ADVANCED RESEARCH METHODS IN PSYCHOLOGY

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First published 2002 by Routledge
2 Park Square, Milton Park, Abingdon, Oxfordshire OX14 4RN
Simultaneously published in the USA and Canada
by Routledge
711 Third Avenue, New York, NY 10017

First issued in paperback 2014

Routledge is an imprint of the Taylor and Francis Group, an informa business

Typeset in 10/12pt Times by Graphicraft Limited, Hong Kong

Cover design by Lisa Dynan

British Library Cataloguing in Publication Data
A catalogue record for this book is available
from the British Library

Library of Congress Cataloging in Publication Data
Giles, David, 1964–
Advanced research methods in psychology / David C. Giles.
p. cm.
Includes bibliographical references and index.
ISBN 978-0-415-22771-1 (hbk)
ISBN 978-0-415-65346-6 (pbk)
1. Psychology—Research—Methodology. 2. Psychology, Experimental. I. Title.
BF76.5 G55 2002
150′.7′2—dc21 2002190394

17 Q methodology

Q methodology emerged from the same school of psychometrics as factor analysis, but its founder, William Stephenson, viewed it capable of answering radically different questions about the nature of psychology. After its conception in the 1930s, however, it declined in appeal for a while (not being remotely suited to behaviourism!) and has since re-emerged in two separate guises. The technique is the same in both: in the Q-sort, a method which I shall shortly describe; however, there is a distinct difference in the uses it is put to by the British school of Q methodology, who claim it as part of the 'critical' approach to psychology, and the North American school, who use Q-sorts as a standard statistical tool and correlate the data with other scales and measures.

Q methodology: the basic idea

Stephenson (1935) developed Q methodology while working alongside the likes of Spearman and Burt in Britain in the 1930s, at a time when the development of psychometric testing was starting to gain popularity along with the associated technique of factor analysis. The Spearman/Burt approach is often referred to as R methodology, after the correlation statistic that underpins most of the analyses. R methodology was, and is, mainly concerned with identifying differences between individuals from performance on a variety of scales and tests. Factor analysis is performed on the data in order to discover which tests, or items, are related to each other.

The basic idea behind Q methodology involves turning R methodology on its head, so that, rather than studying differences *between* individuals, you study patterns of response *within* individuals. This is achieved by analysing the way a person organises a selection of items, which can be statements about a topic (as in a Likert-type scale), or other stimuli, such as pictures, or a list of names. This activity is known as a Q-sort. Once a number of Q-sorts have been carried out using the same stimuli, the ratings obtained by the different sorts can be entered into the computer and factor analysis can be performed on the data. However, whereas factor analysis in R methodology groups together different measures, in Q methodology it

groups together different sorts, i.e. the cases – the people who have performed the Q-sorts.

As you can imagine, this approach to data collection and analysis requires that we ask quite different questions about psychology than those traditionally studied by R methodologists. R methodology works on the assumption that individuals are characterised by varying quantities of different 'traits' which can be objectively measured – for example, extraversion, or intelligence. Q methodology – like personal construct theory (see Chapter 19) – deals with individuals as active organisers of reality rather than the passive recipients of biology and/or environment. Therefore it is interested in the way the person perceives the world, rather than measuring the existence of hypothesised properties. The factor analysis, sometimes referred to as Q pattern analysis (Stainton Rogers 1995), groups together people who view the world in the same way.

The Q-sort: a worked example

A positive feature of using Q-sorts as a methodological tool is that they are generally much more fun for participants! This may be because, rather than having to select a value from a limited range of responses as in a Likert-type scale, there is an element of creativity in the sorting process (although in effect, it is just a roundabout way of assigning a rating to each item in the study).

What are the most appropriate items for a Q-sort? A typical Q-sort starts life rather like a scale in that a large pool of items needs to be selected, which will eventually be whittled down to a given number for the study itself. If those items are statements concerning a particular topic, then they should be drawn from relevant sources (focus group interviews, perhaps, or press coverage, or even existing scales and questionnaires). It is equally appropriate to use pictorial material (e.g., photographs), or lists of names (e.g., celebrities, or names of countries). Of course, the choice of stimuli depends on the research question.

The next step is to ask participants to sort the items into some form of hierarchy. This is usually done by printing each item on a separate piece of card and asking each participant to organise the cards according to a scale. If the items are statements on a particular topic on which we would expect our participants to have an opinion, such as capital punishment, then we might ask them to sort the statements into piles along a scale from −6 (most disagree) to +6 (most agree). However, some restraints are usually imposed in order to ensure that our data fall into a distribution that approaches normality. Many Q-sorts are performed using a grid that forces participants to organise all the items into a normal distribution; others are more flexible. In some studies participants are required to sort the items into a non-normal distribution; for example, Westen *et al.* (1997: 431) designed a grid resembling 'a flattened right tail of a normal distribution' based on findings from clinical ratings of the same items.

In this worked example, our participants are asked to sort nine chocolate bars (referred to as A, B, C, etc.) in order of preference, to fill the grid in Figure 17.1:

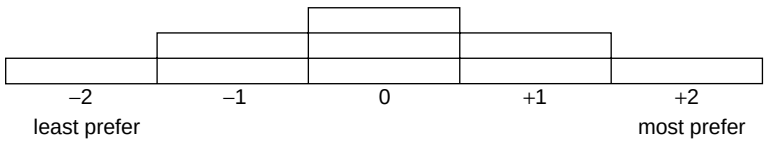

Figure 17.1 Empty grid for Q-sort example

Each participant would need to select one most preferred bar and one least preferred bar, three bars in the neutral pile and then two bars in the moderately preferred and least preferred piles. Most Q-sorts are, of course, more complex than this, using anything up to 100 items, but this example has been chosen for its convenience.

We can then get any number of participants to perform the sort. Generally speaking, it is a good idea to have more participants than items, although one of the features of Q as opposed to R methodology is that the practice of generalising from sample to population is not observed, and so the idea of 'representation' is more flexible. However, we need to tailor our sample to the research question, so let that be your guide: if your participants need expert knowledge to perform the Q-sort, then of course it is impossible to make generalisations to a lay population. If the sort simply consists of tasting chocolate bars and indicating a preference, then you might prefer to select them on number alone. For convenience in this example we will settle for a sample of nine students.

Table 17.1 lays out the sort data as you would input them to the SPSS program. You will notice immediately that the layout does not suit SPSS, where the rows are numbered automatically – this is because it is used to

Table 17.1 Data for the Q-sort worked example

Bar	*Sort*								
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
A	2	2	1	2	1	0	1	–1	–2
B	1	0	1	1	2	1	–2	0	1
C	1	1	2	0	1	2	–1	0	–1
D	0	0	0	0	0	–2	2	–1	2
E	0	1	0	1	–1	–1	0	2	1
F	0	–1	–1	–1	0	0	–1	–2	0
G	–1	0	0	–2	–2	0	1	0	0
H	–1	–2	–2	0	–1	1	0	1	1
I	–2	–1	–1	–1	0	–1	0	1	–1

treating each row as a separate participant, or case, in the study. However, because in Q methodology the data matrix is 'inverted', the rows now become the items in the study (in this case, the nine different chocolate bars), while the columns represent the participants, or, more precisely, the sorts (it is perfectly legitimate for participants in this type of study to perform more than one Q-sort each[1]).

The next step is to perform a factor analysis, or pattern analysis, on the above data matrix. In relation to computer software, this is no different from performing a factor analysis on standard test data – mathematically the principle is the same, so long as you keep in mind the fact that the matrix is inverted and that the 'factors' equate to the sorts and not the items. This reversal in thinking can be quite tricky if you are an experienced factor analyst.

For this example, a principal components analysis was performed with Varimax rotation (in Q analysis the factors are always assumed to be orthogonal, or independent of each other – after all, they usually correspond to participants in the study). Four factors were extracted with eigenvalues > 1, which together explain 87 per cent of the total variance. The rotated component matrix is displayed in Table 17.2. This shows the loadings for the nine participants on each of the extracted factors (for simplicity, only loadings above 0.5 are included). The first five sorts all load highly on factor 1, although sort 5 is crossloaded on to factor 2 as well. However the loadings for sorts 6 and 7 are far higher on this factor, and sorts 8 and 9 load singly on to the remaining two factors.

How do we begin to interpret this analysis? First of all, it helps to know something about the bars themselves. The bars were selected for this imaginary study according to their flavour and then arranged in order of sweetness, with bar A having the highest sugar content and bar I the lowest. If you look at Table 17.1 you can see that the first four participants all tended to give positive ratings to the sweet bars and negative ratings to the less sweet bars – therefore factor 1 appears to have identified this 'sweet tooth' group among

Table 17.2 Rotated component matrix for Q-sort worked example data

Sorts	*Components*			
	1 ($\lambda = 3.3$)	*2 ($\lambda = 2.0$)*	*3 ($\lambda = 1.3$)*	*4 ($\lambda = 1.3$)*
1	0.88			
2	0.82			
3	0.76			
4	0.89			
5	0.65	0.51		
6		0.84		
7		−0.94		
8				0.99
9			−0.88	

our sample. The other factors are less easy to interpret without knowing the precise content of the bars, although it could be that other ingredient preferences determined our participants' sorts (nuts or raisins, or whatever).

This pattern analysis lends itself to two possible implications: the first, in line with Stephenson's philosophy, is that no two people are alike in the way they perceive or construct the world. Rather than imposing a pattern upon people in the way that a typical psychometric test might, we are better off asking our participants to organise our materials for us. Any correlations that emerge can then be attributed to shared worldviews or understandings. Therefore, the same chocolate bar can have strikingly different meanings for two different individuals, but there are trends within our sample which show some individuals to be alike in the meanings the bars hold for them.

The second implication, and the one which many postwar Q studies have tended towards, is that our sort has identified a pattern of response that can enable us to identify subgroups in the population as a whole. Of course, a Q-sort itself does not enable us to make such claims, but there are many other measures that we can introduce into our study in order to provide supporting evidence. For example, there is a theory that preference for sweet food is related to the stimulation of the nervous system (Cloninger 1994), and that it can be related to the personality trait of extraversion (also believed to originate from stimulation levels). Therefore, we might also like to have our participants complete the extraversion scale from the Eysenck Personality Questionnaire (Eysenck and Eysenck 1975) to see if our factor 1 participants score the highest on extraversion. This would in turn bolster support for this theory.

These two very different uses of Q-sorts are clearly opposed at an epistemological level, and for that reason we must be aware of the different 'dialects' of Q methodology that have emerged over the years (see Stainton Rogers 1995 for a discussion). Here I have characterised the dialects as respectively North American and European: this may be unfair in some cases, but I will try to emphasise the exceptions to this generalisation.

The European 'dialect' of Q methodology

The European (mostly British) dialect has emerged from the 'critical psychology' movement and emphasises the radical stance taken by Stephenson in developing Q methodology. This fits in with the general approach taken by critical psychologists towards mainstream psychology, particularly the rejection of 'essentialist' psychology, the idea that humans are reducible to a mixture of traits which are, to varying extents, determined by biology. (For a general discussion of 'critical' themes, see Chapter 11.)

In the worked example above, I showed how we could interpret the data either as evidence of the complexity of human experience, or as evidence for subgroups, in this case based on a preference for sweet foods. Many psychologists would be unsatisfied with the former interpretation (statistical

complexity is often referred to, sneeringly, as 'noise'). However, critical psychologists using Q methodology see this as its advantage over other statistical techniques, mainly because its complexity is attributed to the freedom of response which participants are given. Like qualitative research in general, they prefer to see the Q-sort as a celebration of 'mess' rather than a tidy-up technique. Probably the best way to explain this is to present an example from the literature.

Stenner and Stainton Rogers (1998): jealousy as a complex phenomenon

This paper is a good example of a contemporary study using a Q-sort in the European tradition. This study is concerned with people's understandings of the concept of *jealousy*. In the introduction the authors argue that mainstream psychology characterises jealousy as a negative emotion that is a *problem* and that psychology's role is to deal with it and somehow contain it. Whether or not this is a good thing for society (and why not, let's at least see if we can prevent jealousy from getting out of hand) is irrelevant if we fail to pin down exactly what constitutes jealousy. The authors argue that mainstream psychology's attempts to reduce jealousy to simple, uncomplicated individual or social processes (or even genetics) fail to capture the complexity of the emotion. Before we can attempt to 'do' anything about jealousy, we need to understand it fully.

The purpose of their study is, therefore, to demonstrate the variety of shared understandings people hold of jealousy – the authors refer to this as a 'manifold' of understandings. Participants were recruited for the study first through an advertisement placed in a local newspaper, and then by using a 'snowball' sample, where respondents to the advert were asked to distribute materials to family and friends. Eventually 47 completed Q-sorts were returned. The participants were drawn from a wide variety of occupations and ages (to give as great a variability of response as possible in such a small sample).

Participants were asked to generate a short scenario depicting an act of jealousy performed by a specific individual, henceforth referred to as 'person X' (the scenario could be either real or fictitious). The Q-sort itself consisted of 54 statements relating to jealousy, which the participants were asked to relate to the person X in their scenario – for example 'X is just being selfish' – which were sorted into a normal distribution provided by an appropriate grid. Participants were asked to sort the statements on the scale most disagree (–5) to agree (+5). The statements were initially selected from a pool of several hundred statements drawn from a 'concourse' of interview data, media coverage, and even role-play scenarios concerning jealousy.

The factor analysis of the sort data was performed in the same way as in our worked example. The loadings of the sorts on the factors enabled the

authors to cluster the participants into different groups based on the content of their scenarios: from this point on, the actual sorts are largely neglected (although they can be used to check the validity of the factor interpretations). These factors were not selected on the basis of eigenvalues or scree tests, but on their distinctiveness. This was assessed by asking an independent panel of 51 judges to read three scenarios per factor where two belonged to the same factor and one to another factor. If the judges were able to identify the odd one out (at an above-chance level of agreement), then that factor was retained for interpretation. In total, the authors regarded 10 factors as sufficiently distinctive for interpretation. Here are the characteristics of the first four:

- *Factor 1* appeared to group together participants whose scenarios involved men acting in aggressive or violent ways. In each case, the 'person X' is regarded as overly possessive towards a female, and this is indicative of chauvinistic attitudes towards women.
- *Factor 2* grouped together participants whose scenarios involved female actors who were justly piqued at being betrayed, for example, finding out about a husband's infidelity. The authors go on to link factors 1 and 2 as 'anti-naturalist' approaches to jealousy: in each case, the participants treat jealousy as something which is attributable to political or moral situations (power, for instance) rather than individual or essential qualities of human beings.
- *Factor 3* grouped together participants whose scenarios were more ambiguous, and seemed to be indicative of the state of an unequal relationship rather than individual responses, or responses to a particular situation. For example, person X is jealous because s/he perceives her or his partner as more desirable and responds by acting defensively and insecurely. The authors regard this factor (in conjunction with a lesser factor) as an example of 'naturalistic' jealousy – in other words, it is a natural and understandable response to a situation.
- *Factor 4* is concerned with overreaction: here the scenarios describe individuals who, because of personality factors, blow trivial situations out of all proportion. This is grouped together with a lesser factor by the authors as examples of 'essentialist' jealousy – that which is attributable to the make-up of the individual rather than social or natural factors.

The authors regard this 'manifold' of jealousy as evidence for the complex nature of the phenomenon. They found that the Q-sort patterns provided by participants were indicative of the nature of their scenarios and that the interpretation of the factors was therefore robust. They argue that the different themes in the scenarios and sorts demonstrate a variety of different accounts, or discourses, of jealousy that can be found in modern culture. Therefore, treating jealousy simply as an individual, consistent and predictable

response to a consistent and predictable set of stimuli is a misguided approach to dealing with the emotion.

The North American 'dialect' of Q methodology

I shall begin this section by apologising to North American researchers such as Steven Brown, a former student of Stephenson, who is as devoted to the original aims and philosophy of Q methodology as any of the British 'critical' psychologists using Q-sorts. He is not alone; after all, Stephenson emigrated to the United States after the war, partly because of his isolation at the hands of the R methodologists, and still has a large following in that country.

However, the popularity of Q-sorts in modern psychology largely derives from other, later uses of the technique, most of which largely dispensed with the underlying philosophy and used Q-sorts simply as an extension of R methodology. Most of the research published in psychological journals in North America today tends to hark back to the development of the California Q-set (Block 1978), a sorting instrument which was devised largely for the purpose of identifying clinical subtypes. In fact it is not the persons themselves who sort the materials in this procedure, but the clinicians (or the 'informants'), who sort 100 descriptions (e.g., 'is verbally fluent: can express ideas well') on an agree/disagree scale as they are applied to the client in question. As you can imagine, the methodology underlying this technique is vastly different to the 'empowering' one envisaged by Stephenson and promoted by critical psychologists in Europe.

Creed and Funder (1998): concordance of perspectives on behaviour

This example from the literature involves a study to examine the reliability of clinicians' sorts on the Californian Q-set by correlating informants' sorts with those carried out by the participants themselves using the same materials. In this study the participants were 149 undergraduates, and the informants were family members or friends who the participants chose to take part in the study. These two sets of data were also correlated with an original set of items which were sorted by the researchers on the basis of observing participants' behaviour in social interactions (the behavioural Q-set). The participants also completed Fenigstein *et al.*'s (1975) self-consciousness scale.

First, the authors found that there was a high correlation between many of the self-reported items on both the scale and the Q-set. The authors were particularly concerned with the issue of social anxiety; they found that items such as 'is uncomfortable with uncertainty and complexities' were rated highly on both instruments, while 'is a talkative individual' received high negative ratings.

The next analysis was to compare the correlations between scale scores and Q-sets for men and women. This was done by computing a *vector correlation*, where the male data and the female data are correlated in their entirety (i.e., the correlations are correlated). There was found to be a high

degree of similarity in male and female Q-sorts, at least on the social anxiety items. The next step was to compute a vector correlation of the informants' Q-sorts along with the participants' Q-sorts. Here again there was high agreement between informants and participants.

Finally, the authors examined the behavioural Q-sort to see if the observers' sorts of the statements were successful in distinguishing socially anxious individuals. Here, almost half the statements were successful in discriminating between socially anxious and socially comfortable individuals. In the interactions observed, the participants' partners were also rated, and it was found that the behaviour of the participants was strongly contrasted; for example, socially anxious individuals tended to allow the other person to dominate the interaction, and were generally rated as less likeable and less enjoyable to interact with.

Once again, we have an example of a use of Q-sorts which is vastly different from that of the British work, in which the Q data simply serve as another measure to be correlated with other measures instead of acting as an end in themselves. Of course there is nothing intrinsically 'wrong' with such use of the technique, except that it does not employ the factor analytic approach which was so useful in identifying types in the Stenner and Stainton Rogers (1998) study. Perhaps more widespread use of, and knowledge of, Q methodology would enhance the status of the Q-sort as a technique in its own right, and not just another measure in a correlational study.

Summary

Q methodology is an approach to collecting and analysing data that was developed in the 1930s by William Stephenson as an alternative to factor analysis (or 'R methodology'). It has since been appropriated by two diverse groups of researchers, crudely characterised as the North American and European dialects of Q methodology. In the North American dialect, the Q-sort, the principal method, is used as a correlational technique for items which are sorted in a particular pattern along a scale by participants. In Europe (and by some psychologists elsewhere, including the US), the use of Q-sorts sticks closer to Stephenson's original aims of a factor analysis which identifies groups of people rather than groups of objects (e.g., scale items). It has to be said that my example using chocolate bars doesn't really translate into either dialect, but I hope it gets the statistical principles across.

Note

1 For an example of this type of study, see Stenner and Stainton Rogers (in press). This paper reports a Q study in which each participant sorted the same set of items four times. Each sort was done in relation to a different emotion (love, jealousy, joy and embarrassment), the object being to show how emotion words or concepts take on different meanings when applied to different emotions.