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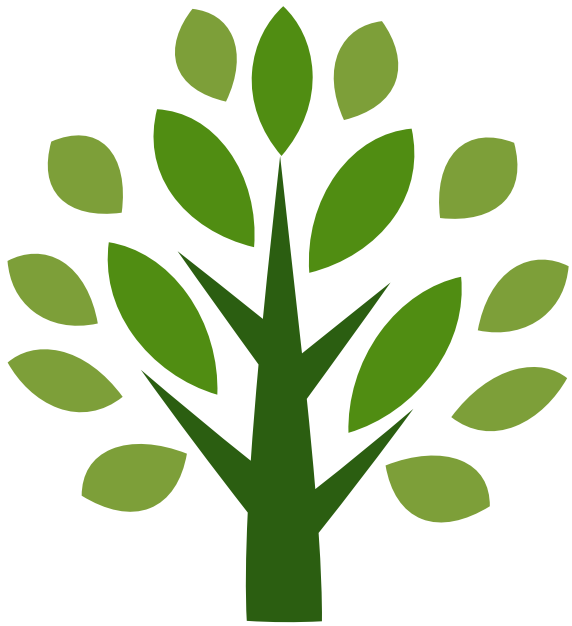
CENTER FOR WORK, HEALTH, AND WELL-BEING

THRIVING FROM WORK QUESTIONNAIRE

SCORING GUIDE



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This guide should be used in conjunction with the Thriving from Work Questionnaire User Manual.

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1. Background

The Thriving from Work Questionnaire was developed in 2016 to measure worker well-being. There is currently a short-form (8 item) and a long-form (30 item) version of the questionnaire. This scoring guide accompanies the Thriving from Work Questionnaire User Manual. To date, the Thriving from Work Questionnaire has been translated and validated in populations of workers in the U.S., Peru, Mexico, and Germany. This guide was developed to assist both researchers and practitioners in scoring the Thriving from Work Questionnaire using some common approaches.

There are a variety of scoring options one may use with the Thriving from Work Questionnaire. The pros and cons of different scoring approaches depend on the goals of the use of the instrument and the context in which the data are collected. We therefore provide technical guidance for multiple scoring options that are available to users of the instrument in different situations.

Table 1: Summary of Scoring Approaches for the Thriving from Work Questionnaire

Approach	Brief Description	Utility
Summed Scoring	This is the sum of each of the items in either the short or long form which provides a continuous scale score between 8-48 for the short form and 30-180 for the long form.	This approach can be used in nearly all circumstances across research and practice. We do not recommend using the score for psychometric studies.
T-test Scoring	This is a way to standardize the scoring by centering the responses around a mean of 50 with a standard deviation of 10.	This can be used in both research and practice settings and is most useful to compare different groups of workers or compare across different research studies.
IRT Model-based Scoring	This is a model-based scoring approach based on item response theory. This scoring approach takes into account the performance and measurement precision of each item in the questionnaire to yield a model-based score.	Most frequently used in research and for psychometric studies where the performance and precision of each of the items is accounted for. We have compared this approach with the summed scoring and T-test scoring approaches. All approaches perform similarly.

2. Summed Scoring Approach

This scoring approach is the most straightforward and can be used for most uses as described in Table 1. In general, we recommend summed scoring for both research and practice purposes.

Note. For structural equation and model-based analyses please refer to the IRT model-based scoring below.

Scoring the Thriving from Work (TfW) Questionnaire is done in the following steps:

a. Determine the number of questions a respondent answered. If someone does not answer all questions a TfW score may still be approximated if enough questions were answered. The fewer questions answered, the poorer the approximation will be. We do not recommend calculating a score for anyone who did not answer at least **7 of the 8 questions on the short form** or **28 of the 30 items on the long form**. Doing so will reduce the accuracy of the approximate TfW score and standard error of measurement.

b. Reverse code items: Reverse code the following items for the long form.

a. I feel excessive levels of stress from my work.
b. I worry that I will get hurt at work.

Note: There are no items that need to be reverse coded on the short form.

c. Sum the numeric values across items. Response options on the TfW questions can be assigned values of your choice, but we recommend assigning the following numeric values:

Never = 1
Rarely = 2
Sometimes = 3
Usually = 4
Almost Always = 5
Always = 6

Although you can theoretically use any numeric values (as long as greater frequency responses are assigned higher values), we recommend using the simpler 1-6 values. This is necessary when using the T-scoring approach (see below). For each worker who has completed the TfW questionnaire, the raw score can be calculated by assigning the corresponding value to their response for each item and summing across all items.

This scoring approach yields a range of scores between 8 and 48 for the short form, and 30 and 180 for the long form.

Prorating scores for missing items

Often when questionnaires are completed respondents may miss completing an item. The summed score approach needs to account for these missing items by imputing a value for the missing item's raw score. Raw scores on either the long- or short-form can be prorated when not all questions were answered. Failure to do so would result in artificially lower scores.

Prorating the score can be done by substituting the missing value with the average (mean) value across the answered items for that person. A simple way to achieve this is to multiply the raw score based on answered items by the total number of items in the TfW questionnaire and dividing by the number of items answered. This score should then be rounded to the nearest whole number.

For example, a worker with a raw summed score of 18 based on 7 of the 8 questions in the short-form would get a prorated score of 18 * 8 / 7 = 20.6 ≈ 21. We do not recommend prorating more than one item for the short form and more than two items on the long form.

3. T- test Scoring Approach

T-scoring, also called look-up scoring, translates a relatively simple raw summed score from the questionnaire (see *Summed Scoring in Section 2*) into a "T-score" with a mean of 50 and a standard deviation of 10. The T-scoring approach enables you to take an individual's score and transform it into a standardized form that is useful if you are comparing across worker populations or across different studies. The major advantages of this approach over simple raw summed scores (*see Section 2*) are that (a) it retains the measurement precision (i.e. standard error of measurement) corresponding to each T-score, and (b) it standardizes scores on a scale that allows for cross-sample and cross-study comparisons.

The steps to generating T-scores are the same as for raw summed scoring, but with a couple of additional steps:

a. Complete steps a-c as described in summed scoring (Page 2). It is important to use the numeric values provided above as it corresponds to the T-value in the look-up table. Using different values will result in inaccurate T-scores.
b. Use the T-score lookup table to translate the raw score into a T-score (see Appendix).
c. Note the corresponding standard error of measurement and/or calculate the 95% confidence interval for a score.

Interpreting T-scores:

The score for both the long- and short-forms of the TfW questionnaire are translated to a T-score which is a standardized score with a mean of 50 and a standard deviation 10. These values are arbitrary but commonly used in the psychometric and assessment fields. The instrument has been developed such that higher scores indicate a greater level of thriving from work.

For example, a worker with a score of 50 indicates a person with an average level of Thriving (relative to our original national validation sample), while a worker with a score of 60 has a greater level of thriving.

No instrument perfectly captures someone's level or score on a latent trait, and it is important to incorporate this uncertainty in scoring. This uncertainty is reflected by a standard error of measurement (SEM) which is provided for each T-score.

The translation of raw summed scores to T-Scores is based on a large national sample of workers in the United States who participated in the validation study of the TfW questionnaire (Peters et al., 2023). As such, scores for a worker may be interpreted relative to this reference population. For example, a worker with a TfW score of 50 can be said to have the same level of thriving as an average worker in a large national reference population. It is important to note that although the reference is a large national sample it cannot be regarded as representative of the overall U.S. worker population. Users of the TfW questionnaire can judge the relevance of comparing the scores from their worker population to this national reference population.

Although the translation of raw scores to T-scores were based on a reference population, it does not have to be interpreted relative to this population. T-scores can also be used to compare groups of workers or individual workers over time without reference to an external population. As such, this scoring methodology may be used regardless of whether the reference population is suitable for a given application of the TfW questionnaire.

4. IRT Model-based Scoring Approach

The long-form and short-form Thriving from Work Questionnaires were validated using a psychometric methodology called item response theory (IRT) that evaluates, among other things, the strength of the relationship between the individual items and the underlying TfW construct. This scoring method incorporates information about the relationship between each item and the underlying TfW construct – in particular different measurement precision at different levels of the TfW trait. This scoring approach is often used in research and is generally considered to be more accurate as it provides a much more informative description of the performance of each item and its precision.

IRT model-based scoring requires some analytical steps which are fully outlined in Appendix B using R-Code. Using the R Code will produce a bifactor model (for the long-form) or unidimensional model (for the short-form), which in turn is used to generate estimated scores for each individual respondent. These scores are standardized: this means the scores are centered around a mean of zero. Standardizing scores makes them easier to interpret and compare across different samples or studies. The standard deviation of these scores is set to one, aligning with standard z-score transformation practices.

The steps to generating the scores are as follows:

a. *Install R & (optionally) R studio:* This is available by downloading R from https://posit.co/download/rstudio-desktop/.

b. *Load your data into R for processing:* This involves reading from an Excel file or another suitable data format where survey responses are stored.
Fit the IRT model(s): Specify the bifactor model for all Thriving from Work items (all 30 items for the long form, 8 items for the short form). This involves specifying how each item relates to the general thriving constructs as well as its specific dimensions like emotional well-being, social well-being, etc. There are several options in R for fitting such models. We use the mirt package.

c. *Score and measurement precision estimation:* Use the provided code to calculate the IRT scores with standard error of measurement (i.e. the precision with which the scores of a given worker has been estimated). Although in R a separate object can be used to store scores, it is good practice to add a new column to your dataset.

Appendix A: T-score Lookup Table

Raw Summed Score	T Score	SEM
8	12.9	4.458
9	15.8	4.011
10	18.1	3.799
11	20	3.658
12	21.7	3.552
13	23.2	3.473
14	24.7	3.415
15	26.1	3.372
16	27.4	3.34
17	28.7	3.317
18	29.9	3.301
19	31.1	3.29
20	32.3	3.284
21	33.5	3.281
22	34.6	3.282
23	35.7	3.284
24	36.9	3.288
25	38	3.293
26	39.1	3.299
27	40.2	3.305
28	41.2	3.311
29	42.3	3.318
30	43.4	3.325
31	44.5	3.333
32	45.7	3.341
33	46.8	3.35
34	47.9	3.358
35	49	3.368
36	50.2	3.379
37	51.4	3.393
38	52.6	3.412
39	53.9	3.436
40	55.2	3.469
41	56.5	3.514
42	58	3.574
43	59.5	3.655
44	61.1	3.759
45	63	3.903
46	65.1	4.102
47	67.7	4.425
48	71.6	5.242

TfW long-form T Score lookup table		
Raw Summed Score	**T Score**	**SEM**
30	15.4	0.518
31	15.4	0.626
32	15.5	0.739
33	15.5	0.872
34	15.6	1.04
35	15.7	1.235
36	15.8	1.436
37	16	1.637
38	16.2	1.836
39	16.4	2.028
40	16.7	2.204
41	17.1	2.358
42	17.4	2.48
43	17.9	2.558
44	18.4	2.59
45	18.9	2.587
46	19.4	2.574
47	19.9	2.577
48	20.4	2.609
49	20.9	2.667
50	21.4	2.743
51	21.8	2.841
52	22.2	2.966
53	22.6	3.117
54	22.9	3.277
55	23.3	3.42
56	23.7	3.521
57	24.2	3.56
58	24.7	3.529
59	25.2	3.433
60	25.8	3.298
61	26.3	3.159
62	26.8	3.048
63	27.2	2.982
64	27.6	2.958
65	28	2.962
66	28.4	2.976
67	28.7	2.985
68	29.1	2.982
69	29.4	2.966
70	29.8	2.938
71	30.1	2.905
72	30.4	2.875

119	**46.1**	**2.981**
120	46.4	2.982
121	46.7	2.983
122	47	2.984
123	47.3	2.987
124	47.7	2.992
125	48	2.997
126	48.3	3.003
127	48.6	3.009
128	49	3.014
129	49.3	3.018
130	49.6	3.02
131	50	3.021
132	50.3	3.021
133	50.7	3.021
134	51	3.022
135	51.4	3.025
136	51.7	3.03
137	52.1	3.038
138	52.4	3.046
139	52.8	3.055
140	53.2	3.064
141	53.6	3.071
142	53.9	3.078
143	54.3	3.085
144	54.7	3.092
145	55.1	3.101
146	55.5	3.111
147	55.8	3.121
148	56.2	3.131
149	56.6	3.14
150	57	3.149
151	57.4	3.16
152	57.8	3.175
153	58.2	3.195
154	58.6	3.222
155	59.1	3.253
156	59.5	3.286
157	60	3.316
158	60.5	3.339
159	61	3.352
160	61.5	3.357
161	62	3.361
162	62.6	3.37
163	63.2	3.389
164	63.8	3.414

165	**64.4**	**3.447**
166	65.1	3.489
167	65.8	3.546
168	66.5	3.623
169	67.3	3.717
170	68.2	3.824
171	69.2	3.95
172	70.4	4.121
173	71.7	4.377
174	73.4	4.724
175	75.3	5.124
176	75.1	4.788
177	74.5	4.772
178	73.7	4.622
179	74.5	4.559
180	75.7	4.482

Appendix B:
R-Code for IRT Model-based Scoring

Coming soon....

Publications & Resources

Thriving from Work: Conceptualization and Measurement

Peters, S.E.; Sorensen, G.; Katz, J.N.; Gundersen, D.A.; Katz, J.N.; Wagner, G.R. Thriving from Work: Conceptualization and Measurement. International Journal of Environmental Research and Public Health 2021. https://doi.org/10.3390/ijerph18137196

Thriving from Work Questionnaire: Dimensionality, Reliability, and Validity of the Long and Short Form Questionnaires

Peters, S.E.; Gundersen, D.A.; Katz, J.N.; Sorensen, G.; Wagner, G.R. Thriving from Work Questionnaire: Dimensionality, Reliability, and Validity of the Long and Short Form Questionnaires. American Journal of Industrial Medicine 2023. https://doi.org/10.1002/ajim.23465

Translation and Validation Publications

Thriving from work questionnaire: Spanish translation and validation

Peters, S.E.; Gundersen, D.A.; Neidlinger, S.M.; Ritchie-Dunham, J.; Wagner, G.R. Thriving from work questionnaire: Spanish translation and validation. BMC Public Health. 2024;24(1):1187. doi.org/10.1186/s12889-024-18173-x

Thriving from work questionnaire: German translation and validation

Neidlinger, S.M.; Peters, S.E.; Gundersen, D.A.; Felfe, J. Thriving from work questionnaire: German translation and validation. BMC Public Health. 2024;24(1):1634. doi.org/10.1186/s12889-024-19037-0

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