Q-sort Methodology: The Systematic Study of Participant Viewpoints in Social Research

Rosa Rodrigues[1,2,3], Paula Lopes[4,1] and Miguel Varela[1,2]
[1]Instituto Superior de Gestão – Business & Economics School, Lisboa, Portugal
[2]CEFAGE – Center for Advanced Studies in Management and Economics, Évora, Portugal
[3]The Transdisciplinary Research Center of Innovation & Entrepreneurship Ecosystems (TRIE), Lisboa, Portugal
[4]Lusofona University / CICANT - Centre for Research in Applied Communication, Culture, and New Technologies, Portugal
paulalopes@isg.pt
rosa.rodrigues@isg.pt
miguel.varela@isg.pt

Abstract: In social sciences research there are instruments made up of questions and that aim to ascertain opinions, behaviors and attitudes, aim to find out how the person would act in a given situation, instead of putting the person to the test. Although there are no right or wrong answers, there is a tendency to respond in a socially acceptable way, even if the answer does not correspond to reality. This problem can be circumvented through the Q-sort methodology that combines quantitative and qualitative data and analytical techniques that are not present in other methods. In this way, it consists of presenting participants with a set of statements on a given topic and asking them to classify them according to their opinion, according to a predefined distribution, which, in general, is approximately normal. This methodology forces participants to distribute the score among the items on the scale, thus avoiding the constraints associated with social desirability and the tendency to respond in the same way or always through the midpoint to different questions. Another advantage is that it provides linearity and near-normality to the scale, which makes it possible to compare subjects more easily with each other. Notwithstanding its advantages, Q-sort methodology also has negative points because forced-choice measures produce ipsative data that lead to distorted scales and problematic psychometric properties. As the data are obtained by ordering a set of items or by forcefully choosing one item over another, it is impossible to reach very high or very low values on all scales, which gives rise to a large number of negative values that, in turn, they result in an average correlation between the scales, which is also negative. In view of the above, it was considered pertinent to review the research carried out on the q-sort methodology, presenting its main advantages and disadvantages.

Keywords: Q-sort methodology, Data analysis methodology, Data collection procedures, Human perspectives, Social research

1. Introduction

The Q methodology was presented by Stephenson (1935) and later refined in Brown (1996) for the areas of social sciences and humanities to study subjectivity through a combination of qualitative and quantitative techniques (Zabala et al., 2018). It is a methodology that aims to investigate subjective perspectives, beliefs and concepts that characterize human mental states and behavioral manifestations (Akhtar-Danesh, 2018).

According to Lundberg (2019) it is appropriate to study social phenomena around which there is much debate, conflict and contestation, since the study of values and attitudes is often carried out with self-report instruments. Therefore, most of the time, the answers are given according to social norms and the representations that people build of reality and not according to reality itself (Escobar Cabello and Sánchez Soto, 2019). To avoid this situation, subjects are required to classify the scale items according to a previously established distribution, which approximates normality (Stenner and Capdevila, 2020).

Following this idea, Kamperman et al. (2022) add that it is desirable that the data follow a normal distribution, as it means that the values of the variable are grouped around the mean, in a symmetrical pattern, which reveals that the responses of the participants are diversified, a fundamental aspect for the making statistical inferences.

The purpose of this article is to review the research carried out on the q-sort methodology, presenting its main advantages and disadvantages.

2. Literature review

2.1 Q-sort Methodology

Q-sort is a mixed research method that uses quantitative results to confirm qualitative results in order to better understand the phenomenon under study (Santos et al., 2019). One of the strengths of this methodology is its exploratory approach and its potential to generate theories, since, generally, no hypothesis is formulated before the execution of the study (Lundberg, 2019). In addition, several authors (*e.g*., Eyvindson et al., 2015; Moree, 2017; Thompson et al., 2013) describe the Q-sort methodology as a reliable approach to fill the gaps inherent in the R method that only allows relate differences between individuals, while Q-sort makes it possible to relate intra-individual differences.

Following this idea, Eyvindson et al. (2015) adds that the R Method emphasizes the analysis of the relationships between the variables, while the Q Method focuses on comparing the perception of each of the individuals within the sample in which they belong. This method consists of a group of statements or objects about a topic predetermined by the researcher (*e.g*., The sustainability practices adopted by the organization comply with current legislation) and from which participants classify these statements into categories (Santos et al. al., 2019).

The Q-sort table includes a rating scale that can range from -3 and +3 to –6 to +6, depending on the degree to which participants agree with each of the statements presented. There is no ideal range, because it depends on the number of statements. A greater number of statements generally requires a wider reach (Akhtar-Danesh et al., 2018).

When organizing the statements according to their personal opinions, each one occupies a place in the table according to the importance attributed to each one, which varies from negative to positive (Figure 1). After completing each individual Q-sort, the statements receive the rating assigned to their place in the table and in the general Q-sort, made up of the responses of all participants. The values assigned to each statement are added together and generate the final score assigned to each category (Lutfallah & Buchanan, 2019).

The number of columns and rows that make up the table depends on the number of statements developed/selected by the researcher, each of which must have a place in the table so that it can be sorted by the participant. If the number of statements to be evaluated is 25, the table must consist of 25 spaces (Santos et al., 2019).

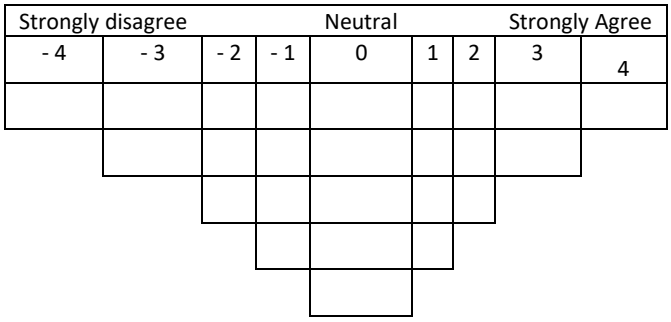

Figure 1: Q-sort table with extremes that oscillate between – 4 and 4

(Adapted from Santos et al. 2019)

The table presented in Figure 1 is composed of nine columns, where the value minus four (-4) corresponds to total disagreement with the statement and four represents total agreement with it. The number of responses corresponding to each statement was limited in advance, which forces a forced distribution and encourages participants to carefully reflect on the ranking of statements according to their point of view on the topic (Lucinski, 2016). The Q-sort matrix facilitates the analysis and interpretation of results and increases the accuracy of the analysis performed (Martínez et al., 2021).

The Q-sort methodology makes it possible to establish correlations between people and not between measurement instruments, so that participants who order items in a similar way share the same point of view on the subject under analysis. Based on individual correlations, factors are extracted that identify people who

reveal similar or different opinions regarding a given factor (Escobar Cabello and Sánchez Soto, 2019). The linearity and approximation of the normality of the data distribution, allows the subjects to be compared with each other more easily (Stenner and Capdevila, 2020).

It is important to mention that like any methodology, this one also has advantages and disadvantages that we will now describe.

2.2 Advantages of the Q-sort methodology

One of the main advantages of this methodology is related to the decrease in the number of answers attributed to the midpoint of the scale, because when participants answer different types of questions in the same way, validity is compromised due to the bias of the results (Karim, 2001).

According to Stenner and Capdevila (2020), the person always marks the same answer because he is afraid to take a position on the subject under analysis and decides to respond according to his perception that it is socially desirable. With Q-sort, participants are forced to distribute their answers across the various spaces of the table, which implies decision making and as such the effort to distort the answers is considerably less (Ramlo, 2021).

Unlike questionnaires, whose items can be answered using a Likert-type scale, which requires a single reading for a generally direct and quick answer, Q-sort may require several decisions to assign an answer, because it requires a comparison of each affirmation with the others, which increases the validity of the evaluation process (Eyvindson et al., 2015).

Another advantage concerns the a priori criterion used by the researcher to develop the measurement instrument, since, as he is responsible for choosing theories and/or variables, he selects the response scales that may allow him to validate his hypotheses (Lundberg , 2019).

In the Q-sort, the answers are classified, by the participants, according to their references on the topic under analysis, that is, it is the respondent who decides the importance he attaches to each statement in relation to the others and its ordering in the table. Subsequently, this ranking is compared with that of the other participants to assess the similarities and differences in relation to their points of view. Thus, it is not the researcher who prepares the Q-Sort who decides, a priori, the classifications, but the respondent, from his point of view (Stenner and Capdevila, 2020).

2.3 Disadvantages of the Q-sort methodology

Despite its advantages, the Q-sort methodology also has negative points, because forced-choice measures produce ipsative data that lead to distorted scales and problematic psychometric properties (Salgado et al., 2015).

In this context, Martinez et al. (2021) report that as the results are relative, it is impossible to obtain very high or very low values on all scales, which leads to a large number of negative values which, in turn, result in an average correlation between the scales, which is also negative. And despite these averages approaching zero, when there are few scales involved, it becomes difficult to assess the construct validity through the Classical Test Theory (Kleka and Soroko, 2018), which leads Walton et al. (2020) stating that with less than 30 scales it is practically impossible to obtain psychometric parameters that can be interpreted.

Martínez et al. (2021) also states that often a normal distribution may not be appropriate for ipsative data, because as all scales are correlated, it is more likely that profiles with predominantly positive or negative values will emerge, which have asymmetry coefficients and kurtosis that deviate from the range -1.96 to 1.96 recommended in the literature.

The interdependence that exists in the forced choice scales and in the observed results can change the psychometric properties of the instrument, because the selected item does not depend only on the level of latency that it is measuring, but also on the set of items to which it belongs, which makes that each observed result is influenced by the results of the set of items (Welter and Capitão, 2007).

Santos et al. (2019), in turn, report that, due to the low intercorrelation of the items, the subscales tend to have low internal consistency, with average values around 0.20, which is why it is not uncommon for it to be rejected to the detriment of the Likert scales.

3. Q-sort methodology Phases

The effectiveness of the Q-sort methodology depends on the fulfillment of the steps recommended by Ferreira et al. (2022), namely: (i) identification of the topic to be analyzed; (ii) gathering information from a literature review or through interviews with experts in the study area; (iii) selection/development of a representative set of statements; (iv) election of participants who meet all the inclusion criteria; (v) construction and application of the Q-sort with the statements considered most relevant to answer the research problem; (vi) statistically analyze individual and global results through factor analysis of Q-sorts, with the aim of revealing which individuals are part of each point of view and the "strength" of this connection; (vii) and qualitative interpretation of ratings to explore claims that differentiate one factor from others.

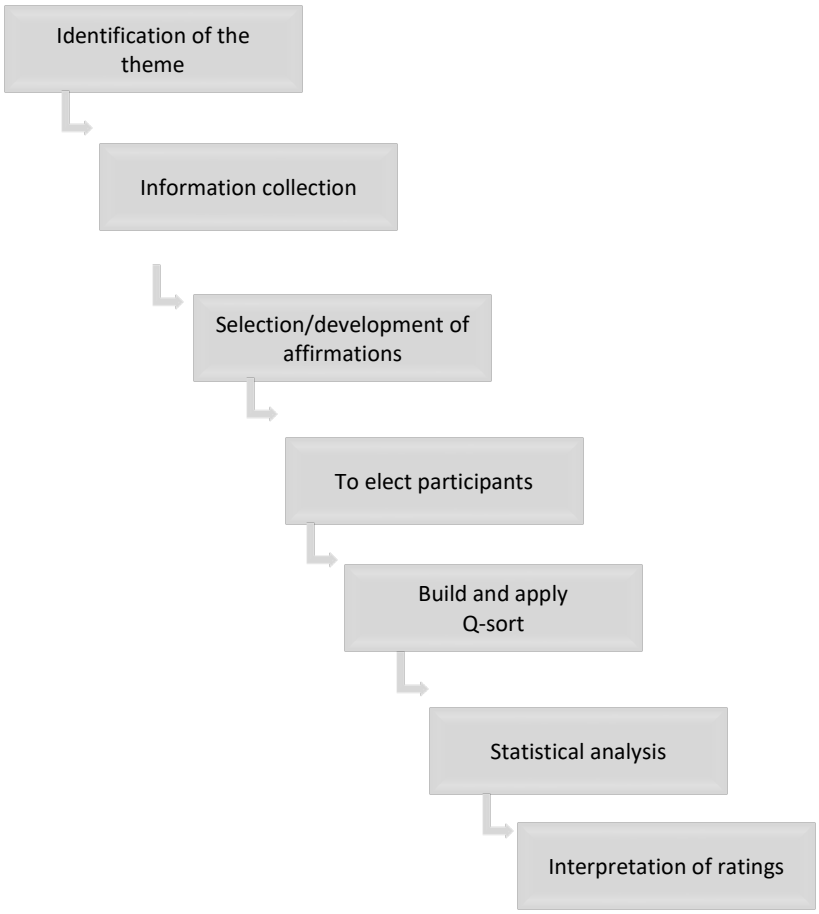

Figure 2: Q-sort methodology Phases

(Adapted from Ferreira et al., 2022)

It should be noted that the Q-sort methodology does not require large samples, because after a certain number of statements, theoretical saturation is reached and no new information is introduced (Maia et al., 2018). In addition, statistical validity is not the main concern of this type of methodology, since the importance falls on the different opinions (subjectivity) about the topic being studied and not on the percentage of the population that adheres to each of these opinions (Ferreira et al., 2022).

This methodology allows analyzing whether there is agreement between the opinions of the participants, how and why it occurs. The comparison of convergent, complementary and/or contradictory opinions can be extremely useful in all areas of knowledge, in particular those dedicated to the study of subjective social phenomena that largely depend on the values and beliefs of those who evaluate them (Escobar Cabello &

Sánchez Soto, 2019). The use of the Q-sort methodology makes it possible to expose similar profiles of individuals who share ideas (Stenner and Capdevila, 2020) regardless of sociodemographic variables (*e.g*., sex, age, education level).

4. Conclusion

The Q-sort methodology is suitable for social phenomena where there is a lot of debate, conflict and contestation (*e.g*., sustainability, politics and religion), so the objective is not to obtain the absolute truth, but rather to collect and explore as many opinions as possible /points of view of different people (Wulff, 2019).

According to Santos et al. (2019) the distribution used in the Q-sort methodology has several advantages over traditional Likert-type scales, among which the impossibility of the respondent to agree with all the questions or choose only the central answers stands out. All answers have to be allocated to the space of the table corresponding to the degree of agreement attributed to each statement (Ramlo, 2021).

The elaboration of a Q-sort instrument implies the presentation of a set of statements to the participants who must distribute them according to the degree of agreement with them (Rampold et al., 2020). The classification is based on the respondents' references on the subject under study and according to a previously established nomenclature (Stenner and Capdevila, 2020).

This methodology was created to give participants the opportunity to express their opinions on a given topic, without the researcher being responsible for choosing the variables that allow the validation of their research hypotheses (Ferreira et al., 2022).

References

Akhtar-Danesh, N. (2018) "Qfactor: A command for Q-methodology analysis", *The Stata Journal,* Vol. 18. No. 2, pp. 432-446. https://doi.org/10.1177/1536867X1801800209

Boom, S., Weijschede, J., Melissen, F., Koens, K. and Mayer, I. (2021) "Identifying stakeholder perspectives and worldviews on sustainable urban tourism development using a Q-sort methodology", *Current Issues in Tourism*, Vol. 24, No. 4, pp. 520-535. https://doi.org/10.1080/13683500.2020.1722076

Brown, S. (1996) "Q methodology and qualitative research", *Qualitative health research*, Vol. 6, No. 4, pp. 561-567. https://doi.org/10.1177/104973239600600408

Escobar-Cabello, M. and Sánchez-Soto, I. (2019) "Implementación del Q-SORT en la evaluación diagnóstica y formativa de logros competenciales en estudiantes de Kinesiología" [Implementation of the Q-SORT in the diagnostic and formative evaluation of competencies achievement in Kinesiology students], *Revista de investigación,* Vol. 43, No. 97, pp. 191-209.

Eyvindson, K., Kangas, A., Hujala, T. and Leskinen, P. (2015) "Likert versus Q-approaches in survey methodologies: discrepancies in results with same respondents", *Quality & Quantity*, Vol. 49, No. 2, pp. 509-522. https://doi.org/10.1007/s11135-014-0006-y

Ferreira, D., Oliveira, A., Ferreira, O. and Gomes, M. (2022) "Espiritualidade nexo qualidade de vida no trabalho: Um estudo subjetivo utilizando a metodologia Q" [Spirituality nexus quality of life at work: A subjective study using the Q methodology], *Research, Society and Development*, Vol. 11, No. 2, pp. 1-13. http://dx.doi.org/10.33448/rsd-v11i2.25648

Kamperman, A., Kooiman, C., Lorenzini, N., Aleknaviciute, J., Allen, J. and Fonagy, P. (2020) "Using the attachment network Q-sort for profiling one's attachment style with different attachment-figures", *PloS one,* Vol. 15, No. 9, pp. 1-22. https://doi.org/10.1371/journal.pone.0237576Karim, K. (2001) "Q-methodology: Advantages and disadvantages of this research method", *Journal of Community Nursing,* Vol. 15, pp. 8-10.

Karim, K. (2001) "Q-methodology: Advantages and disadvantages of this research method", *Journal of Community Nursing,* Vol. 15, pp. 8-10.

Kleka, P. and Soroko, E. (2018, August) "How to Abbreviate Questionnaires and Avoid the Sins?", *Survey Research Methods*, Vol. 12, No. 2, pp. 147-160. https://doi.org/10.18148/srm/2018.v12i2.7224

Lucinski, M. (2016) "*Competências de gestores de projetos voltadas para uma liderança sustentável: um estudo subjetivo utilizando a metodologia Q"* [Competencies of project managers aimed at sustainable leadership: a subjective study using the Q methodology]. Escola Politécnica da Universidade de São Paulo

Lundberg, A. (2019) "Teachers' beliefs about multilingualism: findings from Q method research", *Current Issues in Language Planning*, Vol. 20, No. 3, pp. 266-283. https://doi.org/10.1080/14664208.2018.1495373

Lutfallah, S. and Buchanan, L. (2019) "Quantifying subjective data using online Q-methodology software", *The Mental Lexicon*, Vol. 14, No. 3, pp. 415-423. https://doi.org/10.1075/ml.20002.lut

Maia, L., Espindola, D. and Veiga, C. (2018) "Operations social practices in safety and health at work: scale validation and reliability through the Q-sort method", *Revista de Gestão*, Vol. 25, No. 1, pp. 119-139. https://doi.org/10.1108/REGE-11-2017-004

Martínez, A., Moscoso, S. and Lado, M. (2021) "Faking Effects on the Factor Structure of a Quasi-Ipsative Forced-Choice Personality Inventory", *Journal of Work and Organizational Psychology*, Vol. 37. No. 1, pp. 1-10. https://doi.org/jwop2021a7

Moree, W. (2017) "Q-Methodology Explained by Comparing Q-Sort Survey with Conventional R Sample Survey and Relating Factor Analysis Described", *Civil Engineering Research Journal,* Vol. 1, No. 2, pp. 1-5. https://doi.org/ 10.19080/CERJ.2017.01.555560

Ramlo, S. (2021) "Q methodology as mixed Analysis". In *The Routledge reviewer's guide for mixed methods research analysis*" (pp. 199-208). Routledge, London.

Salgado, J., Anderson, N. and Tauriz, G. (2015) "The validity of ipsative and quasi-ipsative forced-choice personality inventories for different occupational groups: A comprehensive meta-analysis", *Journal of Occupational and Organizational Psychology*, Vol. 88, No. 4, pp. 797-934. https://doi.org/10.1111/joop.12098

Santos, A., Petrini, M., Lupion, R. and Hepper, E. (2019) "With your actions I discover who you are: Profiles of Sustainable Organizations", *Revista de Administração e Contabilidade da Unisinos,* Vol. 16, No. 3, pp. 464-487. https://doi.org/10.4013/base.2019.163.05

Stenner, P. and Capdevila, R. (2020) *Q methodology*. Sage, Newcastle.

Stephenson, W. (1935) "Correlating persons instead of tests", *Journal of Personality*, Vol. 4, No. 1, pp. 17-24. https://doi.org/10.1111/j.1467-6494.1935.tb02022.x

Thompson, A., Dumyahn, S., Prokopy, L., Amberg, S., Baumgart-Getz, A., Jackson-Tyree, J., Perry-Hill, R., Reimer, A., Robinson, K. and Mase, A. (2013) "Comparing random sample Q and R methods for understanding natural resource attitudes", *Field Methods*, Vol. 25, No. 1, pp. 25-46. https://doi.org/10.1177/1525822X12453516

Walton, K., Cherkasova, L., and Roberts, R. (2020) "On the validity of forced choice scores derived from the Thurstonian item response theory model", *Assessment*, Vol. 27, No. 4, pp. 706-718. https://doi.org/10.1177/1073191119843585

Wulff, D. (2019) "Prototypes of Faith: Findings with the Faith Q-Sort", *Journal for the Scientific Study of Religion*, Vol. 58, No. 3, pp. 643-665. https://doi.org/10.1111/jssr.12615

Zabala, A., Sandbrook, C. and Mukherjee, N. (2018) "When and how to use Q methodology to understand perspectives in conservation research", *Conservation Biology*, Vol. 32, No. 5, pp. 1185-1194. https://doi.org/10.1111/cobi.13123