

Stress Survey Test Manual

Asha H. Golveo

CSU East Bay

Psychology 370 - Psychological Measurement

Construct

Stress can be defined as the body's reaction to physical, mental, or emotional stressors.

Stress can be produced by everyday activities, a traumatic event, or sick occurrence.

There are two dimensions of stress, physical symptoms and mental symptoms. Physical symptoms induce chemical changes in the body, which can result in increased blood pressure, heart rate, and blood sugar levels. Mental symptoms may cause irritation, worry, rage, or sadness. Stress is related to fear in the way that your body physically releases hormones like cortisol and adrenaline. However, fear is the anticipation, while stress is the symptoms while the stressor is ongoing.

Likert scale: 1. Never. 2. Sometimes. 3. Often. 4. Almost Always

Purpose

The test can be applied in work or school settings which are notorious causes of stress for many people. When administered at work, employers can use the information as a data point to measure employee satisfaction. A highly stressed employee could be in the midst of burnout, in which it would be advantageous for their manager to understand the cause of stress, and hopefully mitigate the stress before the employee decides to leave the company. When administered in a school setting, the information could be used to understand the effectiveness of campus student services or to identify the need for more.

Method of Study

The study was conducted on March 6, 2023 in an upper division Psychology course at CSU East Bay. The sample (N=27) included students in the class and the instructor. The participants varied in age, gender, and ethnicity.

Survey

Below is the test administered to participants:

Read the following items and circle the rating that best applies to that item.

1. I feel depressed.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

2. I get anxious.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

3. I feel joyful.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

4. I can't focus in school.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

5. I worry.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

6. I have nightmares.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

7. I feel worried about not doing the right thing.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

8. I feel guilty.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

9. I snap at people.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

10. I enjoy life.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

11. I handle personal problems well.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always

12. I feel irritable.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

13. I feel like my mind is racing.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

14. My life is out of control.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

15. I become angry when things do not work by my expectations.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

16. I cope well with my life stressors.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

17. I fear the outcome of events.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

18. I have lapses in memory.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

19. I experience difficulty breathing.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

20. I experience muscle ache.
1.Never. 2.Sometimes. 3.Often. 4. Almost Always.

21. I experience indigestion or heartburn.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

22. I experience jaw clenching.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

23. I binge eat.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always

24. I skip meals.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

25. I experience fatigue.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

26. I feel relaxed.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

27. I have trouble sleeping.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

28. I get headaches.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

29. I have low energy.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

30. My heart races.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

31. My body shakes from nervousness.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

32. I feel content about my life.
1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

33. I experience panic attacks.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

34. I feel tense.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

35.I bite my nails.

1.Never. 2.Sometimes. 3.Often. 4.Almost Always.

Basic Validity Check

The descriptive statistics for test items indicate low variability and no errors in data entry. The minimum values are within our range of 1 to 4. Thirty-two out of thirty-five questions have a standard deviation lower than 1.0, and only three are slightly above 1.0. No items with a standard deviation of zero were found. Zero would indicate that all participants chose the same answer to the question. We did not have to delete any items.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Q1	27	1	4	2.15	.718
Q2	27	1	4	2.37	.629
Q3	27	1	4	2.70	.775
Q4	27	1	4	2.19	.879
Q5	27	2	4	2.70	.724
Q6	27	1	3	1.67	.620
Q7	27	1	4	2.44	.892
Q8	27	1	4	1.93	.781
Q9	27	1	4	1.89	.751
Q10	27	1	4	3.11	.801
Q11	27	2	4	2.93	.781
Q12	27	1	4	2.15	.602
Q13	27	1	4	2.19	.834
Q14	27	1	4	1.78	.698
Q15	27	1	4	2.22	.751
Q16	27	1	4	2.63	.884
Q17	27	1	4	2.48	.802
Q18	27	1	4	2.04	1.018
Q19	27	1	4	1.52	.802
Q20	27	1	4	2.30	.869
Q21	27	1	4	1.96	.980
Q22	27	1	4	1.85	.989
Q23	27	1	4	2.00	1.038
Q24	27	1	4	2.04	.940
Q25	27	1	4	2.44	.847
Q26	27	2	4	2.59	.572
Q27	27	1	4	2.19	1.001
Q28	27	1	4	1.81	.622
Q29	27	1	4	2.33	.961
Q30	27	1	4	1.78	.751
Q31	27	1	4	1.63	.792
Q32	27	1	4	2.96	.808
Q33	27	1	4	1.59	.694
Q34	27	1	3	2.04	.706
Q35	27	1	4	1.44	.892
Valid N (listwise)	27				

The descriptive statistics for participants indicate low variability and no errors in data entry. The minimum values are within our range of 1 to 4. The standard deviations all fall around 1.0, with only two that are slightly above. Zero would indicate that a participant chose the same answer to every question. We did not have to delete any participants.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
var001	35	1.00	4.00	2.1429	.84515
var002	35	1.00	4.00	1.9429	.68354
var003	35	1.00	4.00	2.3714	.91026
var004	35	1.00	4.00	2.2000	.75926
var005	35	1.00	4.00	1.9429	.99832
var006	35	1.00	4.00	2.3429	.63906
var007	35	1.00	4.00	2.4000	1.06274
var008	35	1.00	4.00	2.1143	.90005
var009	35	1.00	4.00	1.9143	.70174
var010	35	1.00	4.00	1.8571	.94380
var011	35	1.00	4.00	1.8571	.80961
var012	35	1.00	4.00	1.7143	.89349
var013	35	1.00	4.00	2.2857	1.01667
var014	35	1.00	4.00	2.4571	.95001
var015	35	1.00	4.00	2.2571	.91853
var016	35	1.00	3.00	1.9714	.51368
var017	35	1.00	4.00	3.4857	.91944
var018	35	1.00	3.00	2.0000	.76696
var019	35	1.00	4.00	2.0857	.78108
var020	35	1.00	4.00	2.2000	.99410
var021	35	1.00	3.00	2.0571	.68354
var022	35	1.00	4.00	2.4000	.77460
var023	35	1.00	4.00	1.9429	.83817
var024	35	1.00	4.00	2.3714	.94202
var025	35	1.00	4.00	1.8000	.86772
var026	35	1.00	4.00	2.4000	.73565
var027	35	1.00	4.00	2.1429	.84515
Valid N (listwise)	35				

Reversing the Data

The survey included six items that were reverse scored. Five of the six questions (3, 10, 11, 16, 32) are reverse scored for mental symptoms. Question 26 is reverse scored for physical symptoms. To reverse the data in SPSS, I selected “Transform” then “Recode Into Different Variables”. I recoded 1 to 4, 2 to 3, 3 to 2, and 4 to 1.

Factor Analysis

To obtain the factor analysis I selected “Dimension Reduction” from the “Analyze” tab in SPSS, then chose the option “Factor”. Under “Descriptives”, I chose “Coefficients” and “Significance Levels”. Under “Extraction”, I chose “Principal components” and selected the “Scree Plot” option. Under “Extract”, I selected “Fixed number of factors” and entered 2 for the number of factors. Under “Rotation”, I chose “Promax.” Under “Options”, I chose “Sort by Size”

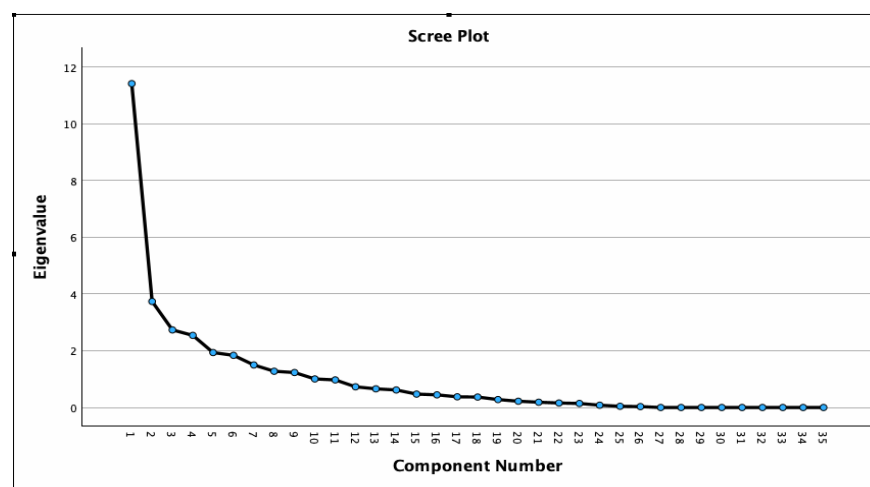
The Total Variance Explained table identified 10 components with eigenvalues greater than or equal to 1.0. Although I chose to extract 2 factors based on the 2 dimensions we created, SPSS found 10 factors. Two factors account for 43.291% of total variance.

Total Variance Explained							
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	11.415	32.613	32.613	11.415	32.613	32.613	9.573
2	3.737	10.677	43.291	3.737	10.677	43.291	9.513
3	2.734	7.812	51.103				
4	2.542	7.263	58.366				
5	1.936	5.531	63.897				
6	1.838	5.253	69.149				
7	1.499	4.283	73.433				
8	1.277	3.650	77.082				
9	1.232	3.521	80.603				
10	1.007	2.876	83.480				
11	.972	2.778	86.258				
12	.729	2.082	88.340				
13	.658	1.879	90.219				
14	.618	1.765	91.984				
15	.472	1.349	93.334				
16	.446	1.273	94.607				
17	.377	1.076	95.683				
18	.368	1.052	96.736				
19	.280	.799	97.535				
20	.221	.630	98.165				
21	.186	.532	98.697				
22	.158	.452	99.149				
23	.143	.408	99.557				
24	.081	.230	99.787				
25	.043	.122	99.909				
26	.032	.091	100.000				
27	8.170E-16	2.334E-15	100.000				
28	6.453E-16	1.844E-15	100.000				
29	4.437E-16	1.268E-15	100.000				
30	1.010E-16	2.884E-16	100.000				
31	-7.301E-17	-2.086E-16	100.000				
32	-1.969E-16	-5.627E-16	100.000				
33	-4.142E-16	-1.184E-15	100.000				
34	-6.181E-16	-1.766E-15	100.000				
35	-7.844E-16	-2.241E-15	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

The scree plot is a line plot of the eigenvalues of factors. Below plot shows two factors to retain.



The pattern matrix shows the factor loading of each item onto the factors. I chose two factors with a factor loading of .44. Factor 1 is mental stress, and Factor 2 is physical stress.

Pattern Matrix^a		
	Component	
	1	2
Q10R	.887	-.334
Q32R	.833	-.207
Q29	.827	-.159
Q3R	.815	.016
Q1	.748	.182
Q17	.747	-.151
Q11R	.743	-.216
Q2	.639	.119
Q14	.592	.329
Q33	.589	.344
Q25	.581	.036
Q30	.561	.273
Q26R	.506	-.227
Q6	.499	.078
Q31	.440	.371
Q7	-.376	.824
Q8	-.106	.813
Q12	.009	.723
Q22	-.043	.700
Q9	-.085	.686
Q18	-.143	.677
Q23	-.042	.639
Q20	.062	.591
Q19	-.128	.590
Q28	.247	.557
Q24	.034	.552
Q16R	.119	.524
Q27	-.148	.518
Q15	.184	.518
Q13	.242	.442
Q35	-.229	.435
Q5	.300	.403
Q4	.045	.401
Q34	.349	.388
Q21	.169	.311

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.^a

a. Rotation converged in 3 iterations.

Internal Consistency

Items in Factor 1 have an alpha reliability of .920. This shows that the items have an excellent internal consistency in measuring the physical stress dimension. Items in Factor 2 have an alpha reliability of .885. Although the alpha reliability is lower in Factor 2 than Factor 1, items in Factor 2 still show a very good internal consistency. A Cronbach's alpha of .70 and above is considered good internal consistency.

Reliability

Scale: Factor 1

Case Processing Summary			
		N	%
Cases	Valid	27	100.0
	Excluded ^a	0	.0
	Total	27	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics

Cronbach's Alpha	N of Items
.920	15

Reliability

Scale: Factor 2

Case Processing Summary			
		N	%
Cases	Valid	27	100.0
	Excluded ^a	0	.0
	Total	27	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics

Cronbach's Alpha	N of Items
.885	15

Computing the Test Scores and Identifying Low, Medium, and High Scorers

The 33rd and 67th percentiles were calculated by SPSS for each factor. Each participant was also given a total score for each factor. Participants with a total score equal to or lower than the 33rd percentile value were grouped as low scorers. Participants with a total score equal to or higher than the 67th percentile

value were grouped as high scorers. Participants with a total score between the 33rd and 67th percentile values were grouped as medium scorers. An equal distribution should result in 9 participants per group. However, the groupings resulted in an unequal number of participants. To create an equal distribution, participants with scores near the borderline of the percentile values were reassigned total scores to group them into the next category.

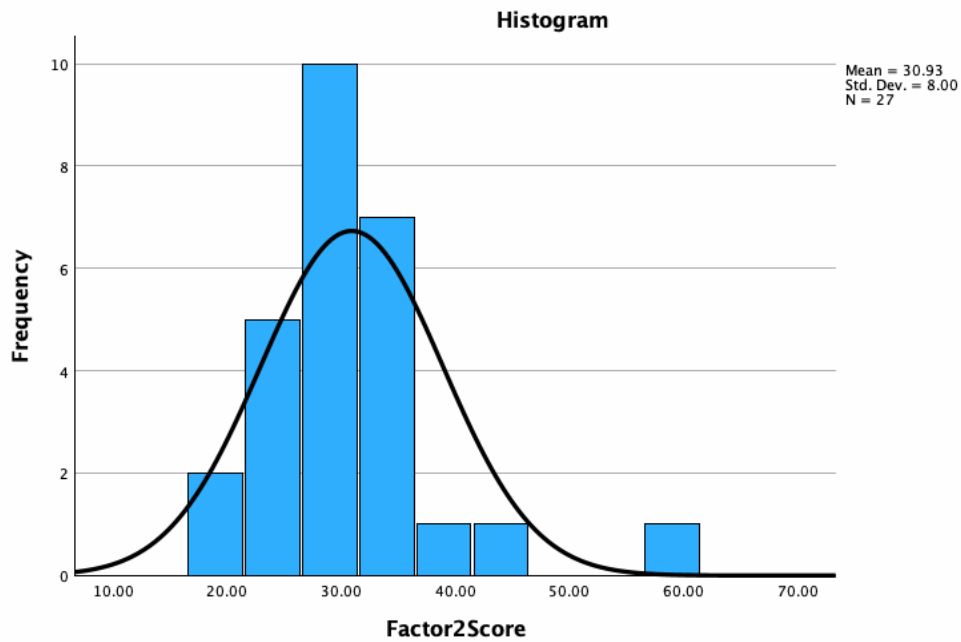
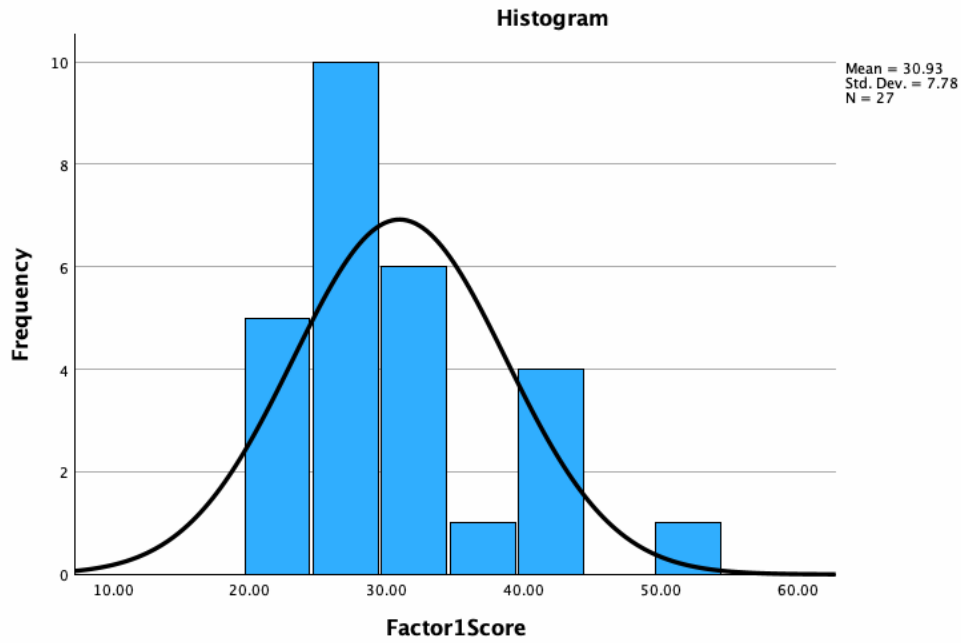
Statistics		
Factor1Score		
N	Valid	27
	Missing	0
Mean		30.9259
Median		29.0000
Mode		26.00
Std. Deviation		7.78028
Minimum		22.00
Maximum		54.00
Percentiles	33	26.0000
	67	32.5200

Factor1Score					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	22.00	2	7.4	7.4	7.4
	23.00	1	3.7	3.7	11.1
	24.00	2	7.4	7.4	18.5
	25.00	1	3.7	3.7	22.2
	26.00	5	18.5	18.5	40.7
	27.00	1	3.7	3.7	44.4
	28.00	1	3.7	3.7	48.1
	29.00	2	7.4	7.4	55.6
	31.00	3	11.1	11.1	66.7
	33.00	1	3.7	3.7	70.4
	34.00	2	7.4	7.4	77.8
	37.00	1	3.7	3.7	81.5
	40.00	1	3.7	3.7	85.2
	41.00	1	3.7	3.7	88.9
	43.00	2	7.4	7.4	96.3
	54.00	1	3.7	3.7	100.0
	Total	27	100.0	100.0	

Statistics		
Factor2Score		
N	Valid	27
	Missing	0
Mean		30.9259
Median		29.0000
Mode		28.00 ^a
Std. Deviation		7.99964
Minimum		19.00
Maximum		59.00
Percentiles	33	28.0000
	67	33.7600

a. Multiple modes exist. The smallest value is shown

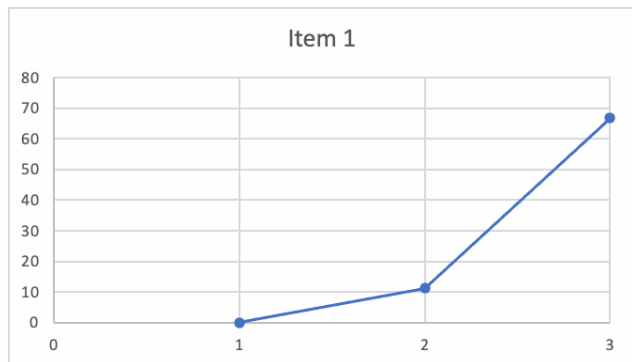
Factor2Score					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19.00	1	3.7	3.7	3.7
	20.00	1	3.7	3.7	7.4
	22.00	1	3.7	3.7	11.1
	23.00	1	3.7	3.7	14.8
	25.00	2	7.4	7.4	22.2
	26.00	1	3.7	3.7	25.9
	27.00	1	3.7	3.7	29.6
	28.00	3	11.1	11.1	40.7
	29.00	3	11.1	11.1	51.9
	31.00	3	11.1	11.1	63.0
	33.00	1	3.7	3.7	66.7
	34.00	2	7.4	7.4	74.1
	35.00	1	3.7	3.7	77.8
	36.00	3	11.1	11.1	88.9
	37.00	1	3.7	3.7	92.6
	44.00	1	3.7	3.7	96.3
	59.00	1	3.7	3.7	100.0
	Total	27	100.0	100.0	



Individual Item Characteristics

Factor 1

1. I feel depressed - good



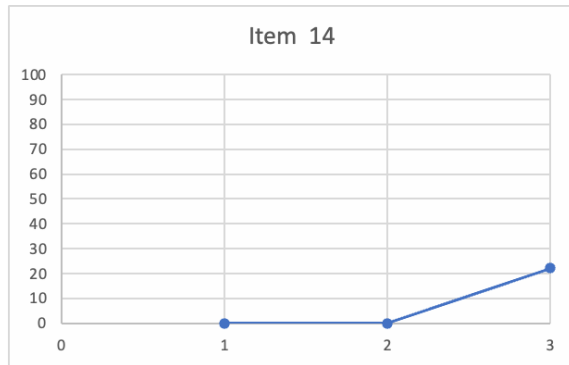
2. I get anxious - good



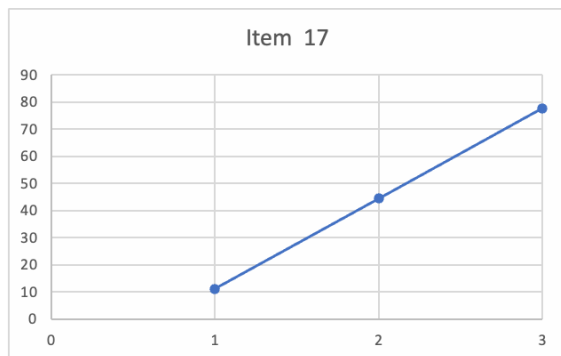
6. I have nightmares - bad (poor discrimination)



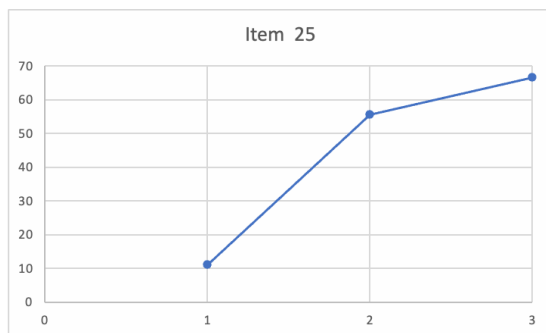
14. My life is out of control - bad (poor discrimination)



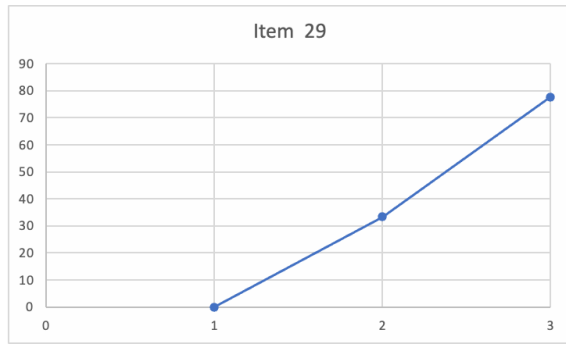
17. I fear the outcome of events - good



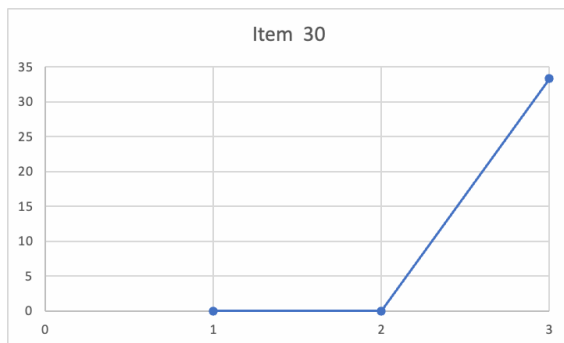
25. I experience fatigue - good



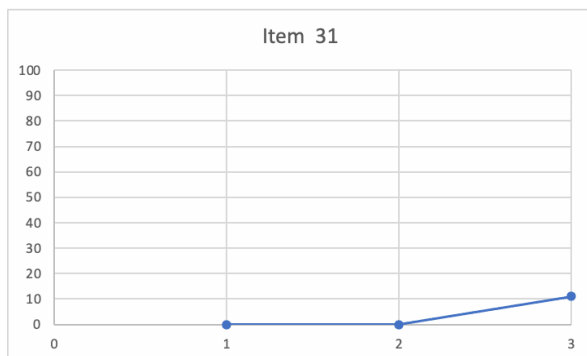
29. I have low energy - good



30. My heart races - good



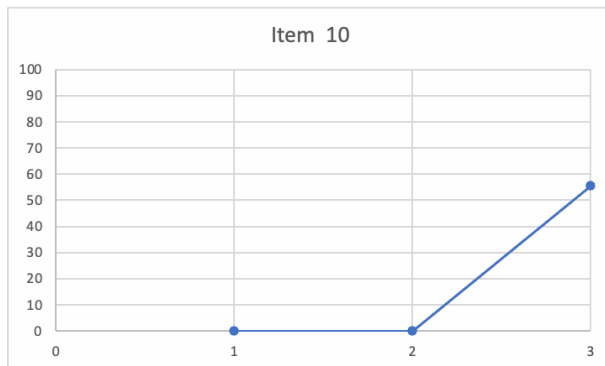
31. My body shakes from nervousness - bad (poor discrimination)



3. I feel joyful - good



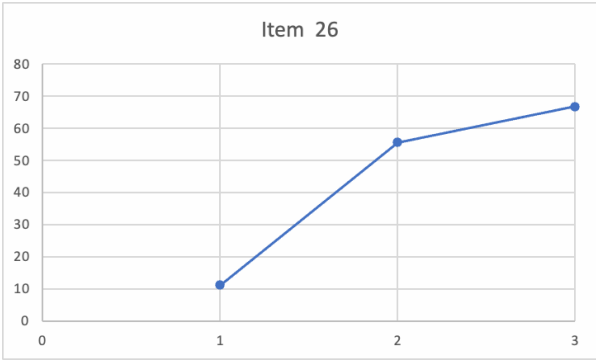
10. I enjoy life - good



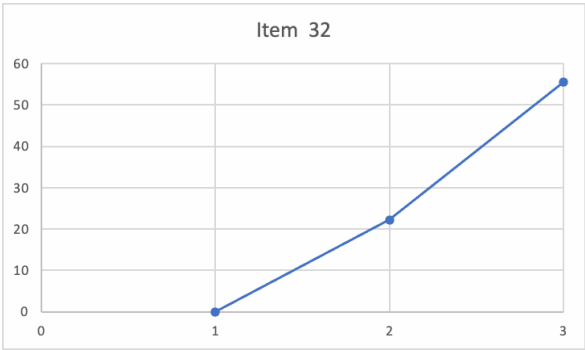
11. I handle personal problems well - good



26. I feel relaxed - good

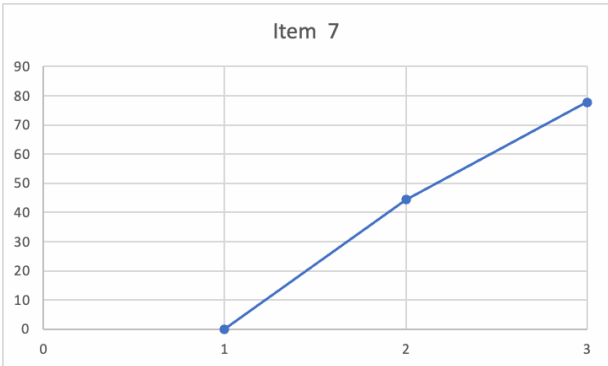


32. I feel content about my life - good



Factor 2

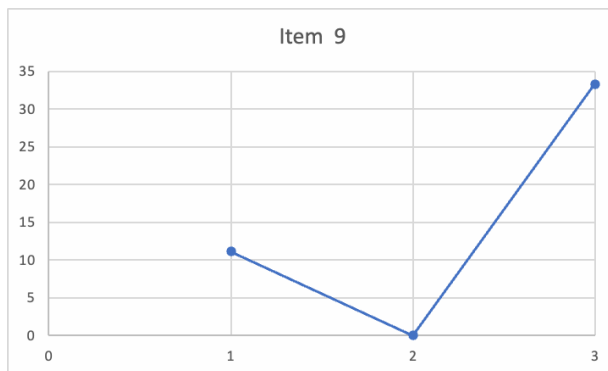
7. I feel worried about not doing the right thing - good



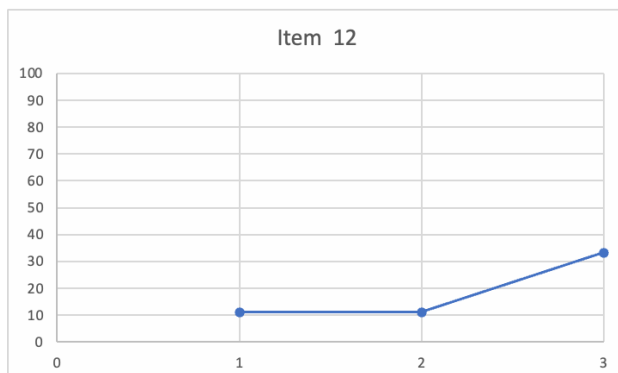
8. I feel guilty - good



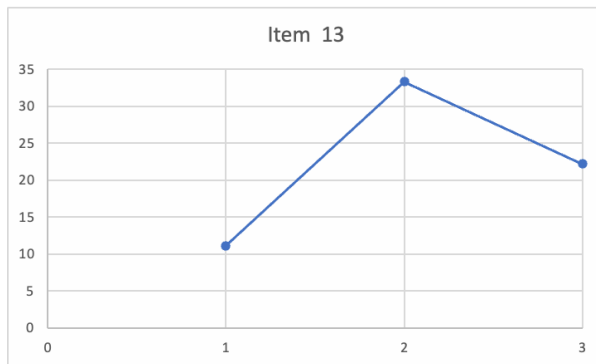
9. I snap at people - bad (non-monotonic)



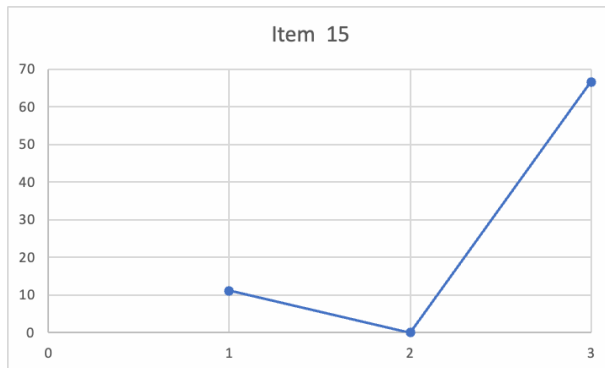
12. I feel irritable - bad (poor discrimination)



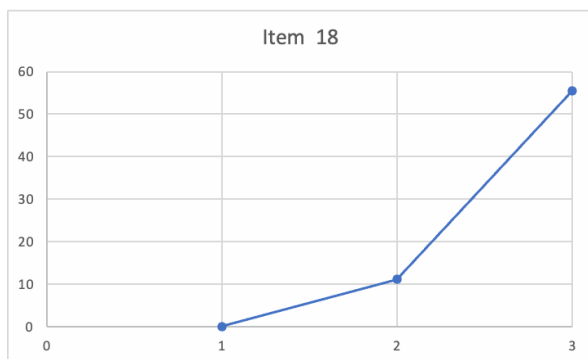
13. I feel like my mind is racing - bad (non-monotonic)



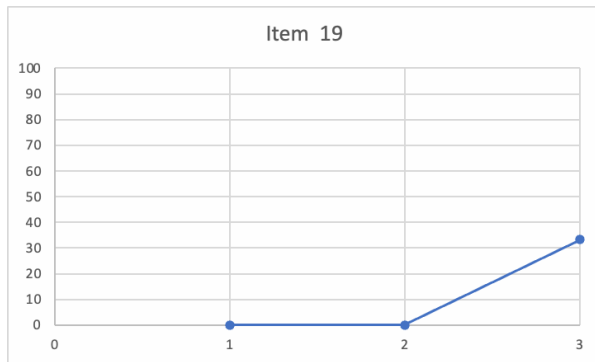
15. I become angry when things do not work by my expectations - bad (non-monotonic)



18. I have lapses in memory - good



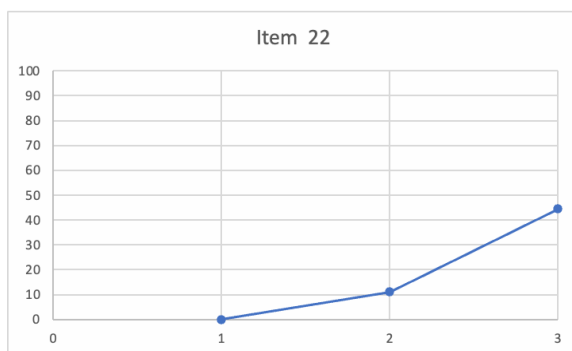
19. I experience difficulty breathing - good



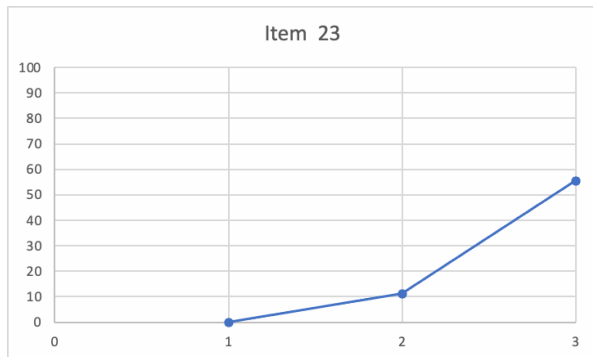
20. I experience muscle ache - good



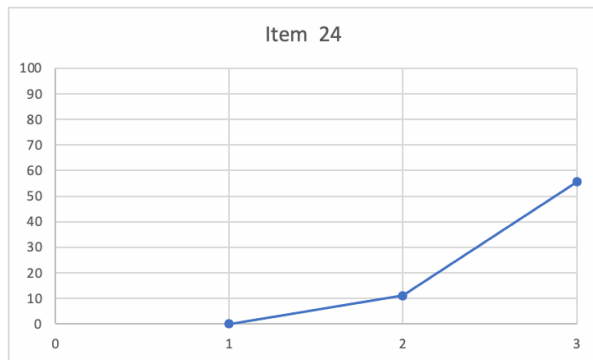
22. I experience jaw clenching - good



23. I binge eat - good



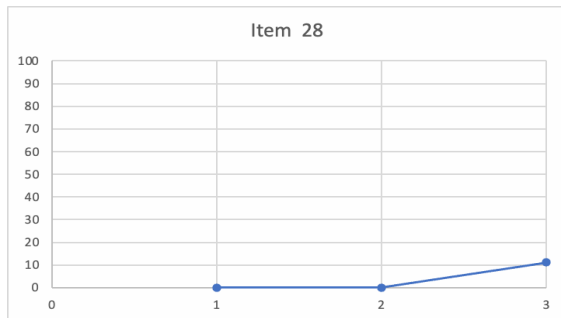
24. I skip meals - good



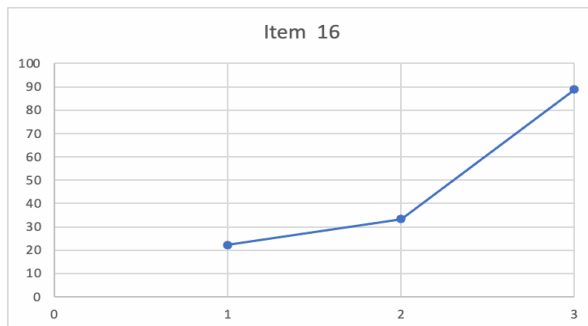
27. I have trouble sleeping - good



28. I get headaches - bad (poor discrimination)



16. I cope well with my life stressors - good



Final Internal Consistency Reliability Measures and Distribution

I removed item 6, 14, and 31 from Factor 1. I removed 9, 12, 13, 15 and 28 from Factor 2.

Removing the bad items lowered internal consistency. Alpha reliability for Factor 1 dropped from .920 to .779 and Factor 2 dropped from .885 to .847. Internal consistency reliability is still considered good because they are over .70.

Scale: Updated Factor 1

Case Processing Summary

		N	%
Cases	Valid	27	100.0
	Excluded ^a	0	.0
	Total	27	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.779	11

Scale: Updated Factor 2

Case Processing Summary

		N	%
Cases	Valid	27	100.0
	Excluded ^a	0	.0
	Total	27	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.847	10

Conclusions

Analysis of the stress survey results show that most items have a good correlation to the dimensions we chose: mental stress or physical stress. Our internal consistency was high, and the survey would be considered reliable to assess stress in an individual. When comparing the pattern matrix with the item questions, I believe some items didn't fit with the factor they were assigned to. Items 25 and 30 were grouped in the mental stress dimension but I would characterize them as physical stress. Items 15 and 16 were grouped in the physical stress factor but I would characterize them as mental stress. A next step that I would take is to re-write the items that did not fit their dimensions, as well as the items below the minimum factor loading of .44. After re-reading those items, I realized that the statements were not as easily definable between physical or mental stress. Another next step would be to use this test on a different sample known to have a high probability of stress, such as in a work setting. College students are known to have high levels of stress, which made CSUEB students a good sample for the survey. In future applications of the survey, I would use samples of college students that are not Psychology majors. I think that Psychology students affect the results by the demand characteristics they display when taking the survey.