53.57
5	2297	46.43	4947	100.00

Frequency Missing = 36394

## The FREQ Procedure

## Satisfaction Statement D

STATED	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	208	4.20	208	4.20
1	4	0.08	212	4.28
2	18	0.36	230	4.64
3	116	2.34	346	6.99
4	1289	26.02	1635	33.01
5	3318	66.99	4953	100.00

Frequency Missing = 36388

## Satisfaction Statement E

STATEE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	126	2.55	126	2.55
1	5	0.10	131	2.65
2	2	0.04	133	2.69
3	33	0.67	166	3.35
4	904	18.27	1070	21.62
5	3879	78.38	4949	100.00

Frequency Missing = 36392

## Satisfaction Statement F

STATEF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	77	14.31	77	14.31
1	1	0.19	78	14.50
2	9	1.67	87	16.17
3	24	4.46	111	20.63
4	147	27.32	258	47.96
5	280	52.04	538	100.00

Frequency Missing = 40803

## The FREQ Procedure

## Satisfaction Statement G

STATEG	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	73	23.47	73	23.47
2	8	2.57	81	26.05
3	16	5.14	97	31.19
4	80	25.72	177	56.91
5	134	43.09	311	100.00

Frequency Missing = 41030

## Satisfaction Statement H

STATEN	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	6.35	4	6.35
3	1	1.59	5	7.94
4	20	31.75	25	39.68
5	38	60.32	63	100.00

Frequency Missing = 41278

## The FREQ Procedure

## Change Score FCM A: Motor Speech

CHNGFCMA	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-5	1	0.01	1	0.01
-4	13	0.13	14	0.14
-3	29	0.30	43	0.44
-2	46	0.48	89	0.92
-1	130	1.34	219	2.26
0	2002	20.68	2221	22.95
1	4030	41.64	6251	64.58
2	2448	25.29	8699	89.87
3	696	7.19	9395	97.07
4	183	1.89	9578	98.96
5	67	0.69	9645	99.65
6	34	0.35	9679	100.00

Frequency Missing = 31662

## Change Score FCM B: Voice

CHNGFCMB	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-5	1	0.03	1	0.03
-4	2	0.06	3	0.09
-3	4	0.12	7	0.21
-2	10	0.30	17	0.50
-1	28	0.83	45	1.33
0	700	20.75	745	22.08
1	1088	32.25	1833	54.33
2	750	22.23	2583	76.56
3	411	12.18	2994	88.74
4	205	6.08	3199	94.81
5	111	3.29	3310	98.10
6	64	1.90	3374	100.00

Frequency Missing = 37967



## The FREQ Procedure

## Change Score FCM C: Fluency

CHNGFCMC	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-5	1	0.22	1	0.22
-4	3	0.65	4	0.86
-2	2	0.43	6	1.29
-1	5	1.08	11	2.37
0	100	21.51	111	23.87
1	170	36.56	281	60.43
2	97	20.86	378	81.29
3	54	11.61	432	92.90
4	23	4.95	455	97.85
5	7	1.51	462	99.35
6	3	0.65	465	100.00

Frequency Missing = 40876

## Change Score FCM D: Swallowing

CHNGFCMD	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-5	15	0.08	15	0.08
-4	31	0.16	46	0.24
-3	118	0.61	164	0.84
-2	232	1.19	396	2.03
-1	424	2.17	820	4.21
0	5669	29.07	6489	33.28
1	5041	25.85	11530	59.13
2	3694	18.95	15224	78.08
3	2157	11.06	17381	89.14
4	978	5.02	18359	94.16
5	618	3.17	18977	97.33
6	521	2.67	19498	100.00

Frequency Missing = 21843

## The FREQ Procedure

## Change Score FCM E: Spoken Language Comprehension

CHNGFCME	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-5	3	0.03	3	0.03
-4	8	0.07	11	0.09
-3	24	0.20	35	0.30
-2	53	0.45	88	0.75
-1	172	1.46	260	2.20
0	2872	24.33	3132	26.53
1	4605	39.01	7737	65.54
2	2560	21.69	10297	87.23
3	1018	8.62	11315	95.85
4	347	2.94	11662	98.79
5	117	0.99	11779	99.78
6	26	0.22	11805	100.00

Frequency Missing = 29536

## Change Score FCM F: Spoken Language Expression

CHNGFCMF	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-5	2	0.02	2	0.02
-4	6	0.05	8	0.07
-3	23	0.19	31	0.25
-2	43	0.35	74	0.60
-1	164	1.34	238	1.94
0	3109	25.38	3347	27.33
1	4944	40.37	8291	67.69
2	2656	21.69	10947	89.38
3	859	7.01	11806	96.39
4	296	2.42	12102	98.81
5	105	0.86	12207	99.67
6	41	0.33	12248	100.00

Frequency Missing = 29093

## The FREQ Procedure

## Change Score FCM G: Writing

CHNGFCMG	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-4	1	0.03	1	0.03
-3	4	0.10	5	0.13
-2	10	0.26	15	0.39
-1	37	0.96	52	1.36
0	1056	27.53	1108	28.88
1	1531	39.91	2639	68.80
2	748	19.50	3387	88.30
3	283	7.38	3670	95.67
4	126	3.28	3796	98.96
5	33	0.86	3829	99.82
6	7	0.18	3836	100.00

Frequency Missing = 37505

## Change Score FCM H: Reading

CHNGFCMH	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-3	8	0.15	8	0.15
-2	12	0.22	20	0.37
-1	52	0.96	72	1.32
0	1376	25.30	1448	26.62
1	2238	41.15	3686	67.77
2	1186	21.81	4872	89.58
3	409	7.52	5281	97.10
4	121	2.22	5402	99.32
5	32	0.59	5434	99.91
6	5	0.09	5439	100.00

Frequency Missing = 35902

## The FREQ Procedure

## Change Score FCM I: Attention

CHNGFCMI	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-4	2	0.02	2	0.02
-3	6	0.07	8	0.10
-2	35	0.43	43	0.53
-1	112	1.38	155	1.91
0	1713	21.16	1868	23.08
1	3131	38.68	4999	61.76
2	2080	25.70	7079	87.46
3	726	8.97	7805	96.43
4	226	2.79	8031	99.22
5	53	0.65	8084	99.88
6	10	0.12	8094	100.00

Frequency Missing = 33247

## Change Score FCM J: Memory

CHNGFCMJ	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-4	2	0.02	2	0.02
-3	9	0.08	11	0.10
-2	36	0.32	47	0.41
-1	112	0.99	159	1.40
0	2685	23.68	2844	25.08
1	4648	40.99	7492	66.07
2	2714	23.94	10206	90.01
3	856	7.55	11062	97.56
4	227	2.00	11289	99.56
5	40	0.35	11329	99.91
6	10	0.09	11339	100.00

Frequency Missing = 30002

## The FREQ Procedure

Change Score FCM K: Pragmatics

CHNGFCMK	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-4	1	0.04	1	0.04
-2	13	0.58	14	0.62
-1	25	1.11	39	1.73
0	409	18.14	448	19.87
1	786	34.86	1234	54.72
2	586	25.99	1820	80.71
3	262	11.62	2082	92.33
4	131	5.81	2213	98.14
5	30	1.33	2243	99.47
6	12	0.53	2255	100.00

Frequency Missing = 39086

The FACTOR Procedure  
 Initial Factor Method: Principal Components  
 Prior Communality Estimates: ONE

Eigenvalues of the Correlation Matrix: Total = 5    Average = 1

	Eigenvalue	Difference	Proportion	Cumulative
1	3.30027804	2.54003336	0.6601	0.6601
2	0.76024468	0.22647823	0.1520	0.8121
3	0.53376645	0.30006280	0.1068	0.9189
4	0.23370366	0.06169648	0.0467	0.9656
5	0.17200717		0.0344	1.0000

1 factor will be retained by the MINEIGEN criterion.

Factor Pattern

			Factor1
STATEA	Satisfaction	Statement A	0.91675
STATEB	Satisfaction	Statement B	0.74288
STATEC	Satisfaction	Statement C	0.56160
STATED	Satisfaction	Statement D	0.89859
STATEE	Satisfaction	Statement E	0.88608

Variance Explained by Each Factor

Factor1

3.3002780

Final Communality Estimates: Total = 3.300278

STATEA	STATEB	STATEC	STATED	STATEE
0.84042181	0.55186685	0.31539079	0.80745741	0.78514118

The FACTOR Procedure  
Initial Factor Method: Principal Components

Prior Communality Estimates: ONE

Eigenvalues of the Correlation Matrix: Total = 6 Average = 1

	Eigenvalue	Difference	Proportion	Cumulative
1	1.78580014	0.75952553	0.2976	0.2976
2	1.02627461	0.03877950	0.1710	0.4687
3	0.98749511	0.15834650	0.1646	0.6333
4	0.82914861	0.05045649	0.1382	0.7715
5	0.77869212	0.18610270	0.1298	0.9012
6	0.59258942		0.0988	1.0000

2 factors will be retained by the MINEIGEN criterion.

Factor Pattern

		Factor1	Factor2
CONTCARE	Continued Care Recommended	-0.32348	0.63303
LOS	Length of Stay	0.03706	0.66250
GRPUNITS	Number of Group 15 Min. Units of Tx	0.58202	-0.09944
INDUNITS	Number of Individual 15 Min. Units of Tx	0.73330	0.22215
EAUNITS	Number of Evaluation/Assessment 15 Min. Units of Tx	0.57180	-0.21363
TRNUNITS	Number of Training 15 Min. Units of Tx	0.69018	0.28593

Variance Explained by Each Factor

Factor1	Factor2
1.7858001	1.0262746

Final Communality Estimates: Total = 2.812075

CONTCARE	LOS	GRPUNITS	INDUNITS	EAUNITS	TRNUNITS
0.50536838	0.44028473	0.34863854	0.58708721	0.37259166	0.55810423

The FACTOR Procedure  
Prerotation Method: Varimax

Orthogonal Transformation Matrix

	1	2
1	0.98515	-0.17169
2	0.17169	0.98515

Rotated Factor Pattern

		Factor1	Factor2
CONTCARE	Continued Care Recommended	-0.20999	0.67917
LOS	Length of Stay	0.15026	0.64630
GRPUNITS	Number of Group 15 Min. Units of Tx	0.55631	-0.19790
INDUNITS	Number of Individual 15 Min. Units of Tx	0.76056	0.09295
EAUNITS	Number of Evaluation/Assessment 15 Min. Units of Tx	0.52663	-0.30863
TRNUNITS	Number of Training 15 Min. Units of Tx	0.72902	0.16319

Variance Explained by Each Factor

Factor1	Factor2
1.7634109	1.0486638

Final Communality Estimates: Total = 2.812075

CONTCARE	LOS	GRPUNITS	INDUNITS	EAUNITS	TRNUNITS
0.50536838	0.44028473	0.34863854	0.58708721	0.37259166	0.55810423



The FACTOR Procedure  
Rotation Method: Promax

## Target Matrix for Procrustean Transformation

		Factor1	Factor2
CONTCARE	Continued Care Recommended	-0.02635	0.94367
LOS	Length of Stay	0.01187	1.00000
GRPUNITS	Number of Group 15 Min. Units of Tx	0.85514	-0.04074
INDUNITS	Number of Individual 15 Min. Units of Tx	1.00000	0.00193
EAUNITS	Number of Evaluation/Assessment 15 Min. Units of Tx	0.65664	-0.13988
TRNUNITS	Number of Training 15 Min. Units of Tx	0.95019	0.01128

## Procrustean Transformation Matrix

	1	2
1	1.29639826	0.01698179
2	0.03093799	1.2803418

## Normalized Oblique Transformation Matrix

	1	2
1	0.98145	-0.15872
2	0.19528	0.98802

## Inter-Factor Correlations

	Factor1	Factor2
Factor1	1.00000	-0.03711
Factor2	-0.03711	1.00000

## Rotated Factor Pattern (Standardized Regression Coefficients)

		Factor1	Factor2
CONTCARE	Continued Care Recommended	-0.19386	0.67679
LOS	Length of Stay	0.16575	0.64869
GRPUNITS	Number of Group 15 Min. Units of Tx	0.55181	-0.19063
INDUNITS	Number of Individual 15 Min. Units of Tx	0.76308	0.10310
EAUNITS	Number of Evaluation/Assessment 15 Min. Units of Tx	0.51948	-0.30182
TRNUNITS	Number of Training 15 Min. Units of Tx	0.73321	0.17296

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The FACTOR Procedure  
Rotation Method: Promax

## Reference Axis Correlations

	Factor1	Factor2
Factor1	1.00000	0.03711
Factor2	0.03711	1.00000

## Reference Structure (Semipartial Correlations)

		Factor1	Factor2
CONTCARE	Continued Care Recommended	-0.19372	0.67633
LOS	Length of Stay	0.16564	0.64824
GRPUNITS	Number of Group 15 Min. Units of Tx	0.55143	-0.19050
INDUNITS	Number of Individual 15 Min. Units of Tx	0.76256	0.10303
EAUNITS	Number of Evaluation/Assessment 15 Min. Units of Tx	0.51912	-0.30162
TRNUNITS	Number of Training 15 Min. Units of Tx	0.73271	0.17284

## Variance Explained by Each Factor Eliminating Other Factors

Factor1	Factor2
1.7568760	1.0453823

## Factor Structure (Correlations)

		Factor1	Factor2
CONTCARE	Continued Care Recommended	-0.21898	0.68399
LOS	Length of Stay	0.14167	0.64253
GRPUNITS	Number of Group 15 Min. Units of Tx	0.55888	-0.21111
INDUNITS	Number of Individual 15 Min. Units of Tx	0.75926	0.07478
EAUNITS	Number of Evaluation/Assessment 15 Min. Units of Tx	0.53068	-0.32110
TRNUNITS	Number of Training 15 Min. Units of Tx	0.72679	0.14575

## Variance Explained by Each Factor Ignoring Other Factors

Factor1	Factor2
1.7666925	1.0551988

frequencies of outcome variables, 3rd visit

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The FACTOR Procedure  
Rotation Method: Promax

Final Communality Estimates: Total = 2.812075

CONTCARE	LOS	GRPUNITS	INDUNITS	EAUNITS	TRNUNITS
0.50536838	0.44028473	0.34863854	0.58708721	0.37259166	0.55810423

## The CORR Procedure

8 variables: STATEA STATEB STATEC STATED STATEE STATEF STATEG STATEH

## Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
STATEA	4966	4.49557	0.96352	22325	0	5.00000
STATEB	4949	4.09982	1.42933	20290	0	5.00000
STATEC	4947	3.66889	1.80362	18150	0	5.00000
STATED	4953	4.46881	1.08051	22134	0	5.00000
STATEE	4949	4.67145	0.87054	23119	0	5.00000
STATEF	538	3.86431	1.71046	2079	0	5.00000
STATEG	311	3.38907	1.99509	1054	0	5.00000
STATEH	63	4.33333	1.24434	273.00000	0	5.00000

## Simple Statistics

Variable	Label
STATEA	Satisfaction Statement A
STATEB	Satisfaction Statement B
STATEC	Satisfaction Statement C
STATED	Satisfaction Statement D
STATEE	Satisfaction Statement E
STATEF	Satisfaction Statement F
STATEG	Satisfaction Statement G
STATEH	Satisfaction Statement H

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	STATEA	STATEB	STATEC	STATED
STATEA Satisfaction Statement A	1.00000 4966	0.59507 <.0001 4944	0.39855 <.0001 4941	0.79134 <.0001 4947
STATEB Satisfaction Statement B	0.59507 <.0001 4944	1.00000 4949	0.30819 <.0001 4930	0.57164 <.0001 4938
STATEC Satisfaction Statement C	0.39855 <.0001 4941	0.30819 <.0001 4930	1.00000 4947	0.41793 <.0001 4933

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## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under HO: Rho=0

Number of Observations

	STATEA	STATEB	STATEC	STATED
STATED	0.79134	0.57164	0.41793	1.00000
Satisfaction Statement D	<.0001	<.0001	<.0001	
	4947	4938	4933	4953
STATEE	0.81902	0.53040	0.36056	0.76487
Satisfaction Statement E	<.0001	<.0001	<.0001	<.0001
	4943	4931	4927	4936
STATEF	0.16134	0.07995	0.09351	0.17880
Satisfaction Statement F	0.0002	0.0667	0.0314	<.0001
	534	527	530	531
STATEG	0.24719	0.25834	0.15267	0.35563
Satisfaction Statement G	<.0001	<.0001	0.0074	<.0001
	311	309	307	310
STATEH	0.54566	0.11302	0.08747	0.31117
Satisfaction Statement H	<.0001	0.3778	0.4990	0.0131
	63	63	62	63

## Pearson Correlation Coefficients

Prob &gt; |r| under HO: Rho=0

Number of Observations

	STATEE	STATEF	STATEG	STATEH
STATEA	0.81902	0.16134	0.24719	0.54566
Satisfaction Statement A	<.0001	0.0002	<.0001	<.0001
	4943	534	311	63
STATEB	0.53040	0.07995	0.25834	0.11302
Satisfaction Statement B	<.0001	0.0667	<.0001	0.3778
	4931	527	309	63
STATEC	0.36056	0.09351	0.15267	0.08747
Satisfaction Statement C	<.0001	0.0314	0.0074	0.4990
	4927	530	307	62
STATED	0.76487	0.17880	0.35563	0.31117
Satisfaction Statement D	<.0001	<.0001	<.0001	0.0131
	4936	531	310	63

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	STATEE	STATEF	STATEG	STATEH
STATEE Satisfaction Statement E	1.00000 4949	0.18934 <.0001 533	0.23369 <.0001 311	0.23301 0.0661 63
STATEF Satisfaction Statement F	0.18934 <.0001 533	1.00000 538	0.18059 0.0015 308	0.45062 0.0002 63
STATEG Satisfaction Statement G	0.23369 <.0001 311	0.18059 0.0015 308	1.00000 311	0.52409 <.0001 61
STATEH Satisfaction Statement H	0.23301 0.0661 63	0.45062 0.0002 63	0.52409 <.0001 61	1.00000 63

frequencies of outcome variables, 3rd visit

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# The CORR Procedure

16 variables: CHNGFCMA CHNGFCMB CHNGFCMC CHNGFCMD CHNGFCME CHNGFCMF CHNGFCMG  
CHNGFCMH CHNGFCMI CHNGFCMJ CHNGFCMK STATEA STATEB STATEC STATED  
STATEE

## Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
CHNGFCMA	9679	1.23143	1.11554	11919	-5.00000	6.00000
CHNGFCMB	3374	1.63219	1.47300	5507	-5.00000	6.00000
CHNGFCMC	465	1.38710	1.38209	645.00000	-5.00000	6.00000
CHNGFCMD	19498	1.41486	1.65398	27587	-5.00000	6.00000
CHNGFCME	11805	1.22922	1.17820	14511	-5.00000	6.00000
CHNGFCMF	12248	1.17856	1.13628	14435	-5.00000	6.00000
CHNGFCMG	3836	1.17675	1.13957	4514	-4.00000	6.00000
CHNGFCMH	5439	1.17871	1.06727	6411	-3.00000	6.00000
CHNGFCMI	8094	1.29602	1.11319	10490	-4.00000	6.00000
CHNGFCMJ	11339	1.19878	1.04046	13593	-4.00000	6.00000
CHNGFCMK	2255	1.52328	1.26844	3435	-4.00000	6.00000
STATEA	4966	4.49557	0.96352	22325	0	5.00000
STATEB	4949	4.09982	1.42933	20290	0	5.00000
STATEC	4947	3.66889	1.80362	18150	0	5.00000
STATED	4953	4.46881	1.08051	22134	0	5.00000
STATEE	4949	4.67145	0.87054	23119	0	5.00000

## Simple Statistics

Variable	Label
CHNGFCMA	Change Score FCM A: Motor Speech
CHNGFCMB	Change Score FCM B: Voice
CHNGFCMC	Change Score FCM C: Fluency
CHNGFCMD	Change Score FCM D: Swallowing
CHNGFCME	Change Score FCM E: Spoken Language Comprehension
CHNGFCMF	Change Score FCM F: Spoken Language Expression
CHNGFCMG	Change Score FCM G: Writing
CHNGFCMH	Change Score FCM H: Reading
CHNGFCMI	Change Score FCM I: Attention
CHNGFCMJ	Change Score FCM J: Memory
CHNGFCMK	Change Score FCM K: Pragmatics
STATEA	Satisfaction Statement A
STATEB	Satisfaction Statement B
STATEC	Satisfaction Statement C
STATED	Satisfaction Statement D
STATEE	Satisfaction Statement E

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCMA	CHNGFCMB	CHNGFCMC	CHNGFCMD
CHNGFCMA	1.00000	0.62898	0.71024	0.50836
Change Score FCM A: Motor Speech	<.0001	<.0001	<.0001	<.0001
	9679	1052	189	5109
CHNGFCMB	0.62898	1.00000	0.56072	0.52031
Change Score FCM B: Voice	<.0001	<.0001	<.0001	<.0001
	1052	3374	85	1490
CHNGFCMC	0.71024	0.56072	1.00000	0.39062
Change Score FCM C: Fluency	<.0001	<.0001	<.0001	<.0001
	189	85	465	112
CHNGFCMD	0.50836	0.52031	0.39062	1.00000
Change Score FCM D: Swallowing	<.0001	<.0001	<.0001	<.0001
	5109	1490	112	19498
CHNGFCME	0.61592	0.55672	0.66290	0.49234
Change Score FCM E: Spoken Language Comprehension	<.0001	<.0001	<.0001	<.0001
	3439	630	169	4659
CHNGFCMF	0.71216	0.60725	0.59445	0.49283
Change Score FCM F: Spoken Language Expression	<.0001	<.0001	<.0001	<.0001
	3570	633	187	4571
CHNGFCMG	0.46884	0.42329	0.48723	0.33567
Change Score FCM G: Writing	<.0001	<.0001	<.0001	<.0001
	1195	256	95	1028
CHNGFCMH	0.47761	0.38740	0.50551	0.38022
Change Score FCM H: Reading	<.0001	<.0001	<.0001	<.0001
	1505	263	96	1404
CHNGFCMI	0.57445	0.55834	0.17301	0.48101
Change Score FCM I: Attention	<.0001	<.0001	0.1112	<.0001
	1681	480	86	2670
CHNGFCMJ	0.52016	0.43968	0.44562	0.42484
Change Score FCM J: Memory	<.0001	<.0001	<.0001	<.0001
	2410	690	121	3216
CHNGFCMK	0.60877	0.51489	0.33680	0.46320
Change Score FCM K: Pragmatics	<.0001	<.0001	0.0360	<.0001
	581	195	39	716



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## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCME	CHNGFCMF	CHNGFCMG	CHNGFCMH
CHNGFCMA	0.61592	0.71216	0.46884	0.47761
Change Score FCM A: Motor Speech	<.0001	<.0001	<.0001	<.0001
	3439	3570	1195	1505
CHNGFCMB	0.55672	0.60725	0.42329	0.38740
Change Score FCM B: Voice	<.0001	<.0001	<.0001	<.0001
	630	633	256	263
CHNGFCMC	0.66290	0.59445	0.48723	0.50551
Change Score FCM C: Fluency	<.0001	<.0001	<.0001	<.0001
	169	187	95	96
CHNGFCMD	0.49234	0.49283	0.33567	0.38022
Change Score FCM D: Swallowing	<.0001	<.0001	<.0001	<.0001
	4659	4571	1028	1404
CHNGFCME	1.00000	0.73797	0.53232	0.62819
Change Score FCM E: Spoken Language Comprehension		<.0001	<.0001	<.0001
	11805	9475	2655	3626
CHNGFCMF	0.73797	1.00000	0.58858	0.61285
Change Score FCM F: Spoken Language Expression	<.0001		<.0001	<.0001
	9475	12248	2892	3612
CHNGFCMG	0.53232	0.58858	1.00000	0.65559
Change Score FCM G: Writing	<.0001	<.0001		<.0001
	2655	2892	3836	2903
CHNGFCMH	0.62819	0.61285	0.65559	1.00000
Change Score FCM H: Reading	<.0001	<.0001	<.0001	
	3626	3612	2903	5439
CHNGFCMI	0.67892	0.65903	0.59486	0.64212
Change Score FCM I: Attention	<.0001	<.0001	<.0001	<.0001
	3203	2955	1212	1881
CHNGFCMJ	0.64685	0.61390	0.56278	0.59884
Change Score FCM J: Memory	<.0001	<.0001	<.0001	<.0001
	4286	4003	1524	2440
CHNGFCMK	0.70689	0.69040	0.63748	0.63161
Change Score FCM K: Pragmatics	<.0001	<.0001	<.0001	<.0001
	1021	955	489	706

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCMI	CHNGFCMJ	CHNGFCMK	STATEA
CHNGFCMA	0.57445	0.52016	0.60877	0.11577
Change Score FCM A: Motor Speech	<.0001	<.0001	<.0001	<.0001
	1681	2410	581	1375
CHNGFCMB	0.55834	0.43968	0.51489	0.15523
Change Score FCM B: Voice	<.0001	<.0001	<.0001	0.0003
	480	690	195	547
CHNGFCMC	0.17301	0.44562	0.33680	0.17013
Change Score FCM C: Fluency	0.1112	<.0001	0.0360	0.2639
	86	121	39	45
CHNGFCMD	0.48101	0.42484	0.46320	0.15603
Change Score FCM D: Swallowing	<.0001	<.0001	<.0001	<.0001
	2670	3216	716	2032
CHNGFCME	0.67892	0.64685	0.70689	0.04793
Change Score FCM E: Spoken Language Comprehension	<.0001	<.0001	<.0001	0.0602
	3203	4286	1021	1538
CHNGFCMF	0.65903	0.61390	0.69040	0.07041
Change Score FCM F: Spoken Language Expression	<.0001	<.0001	<.0001	0.0038
	2955	4003	955	1691
CHNGFCMG	0.59486	0.56278	0.63748	0.05101
Change Score FCM G: Writing	<.0001	<.0001	<.0001	0.1595
	1212	1524	489	762
CHNGFCMH	0.64212	0.59884	0.63161	0.03075
Change Score FCM H: Reading	<.0001	<.0001	<.0001	0.3331
	1881	2440	706	993
CHNGFCMI	1.00000	0.72152	0.74497	0.04260
Change Score FCM I: Attention		<.0001	<.0001	0.1388
	8094	5827	1661	1209
CHNGFCMJ	0.72152	1.00000	0.69680	0.10570
Change Score FCM J: Memory	<.0001		<.0001	<.0001
	5827	11339	1673	1849
CHNGFCMK	0.74497	0.69680	1.00000	0.10830
Change Score FCM K: Pragmatics	<.0001	<.0001		0.0378
	1661	1673	2255	368

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	STATEB	STATEC	STATED	STATEE
CHNGFCMA	0.15668	0.09857	0.11959	0.10003
Change Score FCM A: Motor Speech	<.0001	0.0003	<.0001	0.0002
	1373	1368	1375	1369
CHNGFCMB	0.22691	0.01694	0.13417	0.10198
Change Score FCM B: Voice	<.0001	0.6929	0.0016	0.0168
	546	546	548	549
CHNGFCMC	0.18747	0.07711	-0.08454	0.14120
Change Score FCM C: Fluency	0.2175	0.6146	0.5808	0.3549
	45	45	45	45
CHNGFCMD	0.17303	0.11169	0.14506	0.09773
Change Score FCM D: Swallowing	<.0001	<.0001	<.0001	<.0001
	2018	2020	2022	2026
CHNGFCME	0.12633	0.04396	0.04569	0.03719
Change Score FCM E: Spoken Language Comprehension	<.0001	0.0852	0.0736	0.1455
	1533	1534	1534	1534
CHNGFCMF	0.13750	0.03577	0.05972	0.04159
Change Score FCM F: Spoken Language Expression	<.0001	0.1419	0.0141	0.0883
	1687	1687	1688	1680
CHNGFCMG	0.07907	0.02215	0.06254	0.02464
Change Score FCM G: Writing	0.0291	0.5418	0.0849	0.4982
	762	761	760	758
CHNGFCMH	0.06505	0.07118	0.04878	0.02492
Change Score FCM H: Reading	0.0404	0.0250	0.1245	0.4349
	993	991	993	984
CHNGFCMI	0.08311	0.06823	0.02978	0.00504
Change Score FCM I: Attention	0.0038	0.0177	0.3012	0.8615
	1209	1209	1207	1200
CHNGFCMJ	0.14236	0.07589	0.09217	0.08329
Change Score FCM J: Memory	<.0001	0.0011	<.0001	0.0003
	1849	1847	1845	1843
CHNGFCMK	0.14375	0.08194	0.06608	0.04473
Change Score FCM K: Pragmatics	0.0057	0.1166	0.2066	0.3935
	369	368	367	366

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCMA	CHNGFCMB	CHNGFCMC	CHNGFCMD
STATEA	0.11577	0.15523	0.17013	0.15603
Satisfaction Statement A	<.0001	0.0003	0.2639	<.0001
	1375	547	45	2032
STATEB	0.15668	0.22691	0.18747	0.17303
Satisfaction Statement B	<.0001	<.0001	0.2175	<.0001
	1373	546	45	2018
STATEC	0.09857	0.01694	0.07711	0.11169
Satisfaction Statement C	0.0003	0.6929	0.6146	<.0001
	1368	546	45	2020
STATED	0.11959	0.13417	-0.08454	0.14506
Satisfaction Statement D	<.0001	0.0016	0.5808	<.0001
	1375	548	45	2022
STATEE	0.10003	0.10198	0.14120	0.09773
Satisfaction Statement E	0.0002	0.0168	0.3549	<.0001
	1369	549	45	2026

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCME	CHNGFCMF	CHNGFCMG	CHNGFCMH
STATEA	0.04793	0.07041	0.05101	0.03075
Satisfaction Statement A	0.0602	0.0038	0.1595	0.3331
	1538	1691	762	993
STATEB	0.12633	0.13750	0.07907	0.06505
Satisfaction Statement B	<.0001	<.0001	0.0291	0.0404
	1533	1687	762	993
STATEC	0.04396	0.03577	0.02215	0.07118
Satisfaction Statement C	0.0852	0.1419	0.5418	0.0250
	1534	1687	761	991
STATED	0.04569	0.05972	0.06254	0.04878
Satisfaction Statement D	0.0736	0.0141	0.0849	0.1245
	1534	1688	760	993

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCME	CHNGFCMF	CHNGFCMG	CHNGFCMH
STATEE	0.03719	0.04159	0.02464	0.02492
Satisfaction Statement E	0.1455	0.0883	0.4982	0.4349
	1534	1680	758	984

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCMI	CHNGFCMJ	CHNGFCMK	STATEA
STATEA	0.04260	0.10570	0.10830	1.00000
Satisfaction Statement A	0.1388	<.0001	0.0378	
	1209	1849	368	4966
STATEB	0.08311	0.14236	0.14375	0.59507
Satisfaction Statement B	0.0038	<.0001	0.0057	<.0001
	1209	1849	369	4944
STATEC	0.06823	0.07589	0.08194	0.39855
Satisfaction Statement C	0.0177	0.0011	0.1166	<.0001
	1209	1847	368	4941
STATED	0.02978	0.09217	0.06608	0.79134
Satisfaction Statement D	0.3012	<.0001	0.2066	<.0001
	1207	1845	367	4947
STATEE	0.00504	0.08329	0.04473	0.81902
Satisfaction Statement E	0.8615	0.0003	0.3935	<.0001
	1200	1843	366	4943

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	STATEB	STATEC	STATED	STATEE
STATEA	0.59507	0.39855	0.79134	0.81902
Satisfaction Statement A	<.0001	<.0001	<.0001	<.0001
	4944	4941	4947	4943
STATEB	1.00000	0.30819	0.57164	0.53040
Satisfaction Statement B		<.0001	<.0001	<.0001
	4949	4930	4938	4931

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	STATEB	STATEC	STATED	STATEE
STATEC	0.30819	1.00000	0.41793	0.36056
Satisfaction Statement C	<.0001		<.0001	<.0001
	4930	4947	4933	4927
STATED	0.57164	0.41793	1.00000	0.76487
Satisfaction Statement D	<.0001	<.0001		<.0001
	4938	4933	4953	4936
STATEE	0.53040	0.36056	0.76487	1.00000
Satisfaction Statement E	<.0001	<.0001	<.0001	
	4931	4927	4936	4949

The MEANS Procedure

variable	Label	N	Mean	Std Dev
SSFCMA	Start Score FCM A: Motor Speech	10653	3.7642917	1.4568244
SSFCMB	Start Score FCM B: Voice	3857	3.2263417	1.3139654
SSFCMC	Start Score FCM C: Fluency	576	3.6024306	1.4977993
SSFCMD	Start Score FCM D: Swallowing	21083	3.0867049	1.5897031
SSFCME	Start Score FCM E: Spoken Language Comprehension	13088	3.3137989	1.4790823
SSFCMF	Start Score FCM F: Spoken language Expression	13607	3.1879915	1.4794669
SSFCMG	Start Score FCM G: Writing	4427	2.8597244	1.4134056
SSFCMH	Start Score FCM H: Reading	6189	3.5374051	1.4362442
SSFCMI	Start Score FCM I: Attention	8844	3.3769787	1.3105903
SSFCMJ	Start Score FCM J: Memory	12410	3.4744561	1.2601239
SSFCMK	Start Score FCM K: Pragmatics	2493	3.3473726	1.3131596
CSFCMA	Close Score FCM A: Motor Speech	9833	4.9942032	1.6111728
CSFCMB	Close Score FCM B: Voice	3438	4.8353694	1.5892440
CSFCMC	Close Score FCM C: Fluency	490	4.9653061	1.6181551
CSFCMD	Close Score FCM D: Swallowing	19794	4.5007073	1.9136950
CSFCME	Close Score FCM E: Spoken Language Comprehension	11997	4.5284654	1.6513236
CSFCMF	Close Score FCM F: Spoken Language Expression	12420	4.3566023	1.7148248
CSFCMG	Close Score FCM G: Writing	3892	4.0197842	1.6514191
CSFCMH	Close Score FCM H: Reading	5525	4.6988235	1.5017997
CSFCMI	Close Score FCM I: Attention	8193	4.6532406	1.4327306
CSFCMJ	Close Score FCM J: Memory	11485	4.6529386	1.4225816
CSFCMK	Close Score FCM K: Pragmatics	2283	4.8567674	1.4231963
CHNGFCMA	Change Score FCM A: Motor Speech	9679	1.2314289	1.1155405
CHNGFCMB	Change Score FCM B: Voice	3374	1.6321873	1.4730049
CHNGFCMC	Change Score FCM C: Fluency	465	1.3870968	1.3820919
CHNGFCMD	Change Score FCM D: Swallowing	19498	1.4148631	1.6539832
CHNGFCME	Change Score FCM E: Spoken Language Comprehension	11805	1.2292249	1.1781976
CHNGFCMF	Change Score FCM F: Spoken Language Expression	12248	1.1785598	1.1362798
CHNGFCMG	Change Score FCM G: Writing	3836	1.1767466	1.1395653
CHNGFCMH	Change Score FCM H: Reading	5439	1.1787093	1.0672750
CHNGFCMI	Change Score FCM I: Attention	8094	1.2960217	1.1131873
CHNGFCMJ	Change Score FCM J: Memory	11339	1.1987830	1.0404563
CHNGFCMK	Change Score FCM K: Pragmatics	2255	1.5232816	1.2684360

variable	Label	Minimum	Maximum
SSFCMA	Start Score FCM A: Motor Speech	1.0000000	6.0000000
SSFCMB	Start Score FCM B: Voice	1.0000000	6.0000000
SSFCMC	Start Score FCM C: Fluency	1.0000000	6.0000000
SSFCMD	Start Score FCM D: Swallowing	1.0000000	6.0000000
SSFCME	Start Score FCM E: Spoken Language Comprehension	1.0000000	6.0000000
SSFCMF	Start Score FCM F: Spoken language Expression	1.0000000	6.0000000
SSFCMG	Start Score FCM G: Writing	1.0000000	6.0000000
SSFCMH	Start Score FCM H: Reading	1.0000000	6.0000000
SSFCMI	Start Score FCM I: Attention	1.0000000	6.0000000

## The MEANS Procedure

Variable	Label	Minimum	Maximum
SSFCMJ	Start Score FCM J: Memory	1.0000000	6.0000000
SSFCMK	Start Score FCM K: Pragmatics	1.0000000	6.0000000
CSFCMA	Close Score FCM A: Motor Speech	1.0000000	7.0000000
CSFCMB	Close Score FCM B: Voice	1.0000000	7.0000000
CSFCMC	Close Score FCM C: Fluency	1.0000000	7.0000000
CSFCMD	Close Score FCM D: Swallowing	1.0000000	7.0000000
CSFCME	Close Score FCM E: Spoken Language Comprehension	1.0000000	7.0000000
CSFCMF	Close Score FCM F: Spoken Language Expression	1.0000000	7.0000000
CSFCMG	Close Score FCM G: Writing	1.0000000	7.0000000
CSFCMH	Close Score FCM H: Reading	1.0000000	7.0000000
CSFCMI	Close Score FCM I: Attention	0	7.0000000
CSFCMJ	Close Score FCM J: Memory	1.0000000	7.0000000
CSFCMK	Close Score FCM K: Pragmatics	1.0000000	7.0000000
CHNGFCMA	Change Score FCM A: Motor Speech	-5.0000000	6.0000000
CHNGFCMB	Change Score FCM B: Voice	-5.0000000	6.0000000
CHNGFCMC	Change Score FCM C: Fluency	-5.0000000	6.0000000
CHNGFCMD	Change Score FCM D: Swallowing	-5.0000000	6.0000000
CHNGFCME	Change Score FCM E: Spoken Language Comprehension	-5.0000000	6.0000000
CHNGFCMF	Change Score FCM F: Spoken Language Expression	-5.0000000	6.0000000
CHNGFCMG	Change Score FCM G: Writing	-4.0000000	6.0000000
CHNGFCMH	Change Score FCM H: Reading	-3.0000000	6.0000000
CHNGFCMI	Change Score FCM I: Attention	-4.0000000	6.0000000
CHNGFCMJ	Change Score FCM J: Memory	-4.0000000	6.0000000
CHNGFCMK	Change Score FCM K: Pragmatics	-4.0000000	6.0000000



## The MEANS Procedure

Variable	Label		N	Mean	Std Dev	Minimum
STATEA	Satisfaction	Statement A	4966	4.4955699	0.9635243	0
STATEB	Satisfaction	Statement B	4949	4.0998181	1.4293303	0
STATEC	Satisfaction	Statement C	4947	3.6688902	1.8036245	0
STATED	Satisfaction	Statement D	4953	4.4688068	1.0805064	0
STATEE	Satisfaction	Statement E	4949	4.6714488	0.8705381	0
STATEF	Satisfaction	Statement F	538	3.8643123	1.7104644	0
STATEG	Satisfaction	Statement G	311	3.3890675	1.9950930	0
STATEH	Satisfaction	Statement H	63	4.3333333	1.2443420	0

Variable	Label		Maximum
STATEA	Satisfaction	Statement A	5.0000000
STATEB	Satisfaction	Statement B	5.0000000
STATEC	Satisfaction	Statement C	5.0000000
STATED	Satisfaction	Statement D	5.0000000
STATEE	Satisfaction	Statement E	5.0000000
STATEF	Satisfaction	Statement F	5.0000000
STATEG	Satisfaction	Statement G	5.0000000
STATEH	Satisfaction	Statement H	5.0000000

## The CORR Procedure

11 variables: CHNGFCMA CHNGFCMB CHNGFCMC CHNGFCMD CHNGFCME CHNGFCMF CHNGFCMG CHNGFCMH  
CHNGFCMI CHNGFCMJ CHNGFCMK

## Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
CHNGFCMA	9679	1.23143	1.11554	11919	-5.00000	6.00000
CHNGFCMB	3374	1.63219	1.47300	5507	-5.00000	6.00000
CHNGFCMC	465	1.38710	1.38209	645.00000	-5.00000	6.00000
CHNGFCMD	19498	1.41486	1.65398	27587	-5.00000	6.00000
CHNGFCME	11805	1.22922	1.17820	14511	-5.00000	6.00000
CHNGFCMF	12248	1.17856	1.13628	14435	-5.00000	6.00000
CHNGFCMG	3836	1.17675	1.13957	4514	-4.00000	6.00000
CHNGFCMH	5439	1.17871	1.06727	6411	-3.00000	6.00000
CHNGFCMI	8094	1.29602	1.11319	10490	-4.00000	6.00000
CHNGFCMJ	11339	1.19878	1.04046	13593	-4.00000	6.00000
CHNGFCMK	2255	1.52328	1.26844	3435	-4.00000	6.00000

## Simple Statistics

Variable	Label
CHNGFCMA	Change Score FCM A: Motor Speech
CHNGFCMB	Change Score FCM B: Voice
CHNGFCMC	Change Score FCM C: Fluency
CHNGFCMD	Change Score FCM D: Swallowing
CHNGFCME	Change Score FCM E: Spoken Language Comprehension
CHNGFCMF	Change Score FCM F: Spoken Language Expression
CHNGFCMG	Change Score FCM G: Writing
CHNGFCMH	Change Score FCM H: Reading
CHNGFCMI	Change Score FCM I: Attention
CHNGFCMJ	Change Score FCM J: Memory
CHNGFCMK	Change Score FCM K: Pragmatics

## The CORR Procedure

16 variables:

STATEA STATEB STATEC STATED STATEE CHNGFCMA CHNGFCMB CHNGFCMC  
CHNGFCMD CHNGFCME CHNGFCMF CHNGFCMG CHNGFCMH CHNGFCMI CHNGFCMJ CHNGFCMK

## Simple Statistics

variable	N	Mean	Std Dev	Sum	Minimum	Maximum
STATEA	4966	4.49557	0.96352	22325	0	5.00000
STATEB	4949	4.09982	1.42933	20290	0	5.00000
STATEC	4947	3.66889	1.80362	18150	0	5.00000
STATED	4953	4.46881	1.08051	22134	0	5.00000
STATEE	4949	4.67145	0.87054	23119	0	5.00000
CHNGFCMA	9679	1.23143	1.11554	11919	-5.00000	6.00000
CHNGFCMB	3374	1.63219	1.47300	5507	-5.00000	6.00000
CHNGFCMC	465	1.38710	1.38209	645.00000	-5.00000	6.00000
CHNGFCMD	19498	1.41486	1.65398	27587	-5.00000	6.00000
CHNGFCME	11805	1.22922	1.17820	14511	-5.00000	6.00000
CHNGFCMF	12248	1.17856	1.13628	14435	-5.00000	6.00000
CHNGFCMG	3836	1.17675	1.13957	4514	-4.00000	6.00000
CHNGFCMH	5439	1.17871	1.06727	6411	-3.00000	6.00000
CHNGFCMI	8094	1.29602	1.11319	10490	-4.00000	6.00000
CHNGFCMJ	11339	1.19878	1.04046	13593	-4.00000	6.00000
CHNGFCMK	2255	1.52328	1.26844	3435	-4.00000	6.00000

## Simple Statistics

variable	Label
STATEA	Satisfaction Statement A
STATEB	Satisfaction Statement B
STATEC	Satisfaction Statement C
STATED	Satisfaction Statement D
STATEE	Satisfaction Statement E
CHNGFCMA	Change Score FCM A: Motor Speech
CHNGFCMB	Change Score FCM B: Voice
CHNGFCMC	Change Score FCM C: Fluency
CHNGFCMD	Change Score FCM D: Swallowing
CHNGFCME	Change Score FCM E: Spoken Language Comprehension
CHNGFCMF	Change Score FCM F: Spoken Language Expression
CHNGFCMG	Change Score FCM G: Writing
CHNGFCMH	Change Score FCM H: Reading
CHNGFCMI	Change Score FCM I: Attention
CHNGFCMJ	Change Score FCM J: Memory
CHNGFCMK	Change Score FCM K: Pragmatics

## The CORR Procedure

Pearson Correlation Coefficients  
 Prob > |r| under H0: Rho=0  
 Number of Observations

	STATEA	STATEB	STATEC	STATED
STATEA Satisfaction Statement A	1.00000 4966	0.59507 <.0001 4944	0.39855 <.0001 4941	0.79134 <.0001 4947
STATEB Satisfaction Statement B	0.59507 <.0001 4944	1.00000 4949	0.30819 <.0001 4930	0.57164 <.0001 4938
STATEC Satisfaction Statement C	0.39855 <.0001 4941	0.30819 <.0001 4930	1.00000 4947	0.41793 <.0001 4933
STATED Satisfaction Statement D	0.79134 <.0001 4947	0.57164 <.0001 4938	0.41793 <.0001 4933	1.00000 4953
STATEE Satisfaction Statement E	0.81902 <.0001 4943	0.53040 <.0001 4931	0.36056 <.0001 4927	0.76487 <.0001 4936
CHNGFCMA Change Score FCM A: Motor Speech	0.11577 <.0001 1375	0.15668 <.0001 1373	0.09857 0.0003 1368	0.11959 <.0001 1375
CHNGFCMB Change Score FCM B: Voice	0.15523 0.0003 547	0.22691 <.0001 546	0.01694 0.6929 546	0.13417 0.0016 548
CHNGFCMC Change Score FCM C: Fluency	0.17013 0.2639 45	0.18747 0.2175 45	0.07711 0.6146 45	-0.08454 0.5808 45
CHNGFCMD Change Score FCM D: Swallowing	0.15603 <.0001 2032	0.17303 <.0001 2018	0.11169 <.0001 2020	0.14506 <.0001 2022
CHNGFCME Change Score FCM E: Spoken Language Comprehension	0.04793 0.0602 1538	0.12633 <.0001 1533	0.04396 0.0852 1534	0.04569 0.0736 1534
CHNGFCMF Change Score FCM F: Spoken Language Expression	0.07041 0.0038 1691	0.13750 <.0001 1687	0.03577 0.1419 1687	0.05972 0.0141 1688

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	STATEE	CHNGFCMA	CHNGFCMB	CHNGFCMC
STATEA	0.81902	0.11577	0.15523	0.17013
Satisfaction Statement A	<.0001	<.0001	0.0003	0.2639
	4943	1375	547	45
STATEB	0.53040	0.15668	0.22691	0.18747
Satisfaction Statement B	<.0001	<.0001	<.0001	0.2175
	4931	1373	546	45
STATEC	0.36056	0.09857	0.01694	0.07711
Satisfaction Statement C	<.0001	0.0003	0.6929	0.6146
	4927	1368	546	45
STATED	0.76487	0.11959	0.13417	-0.08454
Satisfaction Statement D	<.0001	<.0001	0.0016	0.5808
	4936	1375	548	45
STATEE	1.00000	0.10003	0.10198	0.14120
Satisfaction Statement E		0.0002	0.0168	0.3549
	4949	1369	549	45
CHNGFCMA	0.10003	1.00000	0.62898	0.71024
Change Score FCM A: Motor Speech	0.0002		<.0001	<.0001
	1369	9679	1052	189
CHNGFCMB	0.10198	0.62898	1.00000	0.56072
Change Score FCM B: Voice	0.0168	<.0001		<.0001
	549	1052	3374	85
CHNGFCMC	0.14120	0.71024	0.56072	1.00000
Change Score FCM C: Fluency	0.3549	<.0001	<.0001	
	45	189	85	465
CHNGFCMD	0.09773	0.50836	0.52031	0.39062
Change Score FCM D: Swallowing	<.0001	<.0001	<.0001	<.0001
	2026	5109	1490	112
CHNGFCME	0.03719	0.61592	0.55672	0.66290
Change Score FCM E: Spoken Language Comprehension	0.1455	<.0001	<.0001	<.0001
	1534	3439	630	169
CHNGFCMF	0.04159	0.71216	0.60725	0.59445
Change Score FCM F: Spoken Language Expression	0.0883	<.0001	<.0001	<.0001
	1680	3570	633	187

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCMD	CHNGFCME	CHNGFCMF	CHNGFCMG
STATEA Satisfaction Statement A	0.15603 <.0001 2032	0.04793 0.0602 1538	0.07041 0.0038 1691	0.05101 0.1595 762
STATEB Satisfaction Statement B	0.17303 <.0001 2018	0.12633 <.0001 1533	0.13750 <.0001 1687	0.07907 0.0291 762
STATEC Satisfaction Statement C	0.11169 <.0001 2020	0.04396 0.0852 1534	0.03577 0.1419 1687	0.02215 0.5418 761
STATED Satisfaction Statement D	0.14506 <.0001 2022	0.04569 0.0736 1534	0.05972 0.0141 1688	0.06254 0.0849 760
STATEE Satisfaction Statement E	0.09773 <.0001 2026	0.03719 0.1455 1534	0.04159 0.0883 1680	0.02464 0.4982 758
CHNGFCMA Change Score FCM A: Motor Speech	0.50836 <.0001 5109	0.61592 <.0001 3439	0.71216 <.0001 3570	0.46884 <.0001 1195
CHNGFCMB Change Score FCM B: Voice	0.52031 <.0001 1490	0.55672 <.0001 630	0.60725 <.0001 633	0.42329 <.0001 256
CHNGFCMC Change Score FCM C: Fluency	0.39062 <.0001 112	0.66290 <.0001 169	0.59445 <.0001 187	0.48723 <.0001 95
CHNGFCMD Change Score FCM D: Swallowing	1.00000  19498	0.49234 <.0001 4659	0.49283 <.0001 4571	0.33567 <.0001 1028
CHNGFCME Change Score FCM E: Spoken Language Comprehension	0.49234 <.0001 4659	1.00000  11805	0.73797 <.0001 9475	0.53232 <.0001 2655
CHNGFCMF Change Score FCM F: Spoken Language Expression	0.49283 <.0001 4571	0.73797 <.0001 9475	1.00000  12248	0.58858 <.0001 2892

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCMH	CHNGFCMI	CHNGFCMJ	CHNGFCMK
STATEA Satisfaction Statement A	0.03075 0.3331 993	0.04260 0.1388 1209	0.10570 <.0001 1849	0.10830 0.0378 368
STATEB Satisfaction Statement B	0.06505 0.0404 993	0.08311 0.0038 1209	0.14236 <.0001 1849	0.14375 0.0057 369
STATEC Satisfaction Statement C	0.07118 0.0250 991	0.06823 0.0177 1209	0.07589 0.0011 1847	0.08194 0.1166 368
STATED Satisfaction Statement D	0.04878 0.1245 993	0.02978 0.3012 1207	0.09217 <.0001 1845	0.06608 0.2066 367
STATEE Satisfaction Statement E	0.02492 0.4349 984	0.00504 0.8615 1200	0.08329 0.0003 1843	0.04473 0.3935 366
CHNGFCMA Change Score FCM A: Motor Speech	0.47761 <.0001 1505	0.57445 <.0001 1681	0.52016 <.0001 2410	0.60877 <.0001 581
CHNGFCMB Change Score FCM B: Voice	0.38740 <.0001 263	0.55834 <.0001 480	0.43968 <.0001 690	0.51489 <.0001 195
CHNGFCMC Change Score FCM C: Fluency	0.50551 <.0001 96	0.17301 0.1112 86	0.44562 <.0001 121	0.33680 0.0360 39
CHNGFCMD Change Score FCM D: Swallowing	0.38022 <.0001 1404	0.48101 <.0001 2670	0.42484 <.0001 3216	0.46320 <.0001 716
CHNGFCME Change Score FCM E: Spoken Language Comprehension	0.62819 <.0001 3626	0.67892 <.0001 3203	0.64685 <.0001 4286	0.70689 <.0001 1021
CHNGFCMF Change Score FCM F: Spoken Language Expression	0.61285 <.0001 3612	0.65903 <.0001 2955	0.61390 <.0001 4003	0.69040 <.0001 955

## The CORR Procedure

Pearson Correlation  
Coefficients  
Prob > |r| under H0: Rho=0  
Number of Observations

	STATEA	STATEB	STATEC	STATED
CHNGFCMG	0.05101	0.07907	0.02215	0.06254
Change Score FCM G: Writing	0.1595	0.0291	0.5418	0.0849
	762	762	761	760
CHNGFCMH	0.03075	0.06505	0.07118	0.04878
Change Score FCM H: Reading	0.3331	0.0404	0.0250	0.1245
	993	993	991	993
CHNGFCMI	0.04260	0.08311	0.06823	0.02978
Change Score FCM I: Attention	0.1388	0.0038	0.0177	0.3012
	1209	1209	1209	1207
CHNGFCMJ	0.10570	0.14236	0.07589	0.09217
Change Score FCM J: Memory	<.0001	<.0001	0.0011	<.0001
	1849	1849	1847	1845
CHNGFCMK	0.10830	0.14375	0.08194	0.06608
Change Score FCM K: Pragmatics	0.0378	0.0057	0.1166	0.2066
	368	369	368	367

Pearson Correlation  
Coefficients  
Prob > |r| under H0: Rho=0  
Number of Observations

	STATEE	CHNGFCMA	CHNGFCMB	CHNGFCMC
CHNGFCMG	0.02464	0.46884	0.42329	0.48723
Change Score FCM G: Writing	0.4982	<.0001	<.0001	<.0001
	758	1195	256	95
CHNGFCMH	0.02492	0.47761	0.38740	0.50551
Change Score FCM H: Reading	0.4349	<.0001	<.0001	<.0001
	984	1505	263	96
CHNGFCMI	0.00504	0.57445	0.55834	0.17301
Change Score FCM I: Attention	0.8615	<.0001	<.0001	0.1112
	1200	1681	480	86
CHNGFCMJ	0.08329	0.52016	0.43968	0.44562
Change Score FCM J: Memory	0.0003	<.0001	<.0001	<.0001
	1843	2410	690	121



## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	STATEE	CHNGFCMA	CHNGFCMB	CHNGFCMC
CHNGFCMK	0.04473	0.60877	0.51489	0.33680
Change Score FCM K: Pragmatics	0.3935	<.0001	<.0001	0.0360
	366	581	195	39

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCMD	CHNGFCME	CHNGFCMF	CHNGFCMG
CHNGFCMG	0.33567	0.53232	0.58858	1.00000
Change Score FCM G: Writing	<.0001	<.0001	<.0001	
	1028	2655	2892	3836
CHNGFCMH	0.38022	0.62819	0.61285	0.65559
Change Score FCM H: Reading	<.0001	<.0001	<.0001	<.0001
	1404	3626	3612	2903
CHNGFCMI	0.48101	0.67892	0.65903	0.59486
Change Score FCM I: Attention	<.0001	<.0001	<.0001	<.0001
	2670	3203	2955	1212
CHNGFCMJ	0.42484	0.64685	0.61390	0.56278
Change Score FCM J: Memory	<.0001	<.0001	<.0001	<.0001
	3216	4286	4003	1524
CHNGFCMK	0.46320	0.70689	0.69040	0.63748
Change Score FCM K: Pragmatics	<.0001	<.0001	<.0001	<.0001
	716	1021	955	489

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCMH	CHNGFCMI	CHNGFCMJ	CHNGFCMK
CHNGFCMG	0.65559	0.59486	0.56278	0.63748
Change Score FCM G: Writing	<.0001	<.0001	<.0001	<.0001
	2903	1212	1524	489
CHNGFCMH	1.00000	0.64212	0.59884	0.63161
Change Score FCM H: Reading		<.0001	<.0001	<.0001
	5439	1881	2440	706

## The CORR Procedure

## Pearson Correlation Coefficients

Prob &gt; |r| under H0: Rho=0

Number of Observations

	CHNGFCMH	CHNGFCMI	CHNGFCMJ	CHNGFCMK
HNGFCM	0.64212	1.00000	0.72152	0.74497
hange Score FCM I: Attentio:	<.0001		<.0001	<.0001
	1881	8094	5827	1661
HNGFCM	0.59884	0.72152	1.00000	0.69680
hange Score FCM J: Memor:	<.0001	<.0001		<.0001
	2440	5827	11339	1673
HNGFCM	0.63161	0.74497	0.69680	1.00000
hange core FCM K: Pragmatics	<.0001	<.0001	<.0001	
	706	1661	1673	2255

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1401	85.01%
-6	0	.00%	1	247	100.00%
-5	0	.00%	-7	0	100.00%
-4	0	.00%	-6	0	100.00%
-3	0	.00%	-5	0	100.00%
-2	0	.00%	-4	0	100.00%
-1	0	.00%	-3	0	100.00%
0	1401	85.01%	-2	0	100.00%
1	247	100.00%	-1	0	100.00%
2	0	100.00%	2	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 1

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1575	95.57%
-6	0	.00%	1	56	98.97%
-5	0	.00%	-1	11	99.64%
-4	0	.00%	-2	3	99.82%
-3	2	.12%	-3	2	99.94%
-2	3	.30%	2	1	100.00%
-1	11	.97%	-7	0	100.00%
0	1575	96.54%	-6	0	100.00%
1	56	99.94%	-5	0	100.00%
2	1	100.00%	-4	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 2

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>
-7	0	.00%	0	1361	82.58%
-6	0	.00%	-1	240	97.15%
-5	0	.00%	1	33	99.15%
-4	0	.00%	4	8	99.64%
-3	0	.00%	-2	3	99.82%
-2	3	.18%	2	3	100.00%
-1	240	14.75%	-7	0	100.00%
0	1361	97.33%	-6	0	100.00%
1	33	99.33%	-5	0	100.00%
2	3	99.51%	-4	0	100.00%
3	0	99.51%	-3	0	100.00%
4	8	100.00%	3	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 3

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1466	88.96%
-6	0	.00%	1	150	98.06%
-5	0	.00%	2	30	99.88%
-4	0	.00%	3	1	99.94%
-3	0	.00%	6	1	100.00%
-2	0	.00%	-7	0	100.00%
-1	0	.00%	-6	0	100.00%
0	1466	88.96%	-5	0	100.00%
1	150	98.06%	-4	0	100.00%
2	30	99.88%	-3	0	100.00%
3	1	99.94%	-2	0	100.00%
4	0	99.94%	-1	0	100.00%
5	0	99.94%	4	0	100.00%
6	1	100.00%	5	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 4

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1573	95.45%
-6	0	.00%	-1	46	98.24%
-5	0	.00%	1	19	99.39%
-4	0	.00%	2	8	99.88%
-3	1	.06%	-3	1	99.94%
-2	0	.06%	3	1	100.00%
-1	46	2.85%	-7	0	100.00%
0	1573	98.30%	-6	0	100.00%
1	19	99.45%	-5	0	100.00%
2	8	99.94%	-4	0	100.00%
3	1	100.00%	-2	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 5

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1626	98.67%
-6	0	.00%	1	18	99.76%
-5	0	.00%	3	3	99.94%
-4	0	.00%	2	1	100.00%
-3	0	.00%	-7	0	100.00%
-2	0	.00%	-6	0	100.00%
-1	0	.00%	-5	0	100.00%
0	1626	98.67%	-4	0	100.00%
1	18	99.76%	-3	0	100.00%
2	1	99.82%	-2	0	100.00%
3	3	100.00%	-1	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 6



<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1596	96.84%
-6	2	.12%	-1	43	99.45%
-5	1	.18%	-2	6	99.82%
-4	0	.18%	-6	2	99.94%
-3	0	.18%	-5	1	100.00%
-2	6	.55%	-7	0	100.00%
-1	43	3.16%	-4	0	100.00%
0	1596	100.00%	-3	0	100.00%
1	0	100.00%	1	0	100.00%
2	0	100.00%	2	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 7

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1621	98.36%
-6	0	.00%	1	14	99.21%
-5	1	.06%	-3	9	99.76%
-4	1	.12%	-1	2	99.88%
-3	9	.67%	-5	1	99.94%
-2	0	.67%	-4	1	100.00%
-1	2	.79%	-7	0	100.00%
0	1621	99.15%	-6	0	100.00%
1	14	100.00%	-2	0	100.00%
2	0	100.00%	2	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 8

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1633	99.09%
-6	0	.00%	1	6	99.45%
-5	0	.00%	5	5	99.76%
-4	0	.00%	6	3	99.94%
-3	0	.00%	4	1	100.00%
-2	0	.00%	-7	0	100.00%
-1	0	.00%	-6	0	100.00%
0	1633	99.09%	-5	0	100.00%
1	6	99.45%	-4	0	100.00%
2	0	99.45%	-3	0	100.00%
3	0	99.45%	-2	0	100.00%
4	1	99.51%	-1	0	100.00%
5	5	99.82%	2	0	100.00%
6	3	100.00%	3	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 9

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1599	97.03%
-6	0	.00%	-1	29	98.79%
-5	0	.00%	1	11	99.45%
-4	1	.06%	-2	8	99.94%
-3	0	.06%	-4	1	100.00%
-2	8	.55%	-7	0	100.00%
-1	29	2.31%	-6	0	100.00%
0	1599	99.33%	-5	0	100.00%
1	11	100.00%	-3	0	100.00%
2	0	100.00%	2	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 10

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1460	88.59%
-6	0	.00%	-1	165	98.60%
-5	0	.00%	-2	9	99.15%
-4	1	.06%	-3	8	99.64%
-3	8	.55%	1	4	99.88%
-2	9	1.09%	-4	1	99.94%
-1	165	11.10%	2	1	100.00%
0	1460	99.70%	-7	0	100.00%
1	4	99.94%	-6	0	100.00%
2	1	100.00%	-5	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 11

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1555	94.36%
-6	0	.00%	1	78	99.09%
-5	0	.00%	4	7	99.51%
-4	0	.00%	2	4	99.76%
-3	0	.00%	-1	3	99.94%
-2	0	.00%	3	1	100.00%
-1	3	.18%	-7	0	100.00%
0	1555	94.54%	-6	0	100.00%
1	78	99.27%	-5	0	100.00%
2	4	99.51%	-4	0	100.00%
3	1	99.58%	-3	0	100.00%
4	7	100.00%	-2	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 12

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1538	93.33%
-6	0	.00%	1	50	96.36%
-5	1	.06%	-1	49	99.33%
-4	0	.06%	2	9	99.88%
-3	0	.06%	-5	1	99.94%
-2	1	.12%	-2	1	100.00%
-1	49	3.09%	-7	0	100.00%
0	1538	96.42%	-6	0	100.00%
1	50	99.45%	-4	0	100.00%
2	9	100.00%	-3	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 13

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1568	95.15%
-6	1	.06%	1	51	98.24%
-5	0	.06%	-1	20	99.45%
-4	0	.06%	-3	8	99.94%
-3	8	.55%	-6	1	100.00%
-2	0	.55%	-7	0	100.00%
-1	20	1.76%	-5	0	100.00%
0	1568	96.91%	-4	0	100.00%
1	51	100.00%	-2	0	100.00%
2	0	100.00%	2	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 14



<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1426	86.53%
-6	0	.00%	-1	183	97.63%
-5	0	.00%	1	27	99.27%
-4	2	.12%	-3	8	99.76%
-3	8	.61%	-4	2	99.88%
-2	1	.67%	-2	1	99.94%
-1	183	11.77%	2	1	100.00%
0	1426	98.30%	-7	0	100.00%
1	27	99.94%	-6	0	100.00%
2	1	100.00%	-5	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 15

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	0	.00%	0	1608	97.57%
-6	0	.00%	2	15	98.48%
-5	0	.00%	1	12	99.21%
-4	0	.00%	-1	10	99.82%
-3	0	.00%	-2	3	100.00%
-2	3	.18%	-7	0	100.00%
-1	10	.79%	-6	0	100.00%
0	1608	98.36%	-5	0	100.00%
1	12	99.09%	-4	0	100.00%
2	15	100.00%	-3	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 16

<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative%</i>
-7	3	.18%	0	1623	98.48%
-6	9	.73%	-1	13	99.27%
-5	0	.73%	-6	9	99.82%
-4	0	.73%	-7	3	100.00%
-3	0	.73%	-5	0	100.00%
-2	0	.73%	-4	0	100.00%
-1	13	1.52%	-3	0	100.00%
0	1623	100.00%	-2	0	100.00%
1	0	100.00%	1	0	100.00%
2	0	100.00%	2	0	100.00%
3	0	100.00%	3	0	100.00%
4	0	100.00%	4	0	100.00%
5	0	100.00%	5	0	100.00%
6	0	100.00%	6	0	100.00%
7	0	100.00%	7	0	100.00%
More	0	100.00%	More	0	100.00%

Distribution of Errors on Vignette Number 17