Technical Research Note

Loss of Meaning in Likert Scaling: A Note on the Q Methodological Alternative

Bruce McKeown, Ph.D.
Westmont College

Abstract: *This paper reports a test of the criticism that scaling techniques have the inherent tendency to obscure the manifold meanings subjects may have when they respond to a scale. Scores received by students on the Christian Orthodoxy Scale are compared to the factor results gained from the same statements used as a Q sort. The Q technique alternative reveals differentiations of meanings not reported in the scale scores.*

Introduction

Q methodologists routinely criticize the use of scaling techniques in R methodological social research. These criticisms are based on: 1) technical issues, for example, "losing" the individuality of respondents through averaging of scores; 2) methodological issues, for example, failing to account for respondent intent and interpretation of scale items and imposing *a priori* meanings external and prior to the respondents' actions on the scale. The problematic nature of scaling in this regard has been addressed in depth by Rhoads and Sun (1994) and recently by Rhoads (2001) in studies of Altemeyer's Right Wing Authoritarianism Scale.

The inherent limitations of scales are compounded when the person-sample is relatively homogeneous and the scale elicits a preponderance of "strongly agree" and "strongly disagree" answers. In such a circumstance, one may find an overwhelming central tendency of the sample on a given attitude but miss the subtle differences of meanings that also exist. Q technique, on the other hand, is an appropriate alternative for revealing the diversity of meaning obscured by scaling methods. This research note illustrates the differences between scalar and Q methodological techniques when applied to a respondent pool notable for its strong consensus on religious belief.

Author's address: Department of Political Science, Westmont College, 955 La Paz Road, Santa Barbara, CA 93108, mckeown@westmont.edu.

Operant Subjectivity, 2001(July), 24(4) 201-206.

Method

Early in the semester, 15 students enrolled in a research methods course completed the Fullerton and Hunsberger Christian Orthodoxy Scale (1982). The scale consists of 24 statements based on theological principles stated in the Apostles' and Nicene creeds. All statements appear in the table of factor arrays. Twelve items are positive statements of Christian belief, for example:

1. God exists as Father, Son, and Holy Spirit.

3. Jesus Christ was the divine Son of God.

17. Jesus was crucified, died, and was buried, but on the third day He arose from the dead.

The 12 other statements are reversed, that is, are contrary to orthodox dogma, for example:

2. Man is *not* a special creature made in the image of God, he is simply a recent development in the process of animal evolution.

6. It is ridiculous to believe that Jesus Christ could be both human and divine.

22. Jesus' death on the cross, if it actually occurred, did nothing in and of itself to save Mankind.

Respondents scored the statements from +3 (strongly agree) to -3 (strongly disagree); no opinion was scored as "0." These scores were converted to a range of 1 (-3) to 7 (+3). Accordingly, the lowest possible summed score for the 24-item scale is 24 (24 × 1) (totally unorthodox) and the highest (most orthodox) is 168 (24 × 7).

Later in the semester, but before the Christian Orthodoxy Scale (CO Scale) results were reported, the students performed a Q sort on the statements in the scale. A Q-sample was constructed from the scale items, and the students sorted them (in a quasi-normal distribution) from +3 (Most Agree) to -3 (Most Disagree). The outer limits of the distribution (+3 and -3) were retained to maintain equivalency with the original scale instructions. In the Q sort version, however, unlike the scalar format, the students were forced to make distinctions among the statements, both *orthodox* and *non-orthodox*. When instructed to perform the Q sort, a common objection was that they agreed or disagreed strongly with many of the items. They were instructed to distinguish between those especially essential to their faith and those that were less essential.

The students were juniors and seniors attending a four-year liberal arts college that makes a strong claim to a Protestant evangelical Christian orientation. Given that many of the students had taken previous courses with the instructor, their political, social, and religious beliefs generally were known; also, the class had completed several other opinion surveys.

Consequently, it is accurate to describe the class, as a group, as being in strong compliance with the character and mission of the college, and to conclude that they were a homogeneous group across a number of issue areas.

Results

The CO Scale results demonstrate the high degree of agreement among the students as well as their adherence to Christian orthodoxy. The mean score was 154.07 with a score distribution of 95-168. The low score (95) was for a student who had left the college, attended a community college, and then returned for the senior year. When asked about the score in a conversation apart from the class, the student indicated a lack of identification with the Bible-believing Christians at the college on most religious issues, although their political opinions were aligned. When the low score is removed, the distribution is 138-168 with a mean score of 158.29 (N = 14). These scores easily fall within the category of "orthodoxy" particularly when compared with Fullerton and Hunsberger's (1982) initial study of university students.

CO Scale Scores and Factor Loadings

ID	*CO Scale Score*	*Factor Loading**		
		1	*2*	*3*
1	138	26	89	-20
2	155	86	24	15
3	167	85	38	-13
4	162	81	47	15
5	165	82	18	-23
6	144	84	19	-06
7	95	-06	-11	96
8	162	81	36	18
9	166	77	50	08
10	168	92	10	-13
11	163	84	23	-18
12	158	82	47	-07
13	164	75	50	04
14	147	86	28	-04
15	157	84	24	-07

**Decimals to 2 places have been omitted. Loadings /0.53/ significant p <0.05.*

Although Fullerton and Hunsberger did not discuss "orthodox" respondents, they described "apostates" (former believers who have left the faith) and "switchers" (those raised in one denomination who have switched to

another). The mean score for "apostates" was 61.8 and the mean score for "switchers" was 130.4. Except for the one student just noted, none of the students in the current sample fall into either of those categories. Nevertheless, given the students' intense religious convictions, one may assume that the CO Scale implicitly encourages "either/or" responses, that is, marking either -3 with the non-orthodox items or +3 with the orthodox items. The question remains, "Does a forced-choice Q sorting technique provide a means for better discerning the distinctions between and the shades of agreement and disagreement within the 2 opposites (orthodoxy and non-orthodoxy)?"

Analysis of the Q sorts resulted in 3 factors. As one might expect, the "outlier" mentioned above, Respondent 7, defined Factor 3. None of the other students loaded significantly on that factor. Similarly, the student with the second lowest score (Respondent 1; score = 138) defined Factor 2. In this instance, however, the factor loadings of 4 other students (Respondents 4, 9, 12, 13) nearly reached significance. Factor 1 was common to the remaining 13 students. Thus, in one respect the results of the CO Scale are supported. There is strong agreement among these Christian students between Christian orthodoxy as measured by the scale and Factor 1, which can be labeled "orthodox." This is reinforced by the 2 lower-scoring students loading separately on different (non-orthodox) factors.

Q technique rescues that which is lost in the scalar approach. The CO Scale results suggest a fundamental commonality of meaning and a common priority across the items (for the respective orthodox and non-orthodox statements). In the scalar approach, there is no information about the relative importance of the statements. There is no differentiation between two statements with which the respondent strongly agrees, although one may be much more important to the individual's religious concept than the other. Using the CO scale, the miracle of water turned into wine holds the same status as Christ's resurrection. However, a differentiation of salience, and thus the meaning of orthodoxy in terms of the essentials, is demonstrated in the factor arrays. Factor 1, the consensus factor, attaches more importance to the life, death, and resurrection of Jesus (Item 15, scored +3) than to the virgin birth (Item 7, scored 0). Christ's second advent (Item 10, scored +2) is more important to these respondents than the miracle of turning water into wine (Item 20, scored 0). Comparable distinctions are found at the negative end of the factor.

The Q sort version of the CO Scale may be criticized for introducing a methodological artifact due to the forced distribution procedure. Because Q sorting usually does not permit the respondents to score the items as freely as Likert scaling does, some critics contend that the resulting factors do not reflect the "natural" behavior of respondents. In this case, however, and as noted earlier, the factors do correspond with the CO Scale scores. High scorers on the CO Scale are located on Factor 1 with the 2 lowest scorers defining

Factor Arrays for Christian Orthodoxy Q Sample

No.	*Statement*	*Factor Scores*		
		1	*2*	*3*
1	God exists as: Father, Son, and Holy Spirit.	2	3	0
2	*Man is not a special creature made in the image of God, he is simply a recent development in the process of animal evolution.	-3	1	1
3	Jesus Christ was the divine Son of God.	3	1	-2
4	The Bible is the word of God given to guide man to grace and salvation.	1	0	0
5	*Those who feel that God answers prayers are just deceiving themselves.	-1	0	-3
6	*It is ridiculous to believe that Jesus Christ could be both human and divine.	0	1	1
7	Jesus was born of a virgin.	0	0	-3
8	*The Bible may be an important book of moral teachings, but it was no more inspired by God than were many other such books in the history of Man.	-1	-1	-3
9	*The concept of God is an old superstition that is no loner needed to explain things in the modern era.	-1	-1	0
10	Christ will return to earth someday.	2	3	0
11	*Most of the religions in the world have miracle stories in their traditions; but there is no reason to believe any of them are true, including those found in the Bible.	-1	1	1
12	God hears all our prayers.	1	-3	3
13	*Jesus Christ may have been a great ethical teacher, as other men have been in history. But he was not the divine Son of God.	-3	-2	2
14	God made man of dust in His own image and breathed life into him.	1	-1	1
15	Through the life, death, and resurrection of Jesus, God provided a way for the forgiveness of man's sins.	3	2	1
16	*Despite what many people believe, there is no such thing as a God who is aware of Man's actions.	-2	-3	-2
17	Jesus was crucified, died, and was buried but on the third day He arose from the dead.	3	3	-3
18	*In all likelihood there is no such thing as a God-given immortal soul in Man which lives on after death.	-2	2	-1
19	*If there ever was such a person as Jesus of Nazareth, he is dead now and will never walk the earth again.	-2	-2	2
20	Jesus miraculously changed real water into real wine.	0	-2	-2
21	There is a God who is concerned with everyone's actions.	1	0	3
22	*Jesus' death on the cross, if it actually occurred, did nothing in and of itself to save Mankind.	-3	-3	-1
23	*There is really no reason to hold to the idea that Jesus was born of a virgin. Jesus' life showed better than anything else	0	1	2
24	The Resurrection proves beyond a doubt that Jesus was the Christ or Messiah of God.	2	2	-1

**Indicates a reversed item on the Christian Orthodoxy Scale*

independent Factors 2 and 3. There is nothing artificial in the factor results. Brown (2001) likens the forced distribution procedure to atom smashing; applying pressure to "force evidence into the open." He correctly points out that the forced distribution compels an operant response that reveals subjective preferences, e.g., statement *x* is more salient than statement *y*. Both statements might have been placed under "most agree" in a Likert-style format or in the absence of a forced-choice situation. Accordingly, important differences in weighting are revealed when compared with the scalar results. This substantiates the claim that within a homogeneous community, where convictions may appear "either/or," the underlying reality is less straightforward.

Inasmuch as the purpose of this paper is technical, substantive interpretations of the 3 factors is beyond its purview. Suffice it to say that Factor 2 (1 respondent loading significantly with 4 mixed loaders with relatively high loadings) is very much in agreement with Factor 1. Yet, there are a few differences. Factor 2 expresses a form of "skeptical Christian humanism." Evolutionary theory is accepted (Item 2), and doubt exists regarding a few other issues (Items 12, 18, and 20). Factor 3 is the sole domain of the student discussed earlier whose CO Scale score falls between the "apostates" and the "switchers." Factor 3 may be interpreted as an indication of modern deism, wherein the existence of God is admitted (Items 12 and 21), but the Christian expression of that belief is rejected or deemed irrelevant (Items 3, 7, 17, 23).

The results of this exercise confirm that scalar item summation scoring techniques can be valid on a macro level; the Christian Orthodoxy Scale is an especially useful device in that regard. However, the Q sort results also reinforce the conclusion of Q methodologists that scaling techniques obfuscate the findings of attitudinal research, because the normative application of scales more often than not misses the wealth and diversity of meanings that a science of subjectivity is particularly adept at discovering.

References

Brown, S.R. 2001, February 6. Q v. Likert, et al. Message posted to Q method electronic mailing list. To retrieve, send electronic message "get q-method log0102" addressed to listserv@listserv.kent.edu.

Fullerton, J.T. and Hunsberger, B. 1982. A unidimensional measure of Christian orthodoxy. *Journal for the Scientific Study of Religion* 21: 317-26.

Rhoads, J.C. 2001. Researching authoritarian personality with Q methodogy Part I: Revisiting traditional analysis. *Operant Subjectivity* 24: 68-85.

Rhoads, J.C. and Sun, T.W. 1994. Studying authoritarianism: Toward an alternative methodology. *Southeastern Political Review* 22: 159-70.