Bruce Mallory

RS755: CTT assignment

**A. Reverse-coding the spreadsheet data**

Questions that I reverse coded:

Q6: I wanted to avoid a more complicated major

Q8: I like teachers' work hours

Q10: I like teachers' summer schedule

Q12: Teaching is a high-status profession

Q13: I did not get any other offer for admission to a different program

Q14: Teaching is good preparation for family life

Q17: My parents/ peers thought that this would be the right choice for me

Q19: I don't think of myself as an academic person

Q20: Requirements to become a teacher are more flexible than for other professions

To get a clearer understanding of the “adaptive” construct that the instrument is trying to measure, I looked at the articles by Sinclair, Dowson, and McInerney (2006) and Fokkens-Bruinsma & Canrinus (2012). In both of their descriptions of the “adaptive” construct they focused in on whether the motivation would “provide long-lasting engagement.” To determine if I was going to reverse-code, I focused on whether that motivation (eg. “Teaching is a high-status profession”) would have gotten me through February (the hardest month of the school year for me). If the sentence, “Bruce, you can do this - remember <Q12>!” would NOT have helped in February, then I reverse coded that motivation.

NOTE: There were several students who did not have answers for some of the questions. So in doing the reverse coding, I needed to pay attention to these “blanks” so that I didn’t end up with 5-0=5 as a question score, when it should have been “blank.”

I did not impute values for any of these “blank” question scores.

**B. Initial calculation of Crombach’s alpha**

After reverse-coding items, the calculated alpha for the 23 items was . This was a surprisingly low alpha. And the package flagged ten questions that were negatively correlated with the total scale. They were Q1, 2, 6, 8, 10, 12, 14, 17, 19, and 20.

When I re-ran the alpha calculation with check.keys=TRUE (which ran the alpha calculation using reversed covariances for the ten questions noted above), Cronbach’s alpha increased to .

This difference was surprising, given that I believed that I had correctly coded and reverse-coded the questions. And looking at the ten questions that had been flagged, I could not ascertain a reason that those items were negatively correlated with the instrument as a whole. As a check, I calculated alpha on the raw data with none of the questions reverse coded. This time the calculated alpha was and with check.keys=TRUE. The non-logically coded raw data had a higher internal reliability than my attempt to logically assign the coding directions. This led me to look at removing items from the instrument.

**C. Culling instrument items: first pass**

In my first pass at eliminating some items, I focused on the face validity of individual items and groups of items.

I eliminated Q5(I am more of a doer than a thinker) and Q19(I don't think of myself as an academic person), because I didn’t believe that either of these are motivations for becoming a teacher. Rather, to my ears, these are both versions of the saying “those who can do, those who can’t teach.” A trope that is more of an insult than an explanation of why someone is motivated to teach.

I eliminated Q7(I don’t expect my salary to be the main source of income for my future family), because it involved two assumptions about living-style and family-status that are confounding the underlying motivation. The question should be re-written to focus on whether the respondent sees the financial rewards of teaching as motivational.

I did keep Q8(I like teachers’ workhours), even though it was ambiguous. Likeable “workhours” could be likeable because they are flexible, or they could be likeable because they are minimal. The first interpretation supports an adaptive motivation, while the second is more maladaptive.

My final face validity assessment involved the three questions:

Q2(I like working with adolescents)

Q9(I like working with small children)

Q22(I like working with special need students)

These questions were too precise for the construct. Instead of trying to determine adaptive vs. maladaptive motivations, these questions are asking which students someone wants to teach. Someone with really strong adaptive motivations could answer “Completely True” to one of these and “Completely untrue” to the others.

The last question that I eliminated in my first pass was Q13(I did not get any other offer for admission to a different program). I noticed that of the 82 respondents, all but 1 answered “Completely untrue” to this question. Clearly Q13 has no discriminative value in the instrument, and as such I eliminated it.

With my instrument down to 16 items, the Cronbach’s alpha was . There were just two items that were negatively correlated: Q1(Education should empower people to be their best) and Q21(Education can contribute to the improvement of the lives of underprivileged children/youth). With those items reversed, the alpha value dropped just slightly

**D. Culling instrument items: second pass**

Though reversing Q1 and Q21 did not improve the alpha, I was curious as to why these items flagged. In looking at their means and standard deviations I noticed that these two items were among those with the highest mean and the lowest standard deviation. I also looked at the response frequency to verify that the answers to these two questions were strongly positive and had little variation. The high mean and low standard deviation suggest that these two questions are not doing a lot within the instrument to distinguish between adaptive and maladaptive respondents. These items have low “discriminatory power.”

The item with the lowest mean and lowest standard deviation was Q13, which I had previously eliminated from the instrument because of its lack of discriminatory power.

Looking at the “reliability if dropped” table, I noticed that Q1 or Q21’s elimination from the instrument would improve the internal reliability of the instrument, but not by much (only 0.01), which is insignificant given the size of the 95% CI which is (0.64, 0.80).

The same table suggested that the item that contributed the most to the internal reliability score was Q8(I like teachers’ workhours), since it’s removal would drop alpha by 0.04. This is the same item that I previously flagged as ambiguous. And it is the item that has a mean that is closest to the overall mean with one of the highest item standard deviations. A combination that makes this item discriminatorily powerful.

None of this analysis pushed me to modify the 16-item instrument that I had come to after the first pass at eliminating items. And I determined that Q1 and Q21 had little impact on the overall internal reliability and didn’t need to be removed.

The instrument with the best internal reliability was one where Q2,5,7,9,13,19,22 were eliminated and Q6,8,10,12,13,14,19,20 were reverse-coded.