



The factor structure of the 4-item Perceived Stress Scale in English adolescents

DOI:

[10.1027/1015-5759/a000562](https://doi.org/10.1027/1015-5759/a000562)

Document Version

Accepted author manuscript

[Link to publication record in Manchester Research Explorer](#)

Citation for published version (APA):

Demkowicz, O., Panayiotou, M., Ashworth, E., Humphrey, N., & Deighton, J. (2019). The factor structure of the 4-item Perceived Stress Scale in English adolescents. *European Journal of Psychological Assessment*. Advance online publication. <https://doi.org/10.1027/1015-5759/a000562>

Published in:

European Journal of Psychological Assessment

Citing this paper

Please note that where the full-text provided on Manchester Research Explorer is the Author Accepted Manuscript or Proof version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version.

General rights

Copyright and moral rights for the publications made accessible in the Research Explorer are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Takedown policy

If you believe that this document breaches copyright please refer to the University of Manchester's Takedown Procedures [<http://man.ac.uk/04Y6Bo>] or contact uml.scholarlycommunications@manchester.ac.uk providing relevant details, so we can investigate your claim.



The Factor Structure of the Four-Item Perceived Stress Scale in English Adolescents

Ola Demkowicz*, Margarita Panayiotou*, Emma Ashworth*, Neil Humphrey*, and
Jessica Deighton†

*Manchester Institute of Education, the University of Manchester, UK

†Evidence Based Practice Unit (EBPU), University College London and the Anna Freud
National Centre for Children and Families, UK

Word count: 2,922

Table 1: Descriptive Statistics and PSS-4 Item Frequencies.

Figure 1: Factor Structures for the PSS-4.

Author note

The data used in this study were collected as part of the HeadStart learning programme and supported by funding from the National Lottery Community Fund. The content is solely the responsibility of the authors and it does not necessarily reflect the views of the National Lottery Community Fund. The authors declare that they have no conflict of interest.

Correspondence concerning this article should be addressed to Ola Demkowicz, Manchester Institute of Education, The University of Manchester, UK. E-mail: ola.demkowicz@manchester.ac.uk

ORCID ID: 0000-0001-9204-0912

Running head: PSS-4 FACTOR STRUCTURE IN ADOLESCENTS

1 Summary

2 This study investigated the factor structure, internal consistency, and known-groups validity
3 of the four-item Perceived Stress Scale in a large sample of 29,388 English adolescents.
4 Results indicated that the original unidimensional structure was not viable and instead
5 provided support for a two-factor structure. Examination of a bifactor- $(S - 1)$ model
6 indicated that this multidimensionality can be attributed to reverse-worded items; however,
7 beyond method effects, these factors appear to capture distinct, though inter-related,
8 constructs. As this multidimensional structure relies on two-item factors, we advise use of
9 longer versions of this measure where possible.

10
11 *Keywords:* perceived stress, coping, adolescence, reverse-worded items, bifactor modeling

26 The Factor Structure of the Four-Item Perceived Stress Scale in English Adolescents

27

28 Stress is a salient issue in adolescence, a period encompassing many potentially
29 stressful biological and sociocultural changes (Arnett, 1999). Current perspectives emphasise
30 the need to measure *perceived stress* as appraised by the individual, as opposed to the
31 presence of stressors (Lazarus & Folkman, 1984). Here, we examine the four-item version of
32 the Perceived Stress Scale (PSS) in an adolescent sample. The PSS was developed by Cohen,
33 Kamarck, and Mermelstein (1983) to assess the extent to which individuals appraise their
34 lives as “unpredictable, uncontrollable, and overloading”, relative to their ability to cope (p.
35 387).

36 The original PSS-14, comprising seven positively- and seven negatively-worded items,
37 was reported to be a better predictor of health outcomes than objective stressful life-event
38 scales (Cohen et al., 1983) and has been found to be reliable across various populations,
39 including adolescents (e.g., Nguyen-Rodriguez, Chou, Unger, & Spruijt-Metz, 2008; Zhang,
40 Yan, Zhao, & Yuan, 2014). Originally proposed as unidimensional, later validation indicated
41 two factors: *perceived distress* and *perceived coping* (Hewitt, Flett, & Shawn, 1992).

42 Ten-item (PSS-10) and four-item (PSS-4) versions have also been developed
43 (Cohen et al., 1983). The brevity of the PSS-4 makes it attractive for studies with large
44 samples, time limitations, and repeated measurement, but validation remains limited.
45 Evidence suggests mixed findings for internal consistency, with Cronbach’s α frequently
46 found to be below the standard .70 threshold (Lee, 2012). The PSS-4 was proposed as
47 unidimensional, but examination of its factor structure is rare and has produced mixed
48 findings, with support for a one-factor (Lesage, Berjot, & Deschamps, 2012; Mitchell, Crane,
49 & Kim, 2008) and two-factor (Leung, Lam, & Chan, 2010) structure, or both in the same
50 sample (González-Ramírez et al., 2013; Wu & Amtmann, 2013). Across all PSS versions,

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75

where a two-factor solution is found, it corresponds to groups of positively- and negatively-worded items. This is unsurprising, as reverse-worded items have been shown to interfere with scale reliability and factor structure, potentially creating a multifactorial structure (Wang, Chen, & Jin, 2015).

To date, the factor structure of the PSS-4 has not been examined with adolescents and the influence of reverse-worded items on its dimensionality has not been explored. We set out to explore the factor structure, internal consistency, and known-groups validity of this measure in an adolescent sample, with attention to the influence of reverse-worded items.

Method

Data were drawn from a major longitudinal research project focused on the mental health and wellbeing of 30,843 young people, attending 114 education settings across six disadvantaged areas of England. Areas were selected in part based on the high proportion of households and neighbourhoods living in deprivation. Education settings across these areas take part in the main research project and pupils complete a number of measures annually to facilitate evaluation.

Sample

Participants with missing data on all four PSS items ($n = 1,455$) were excluded from analysis. The final sample included 29,388 adolescents aged 11–16 ($M = 13.31$, $SD = 1.10$). 52.2% of participants were female ($n = 15,505$). Ethnicity reflected the national pattern (Department for Education [DfE] & Office for National Statistics [ONS], 2017); the majority of participants were White (74.2%), followed by Asian (9.6%), Black (5.7%), mixed (3.9%), other/unclassified (2.6%) and Chinese (0.2%). Remaining participants had incomplete data (3.8%). Free school meal eligibility (15.8%) was slightly higher than national levels (14%; DfE & ONS, 2017). 10.8% of participants were identified as having special educational needs, slightly lower than the national average (14.4%; DfE & ONS, 2017).

76 Measures

1
2 77 **PSS-4.** Participants rate four items (e.g., “in the last month, how often have you felt
3
4
5 78 that you were unable to control the important things in your life?”; Cohen et al., 1983) on a
6
7 79 five-point scale, from 0 to 4 (never, almost never, sometimes, often, and very often,
8
9
10 80 respectively). The second and third items are reverse-scored, and items are summed to create
11
12 81 a total score, where a higher score indicates greater perceived stress. Evidence on the internal
13
14 82 consistency of PSS has been mixed, with Cronbach’s α values often lower than .70 (Lee,
15
16
17 83 2012). It was shown to have good convergent validity with measures of mental health
18
19 84 constructs (Jovanović & Gavrilov-Jerković, 2015; Karam et al., 2012), though this has not
20
21
22 85 been investigated in adolescents.

24 86 **Strengths and Difficulties Questionnaire (SDQ; emotional problems subscale).**

25
26
27 87 Participants rate five items (e.g., “I worry a lot”) on a three-point scale from 0 (“somewhat
28
29 88 true”) to 2 (“certainly true”), summing a total score of 0–10. Research has shown acceptable
30
31
32 89 psychometric properties for this subscale, demonstrating satisfactory internal consistency and
33
34 90 inter-rater reliability (Goodman, Meltzer, & Bailey, 1998). The SDQ can be used as a
35
36
37 91 screening instrument to detect child psychopathology (Goodman et al., 1998). For known-
38
39 92 groups analysis, we classified participants scoring 7 or higher as experiencing abnormal
40
41 93 levels of emotional problems (SDQ Info, 2016).

43 94 **Analysis**

44
45
46 95 Confirmatory factor analysis (CFA) was used to explore one-factor (overall perceived
47
48
49 96 stress); two-factor (perceived distress and perceived coping); and bifactor- $(S - 1)$ models (see
50
51 97 Figure 1). A bifactor- $(S - 1)$ model specifies a general factor and a specific factor, but with
52
53 98 one less specific factor than theorized (Eid, Geiser, Koch, & Heene, 2017). Bifactor- $(S - 1)$
54
55
56 99 models are less susceptible to anomalous results compared to classic bifactor models (Eid et
57
58 100 al., 2017; Heinrich, Zagorscak, Eid, & Knaevelsrud, 2018). The approach allows isolation of
59
60
61
62
63
64
65

101 method effects and has been used to examine the effects of reverse wording on
102 multidimensionality (Gnambs & Staufenbiel, 2018; Zhang et al., 2016). Models were
103 examined in Mplus 8.2 with weighted least squares means and variance adjusted (WLSMV)
104 estimation to account for the categorical nature of items (Brown, 2015). Type = complex was
105 used to control for data clustering across schools (mean cluster = 257.79; intracluster
106 correlations = .007–.012). Root mean square error of approximation (RMSEA) below .06,
107 standardized root mean squared residual (SRMR) below .08, and comparative fit index (CFI)
108 and Tucker-Lewis index (TLI) values above .95 were considered to indicate acceptable
109 model fit (Hu & Bentler, 1999). For Model 3, latent correlations were fixed to 0 (Eid et al.,
110 2017), and loadings for the specific factor were constrained to equality to allow model
111 identification.

112 Internal consistency was assessed using McDonald's ω and Cronbach's α . The latter
113 was used to allow comparison with the greater literature. Independent t-tests were conducted
114 to assess known-groups validity, or the degree to which the PSS-4 could discriminate
115 between groups with and without abnormal levels of emotional problems, consistent with
116 evidence of an association (e.g., Hewitt et al., 1992).

117 Results

118 Table 1 presents descriptive statistics, bivariate correlations and item frequencies.
119 Bivariate correlations indicated acceptable values below the .70 threshold for
120 multicollinearity (Tabachnick & Fidell, 2013). No normality violations were identified and
121 floor and ceiling effects were not excessive. Little's (1988) missing completely at random
122 test was significant at the .001 alpha level and missing values for survey items (0.6–2.1%)
123 were assumed missing at random.

124 Figure 1 displays factor loadings and factor correlations. The fit of the one-factor
125 model (Model 1; $\chi^2(2) = 2469.70, p < .001$; RMSEA = .21, 90% CI [.20, .21], $p < .001$;

126 SRMR = .08; CFI = .89, TLI = .66) was poor, with large residual correlations (>.10) and
127 inconsistent loadings. The two-factor structure (Model 2) showed acceptable fit: (χ^2 (1) =
128 104.16, $p < .001$; RMSEA = .06, 90% CI [.05, .07], $p = 1.00$; SRMR = .01; CFI = 1.00, TLI
129 = .97).

130 The bifactor-($S - 1$) model (Model 3) showed the same fit to that of the two-factor
131 model, as these were equivalent. Salient factor loadings (> .40) were observed for items 2
132 and 3 onto the specific method factor, indicating covariance that could be attributed to
133 reverse wording. Items 1 and 4 loaded substantially onto the general factor of perceived
134 stress, while reverse-worded items showed loadings below .40.

135 The internal consistency of the one-factor PSS-4 ($\alpha = .62$; $\omega = .63$) was lower than the
136 commonly used threshold of .70 (Terwee et al., 2007); item-total reliability coefficients
137 further supported the poor fit of the unidimensional structure. Values for the two-item
138 perceived distress factor were comparatively higher ($\alpha = .72$; $\omega = .72$), while those for the
139 perceived coping factor were slightly lower ($\alpha = .60$; $\omega = .60$).

140 Known-groups analysis indicated that participants reporting abnormal levels of
141 emotional symptoms (18.4%; $n = 5,408$) scored significantly higher on the unidimensional
142 PSS-4 (t (28,101) = 77.66, $p < .001$, $d = 1.19$; $n = 28,110$); on the two-item perceived distress
143 subscale (t (28,591) = 73.69, $p < .001$, $d = 1.11$; $n = 28,593$); and lower on the two-item
144 perceived coping subscale (t (28,621) = 44.68, $p < .001$, $d = 0.69$; $n = 28,623$).

145 Discussion

146 Results indicate support for a two-factor, rather than unidimensional, structure. The
147 bifactor-($S - 1$) model suggests that reverse-worded items could contribute to
148 multidimensionality, with items loading more strongly on the specific factor of “reverse
149 wording effects”, relative to the general factor, mirroring previous findings for the PSS-10
150 (Perera et al., 2017). However, it is also feasible that, beyond method effects, these factors

151 capture distinct experiences. The correlation between perceived distress and coping was
152 relatively low ($r = .39$) given that these items could also theoretically represent a singular
153 stress construct. Instead, this finding provides support for the conceptualization of these
154 factors as separate, but inter-related, constructs.

155 Overall, findings provide support for a two-factor structure, though it is unclear the
156 extent to which this is attributable to reverse-wording effects, conceptual differences, or both.
157 Both structures were shown to discriminate well between populations with normal and
158 elevated mental health symptoms; however, the reliance on two-item factors leads us to
159 caution against its use. Conceptually, two items may not fully assess a given construct; it is
160 generally recommended that factors should comprise at least three items (Brown, 2015).
161 Statistically, two-item factors must borrow information from other parts of a model (e.g.,
162 items of other measures) in order to be identified, which can lead to distorted parameters and
163 an inability to assess residual correlations (Muthén, 2009). For clinical usage, two-item
164 subscales likely cannot offer an appropriate level of information to support decision-making
165 (Emons, Sijtsma, & Meijer, 2007). Thus, we advise that researchers and practitioners
166 consider use of longer versions of the PSS in order to gather reliable information.

167 **Limitations**

168 We are cautious in our findings of a two-factor structure given the use of two-item
169 factors, which as noted can be problematic. Additionally, our sample may not be
170 representative, as the main project focused on disadvantaged areas.

Electronic Supplementary Material

ESM 1. Unidimensional CFA output (unidimensional.out)

ESM 2. Two-factor CFA output (twofactor.out)

ESM 3. Bifactor-($S - 1$) CFA output (bifactor.out)

ESM 4. Known-groups validity output (groups.spv)

References

Arnett, J. J. (1999). Adolescent storm and stress: Reconsidered. *American Psychologist*, *54*, 317–326.

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). New York, NY: The Guilford Press.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress.

Journal of Health and Social Behavior, *24*, 385–396. <https://doi.org/10.2307/2136404>

Department for Education, & Office for National Statistics. (2017). *Schools, pupils, and their characteristics: January 2017*. Nottingham, United Kingdom: Department for Education.

Eid, M., Geiser, C., Koch, T., & Heene, M. (2017). Anomalous results in G-factor models:

Explanations and alternatives. *Psychological Methods*, *22*, 541–562.

<https://doi.org/10.1037/met0000083>

Emons, W. H. M., Sijtsma, K., & Meijer, R. R. (2007). On the consistency of individual

classification using short scales. *Psychological Methods*, *12*, 105–120.

<https://doi.org/10.1037/1082-989X.12.1.105>

Gnambs, T., & Staufienbiel, T. (2018). The structure of the General Health Questionnaire

(GHQ-12): Two meta-analytic factor analyses. *Health Psychology Review*, *12*, 179–194.

<https://doi.org/10.1080/17437199.2018.1426484>

González-Ramírez, M. T., Rodríguez-Ayán, M. N., & Hernández, R. L. (2013). The

1 Perceived Stress Scale (PSS): Normative data and factor structure for a large-scale
2 sample in Mexico. *Spanish Journal of Psychology*, *16*(e47), 1–9.

3
4
5 <https://doi.org/10.1017/sjp.2013.35>
6

7 Goodman, R., Meltzer, H., & Bailey, V. (1998). The Strengths and Difficulties Questionnaire:
8 A pilot study on the validity of the self-report version. *International Review of*
9
10 *Psychiatry (Abingdon, England)*, *15*, 173–7.

11
12
13
14 <https://doi.org/10.1080/0954026021000046137>
15

16
17 Heinrich, M., Zagorscak, P., Eid, M., & Knaevelsrud, C. (2018). Giving G a meaning: An
18 application of the bifactor-(S-1) approach to realize a more symptom-oriented modeling
19 of the Beck Depression Inventory-II. *Assessment*.

20
21
22
23
24 <https://doi.org/10.1177/1073191118803738>
25

26
27 Hewitt, P. L., Flett, G. L., & Shawn, W. M. (1992). The Perceived Stress Scale: Factor
28 structure and relation to depression symptoms in a psychiatric sample. *Journal of*
29
30 *Psychopathology and Behavioral Assessment*, *14*, 247–257.

31
32
33
34 Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis:
35 Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1–55.

36
37
38
39 <https://doi.org/10.1080/10705519909540118>
40

41 Jovanović, V., & Gavrilov-Jerković, V. (2015). More than a (negative) feeling: Validity of
42 the Perceived Stress Scale in Serbian clinical and non-clinical samples. *Psihologija*,
43
44 *48*(1), 5–18. <https://doi.org/10.2298/PSI1501005J>
45
46
47

48
49 Karam, F., Bérard, A., Sheehy, O., Huneau, M. C., Briggs, G., Chambers, C., ... Wisner, K.
50
51 (2012). Reliability and validity of the 4-item Perceived Stress Scale among pregnant
52 women: Results from the OTIS antidepressants study. *Research in Nursing and Health*,
53
54 *35*(4), 363–375. <https://doi.org/10.1002/nur.21482>
55
56
57

58 Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY:
59
60
61
62
63
64
65

Springer Publishing Company, Inc.

1
2 Lee, E. H. (2012). Review of the psychometric evidence of the Perceived Stress Scale. *Asian*
3
4 *Nursing Research*, 6(4), 121–127. <https://doi.org/10.1016/j.anr.2012.08.004>

5
6
7 Lesage, F. X., Berjot, S., & Deschamps, F. (2012). Psychometric properties of the French
8
9 versions of the Perceived Stress Scale. *International Journal of Occupational Medicine*
10
11 *and Environmental Health*, 25, 178–184. <https://doi.org/10.2478/S13382-012-0024-8>

12
13
14 Leung, D. Y., Lam, T.-H., & Chan, S. S. (2010). Three versions of Perceived Stress Scale:
15
16 Validation in a sample of Chinese cardiac patients who smoke. *BMC Public Health*, 10,
17
18 513. <https://doi.org/10.1186/1471-2458-10-513>

19
20
21 Little, R. J. A. (1988). A test of missing completely at random for multivariate data with
22
23 missing values. *Journal of The American Statistical Association*, 83, 1198–1202.

24
25
26 Mitchell, A. M., Crane, P. A., & Kim, Y. (2008). Perceived stress in survivors of suicide:
27
28 Psychometric properties of the Perceived Stress Scale. *Research in Nursing and Health*,
29
30 31, 576–585. <https://doi.org/10.1002/nur.20284>

31
32
33 Muthén, B. O. (2009). 2 Indicator Latents. Retrieved from
34
35 <http://www.statmodel.com/discussion/messages/11/4965.html?1511909389>

36
37
38 Nguyen-Rodriguez, S. T., Chou, C.-P., Unger, J. B., & Spruijt-Metz, D. (2008). BMI as a
39
40 moderator of perceived stress and emotional eating in adolescents. *Eating Behaviors*, 9,
41
42 238–246. <https://doi.org/10.1016/j.eatbeh.2007.09.001>

43
44
45 Perera, M. J., Brintz, C. E., Birnbaum-Weitzman, O., Penedo, F. J., Gallo, L. C., Gonzalez,
46
47 P., ... Llabre, M. M. (2017). Factor structure of the Perceived Stress Scale-10 (PSS)
48
49 across English and Spanish language responders in the HCHS/SOL sociocultural
50
51 ancillary study. *Psychological Assessment*, 29, 320–328.
52
53
54
55 <https://doi.org/10.1037/pas0000336>

56
57
58 SDQ Info. (2016). Scoring the Strengths and Difficulties Questionnaire for age 4-17 or 18+.

59
60
61
62
63
64
65

Retrieved December 21, 2017, from <http://www.sdqinfo.com/py/sdqinfo/c0.py>

1
2 Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Essex,
3
4 United Kingdom: Pearson Education Limited.
5
6

7 Terwee, C. B., Bot, S. D. M., de Boer, M. R., van der Windt, D. A. W. M., Knol, D. L.,
8
9 Dekker, J., ... de Vet, H. C. W. (2007). Quality criteria were proposed for measurement
10
11 properties of health status questionnaires. *Journal of Clinical Epidemiology*, *60*, 34–42.
12
13 <https://doi.org/10.1016/j.jclinepi.2006.03.012>
14
15

16 Wang, W. C., Chen, H. F., & Jin, K. Y. (2015). Item response theory models for wording
17
18 effects in mixed-format scales. *Educational and Psychological Measurement*, *75*, 157–
19
20 178. <https://doi.org/10.1177/0013164414528209>
21
22

23 Wu, S., & Amtmann, D. (2013). Psychometric evaluation of the Perceived Stress Scale in
24
25 multiple sclerosis. *ISRN Rehabilitation*, *2013*, 9. <https://doi.org/10.1155/2013/608356>
26
27

28 Zhang, B., Yan, X., Zhao, F., & Yuan, F. (2014). The relationship between perceived stress
29
30 and adolescent depression: The roles of social support and gender. *Social Indicators*
31
32 *Research*, *123*, 501–518. <https://doi.org/10.1007/s11205-014-0739-y>
33
34
35

36 Zhang, X., Noor, R., & Savalei, V. (2016). Examining the effect of reverse worded items on
37
38 the factor structure of the need for cognition scale. *PLoS ONE*, *11*, 1–15.
39
40
41 <https://doi.org/10.1371/journal.pone.0157795>
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

Running head: PSS-4 FACTOR STRUCTURE IN ADOLESCENTS

Table 1

Descriptive Statistics and PSS-4 Item Frequencies

	<i>M</i>	<i>SD</i>	Min–Max	Skewness/ Kurtosis	1	2	3	4
1. PSS-4 total score	6.73	3.17	0-16	.18/-.14	–			
2. PSS-4 perceived distress (items 1 and 4)	3.04	2.14	0-8	.35/-.58	.82***	–		
3. PSS-4 perceived coping (items 2 and 3) ¹	3.69	1.88	0-8	.21/-.29	-.76***	-.25***	–	
4. SDQ emotional problems ²			0-10		.55***	.53***	-.33***	–
Item frequencies (%) ³ and item-total correlations	Never	Almost never	Sometimes	Fairly often	Very often		Item-total <i>r</i>	
Item 1: Unable to control the important things	21.8	26	31.4	13.7	7.1		.42	
Item 2 ^R : Confident about ability to handle personal problems	16.2	28.4	31.0	15.8	8.6		.33	
Item 3 ^R : Things were going your way	8.1	23.7	40.8	18.1	9.3		.39	
Item 4: Difficulties were piling up	28.8	25.3	25.2	13.0	7.8		.47	

Note. PSS-4 = four-item Perceived Stress Scale; SDQ = Strengths and Difficulties Questionnaire. ¹ Assessment of the perceived coping subscale treats it in its original format rather than using a reversed version. ² Descriptive and normality statistics are not presented for the SDQ due to its use as a grouping variable rather than a continuous measure.

³ Valid percent frequencies are reported. ^R Items are reverse worded.

*** $p < .001$.

Running head: PSS-4 FACTOR STRUCTURE IN ADOLESCENTS

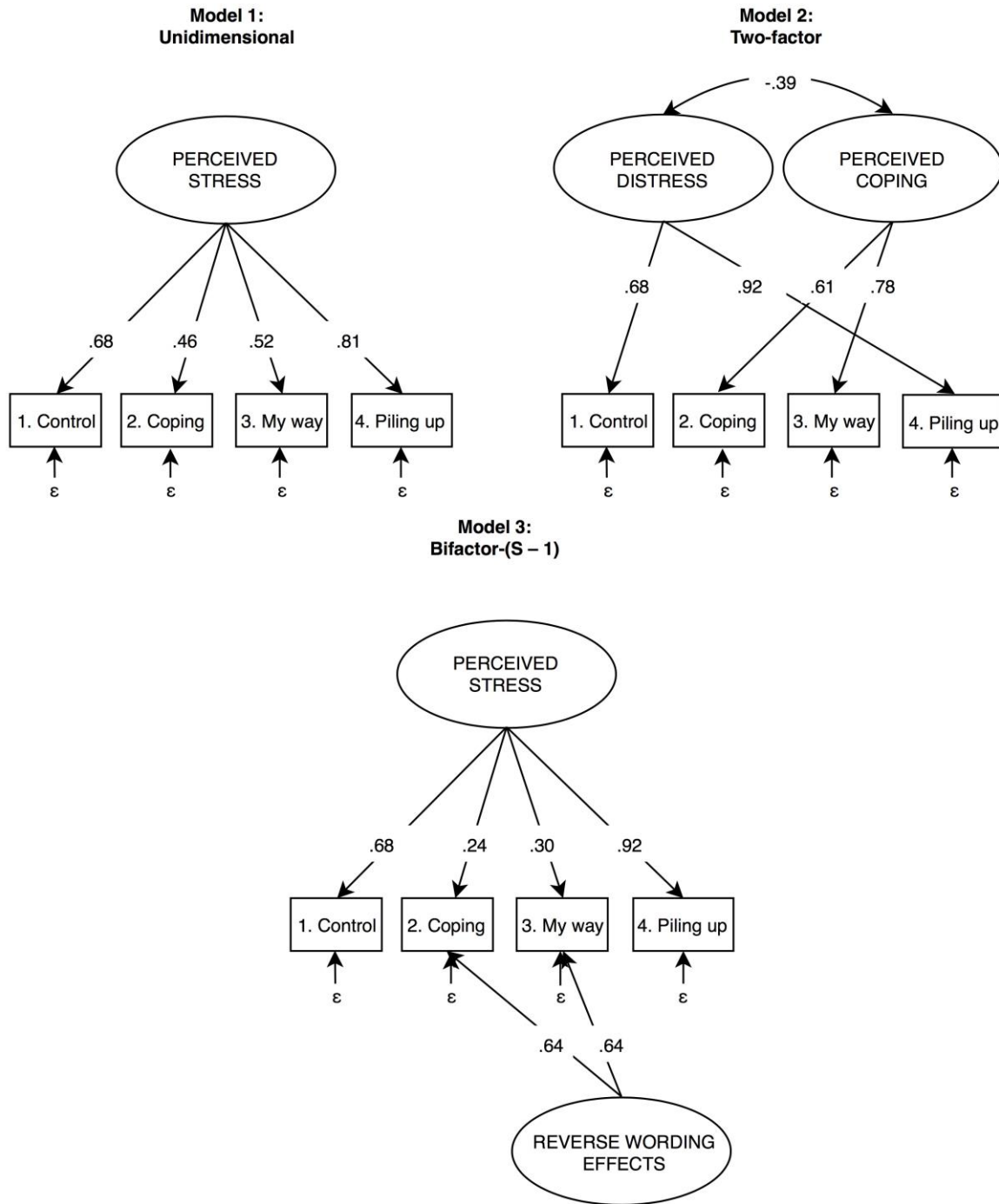


Figure 1. Factor structures for the PSS-4. All parameter estimates significant at the .001 alpha level.