Operant Subjectivity

The International Journal of Q Methodology

Exploring the Relation Between Q Methodology and Phenomenology: Designing Conditions of Instruction Based on the Phenomenological Concepts of Variation and Horizons

Stéphanie Gauttier
Grenoble Ecole de Management

Nicola Liberati
Shanghai Jiao Tong University

Abstract: This article investigates the relation between Q methodology and phenomenology. The common characteristics of Q and phenomenology have been discussed by Q methodologists, but these discussions have remained at an abstract level. They look at how Q is close to the aims of phenomenology, but they provide little guidance on how to apply Q in a more phenomenological manner. As a result, phenomenology can easily become a mere label rather than a mode of enquiry. This can lead to overlooking important aspects when elaborating research designs for Q studies. It also leads phenomenologists to discard Q as a tool to achieve their goals. The contribution of this article lies not only in linking the purpose of Q to phenomenology but also in the identification of elements that can be manipulated by the researcher when designing a Q study in order to collect and analyze Q data in a phenomenological way. We suggest that the tools used by phenomenologists, specifically variations, can be applied in Q to improve the quality of the data collected. A framework is proposed to identify variations based on the different horizons described in phenomenology, supported by an illustrative single-case study.

Keywords: horizon, phenomenology, Q methodology, research design, single-case study, variation

Introduction

This article aims at investigating the phenomenological character of Q methodology (hereafter Q) and the conditions in which Q comes close to giving a phenomenological account of participants' subjectivity and points of view. This is not to say that Q belongs to phenomenology, but rather to explore how Q can be used for the purpose of phenomenological studies, in respect of the principles of empirical phenomenology. Indeed, Q methodology has been discussed in relation to phenomenology (Stephenson, 1988; Shinebourne & Adams, 2007) and phenomenological psychology (Smith, 2001). However, the direct application of Q as a phenomenological method is rare (Taylor et al., 1994 provides an example) and the relation between phenomenology and how

researchers apply Q has not been discussed in detail.

It can be difficult for empirical qualitative researchers to differentiate between the various streams in phenomenology and to find ways of putting them into practice. As a result, phenomenology can easily become a mere label rather than a mode of enquiry. In addition, the phenomenological aspects of Q are rarely considered in current developments of the method. Investigating how Q can be applied to do empirical phenomenology and highlighting the implication of such a positioning for the design of Q studies can benefit empirical phenomenologists: Q can become an alternative or a complement to other methods affiliated to empirical phenomenology, such as phenomenological interviews. It can also benefit the community of Q methodologists. Indeed, thinking of applying Q in a phenomenological manner can inspire new uses of the methodology to increase the relevance of the data collected and the resulting factors.

The contribution of this article lies not only in linking the purpose of Q to phenomenology but also in the identification of elements that can be manipulated by the researcher. Such choice applies when designing a Q study, when collecting and also analyzing Q data, in order to use Q in a phenomenological way. We suggest that the tools used by phenomenologists, specifically the notion of variations, can also be applied in Q, and that they can be designed based on the concept of horizons present in phenomenology.

First, we provide a brief introduction to Husserl's phenomenology as it informs this article. Second, a generic presentation of Q methodology is given. Third, we review the literature discussing the congruence between the goals of Q and Husserl's phenomenology. We then discuss the implications of these overlaps for the design of empirical studies. Fourth, we investigate how Q can use phenomenological tools, namely the variations and horizons, to achieve a better grasp of experiences. Fifth, we present a single-case study using these tools. Finally, we discuss the opportunities for future research arising from our analysis, and the limitations of this article.

Brief Introduction to Phenomenology

This introduction provides the reader with a common basis and lexicon to follow our analysis linking phenomenology and Q. We focus on Husserl as the founder of phenomenology – also discussed by Stephenson (1988). We focus mostly on elements developed in the "first Husserl," elements developed in his early phenomenological texts, such as *Logical investigations* and *Ideas I*, which were founded on a static analysis,[1] as well as descriptions of these elements in later texts.

Phenomenology aims to study experience as lived by human subjects, without introducing theories which might affect this direct way of experiencing. Subjects perceive the world around them, and phenomenology strives to highlight this direct relation linking them.

Phenomenology's famous motto is "back to the 'things themselves'"[2] (Husserl, 1984).

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[1] This period has to be opposed to later periods where the Husserl started different studies like the "genetic analysis" and the "generative phenomenology".

[2] The phenomenological motto "back to the things themselves" should not be related to the existence of the things-in-themselves [Ding an sich] present in Kant's philosophy. Kant refers to the thing-in-itself showing how subjects cannot "reach" such entities because subjects are always forced to perceive the objects according to their limited perceptual capabilities and point

This motto is a clear invitation to look at the things in the world – because they already provide many elements which are objective and simply need to be highlighted. According to phenomenology, the experience is self-evident in the sense that it provides a ready truth, which cannot be confuted (Öktem, 2009; Husserl, 1975). Perhaps the experience can be corrected in time because the subjects can better perceive the object or even discover those objects that are perceived to have changed (Husserl, 1973a). However, this change merely highlights the possibility of correcting our experience. For example, a person might perceive a cup of espresso on the table, but once closer to it the person might realise it is not a cup of espresso, but it is a cup with macchiato in it. This possibility does not deny the value related to the initial perception; if it did, that would undermine the truth embedded in the experience (Husserl, 1980, 487). The objects in the world are given to the subject directly.

This intentional relation linking subjects to objects shows how, for phenomenology, the truth related to the experience of one person is already present in that experience as self-evident; it does not need further verification (Berghofer, 2018). Thus, the flow of experiences is related to subjects' viewpoints. At the same time, it also has objective validity. Practicing phenomenology means reaching this objectivity within the subjectivity of the experience.

Husserl developed many different terms and a specific lexicon for his new philosophy. He used the term "eidos" (from the Greek εἶδος) to point to the essence of the experience, identifying its invariant parts (Husserl 1950, § 2; Husserl 1984, § 66). The eidos of an object is not something abstract, absent from the experience. It forms part of the object, and the subject directly perceives it through eidetic intuition (Husserl 1950, § 3). When a person perceives a cup of coffee, they do not perceive merely its contingent elements related to that specific experience, but its essence. Sometimes the eidos might be hidden and not manifest. But even when latent, it is present as an integral part of the experience. Phenomenology aims to reveal this eidos.

Practical Presentation of Q Methodology

In order to understand how thinking of Q in terms of phenomenology can influence how Q methodologists can design their studies, a generic description of Q and the stages of a Q study are required.

Q methodology was developed by psychologist and physicist Stephenson (1935, 1953) as an approach to capture people's operant subjective views of phenomena. Subjectivity is conceptualized as what "emanates from a particular vantage point" (Brown, 1993). Factors are said to be operant as they drive individuals' behaviors. In Stephenson's understanding, feelings and overt behavior occupy the same space so that all we have is behavior. The factors are not predictive, but intentional (Stephenson, 1991). Q is thus a method suited to the identification of the structuring elements of

of view. Thus, even if they cause the appearances of objects, they cannot be perceived by subjects as they are. In contrast, according to phenomenology, subjects directly perceive the world as it is. The fact that subjects are "limited" to their perceptual capabilities shapes the way they are in relation to the objects, but it does not preclude the accessibility for subjects of the things in the world. For this reason, the phenomenological motto refers to different "things" than the ones in Kant's philosophy since they are directly experienceable by subjects. A clear reference can be found in the following volume of the *Husserliana*, where Husserl directly relates to Kant's ideas showing how distant their approaches are [HuaVII, p. 363]

behaviors, which can also be experiences.

Q methodology rests on two pillars. One is theoretical and refers to concourse theory. The other is methodological and implies Q-sorting procedures and Q-factor analysis (Gauzente, 2010). Concourse theory posits that meaning depends on context and therefore cannot be given *in abstracto*. A concourse can be defined as the volume of available statements on a topic; it is "the common coinage of societies large and small and is designed to cover everything from community gossip and public opinion to the esoteric discussions of scientists and philosophers" (Gauzente, 2010). Meanings exist for each individual and they vary depending on circumstances. However, meanings can be shared with others, making interpersonal communication and interpretation possible. Concourses can be identified in three different ways:

1)   Naturalistic – that is, gathered for the purpose of the study through interaction with participants during focus groups or interviews (Brown, 1980).
2)   Ready-made – that is, already constituted in the literature, or obtained through a literature review or constituted by a series of experts.
3)   Hybrid – that is, the researcher supplements a naturalistic concourse with elements found in the literature.

The items included in the concourse can then be expressed in the form of pictures, textual statements and sounds. Researchers can also consider using odour.

The first step in a Q study involves generating the items included in the concourse. The concourse constitutes "the flow of communicability around a topic" (Brown, 1993, p. 94) and can thus be rather large. For practical purposes, researchers have to derive a sample of statements from the concourse. There is no standard number of statements to include in the final Q sample, the set of items that will be presented to participants. However, including more items decreases the chance of finding random correlations. At the same time, one should consider the format of the assertions and the capacities of participants: children, patients with serious conditions and elderly people might not be able to rank as many assertions as people from other groups. In essence, the researcher is responsible for ensuring that participants can express their points of view holistically, through the assertions proposed, while maximizing the quality of the data collection.

These items are then ranked in terms of a Q sort grid. The respondent rank-orders the assertions according to how much each represents their subjective view of the topic. The forced-choice ranking distribution means that only a few assertions can be selected as highly positively – or negatively – representative. Most of the items will be neutral. This process forces respondents to choose and structure their point of view.

The result of the Q sorting process by the participants is called a Q sort. Participants are typically invited to comment on their Q sort and to explain how they interpreted the elements of the concourse, as well as their own subjective viewpoint as revealed through the process of the study.

Factor analysis is then used to process the Q sorts. The Q sorts are first correlated with one another. The researcher then extracts Q factors which are designated as shared views among the participants. While the views extracted are representative of the participants, they cannot be said to be representative of an entire type of population. In that sense, the views identified are not a statistical representation of groups in the general population (McKeown & Thomas, 2013) in that Q does not pretend to make quantitative generalizations of its findings nor claims about the verifiability of its

results. The factors are considered true because they are generated to represent the points of view of individuals who participated in the study. They are accepted as such, as is the experience in phenomenology.

The Relation Between Q and Phenomenology

Q does not originate from Husserl's phenomenology but from the factor theory of Spearman (Stephenson, 1988). However, in some of his theoretical essays Stephenson explored the relationship between Q methodology and phenomenology. He reconciled Spearman and Husserl's work because both scholars are concerned with aspects of cognition. Stephenson (1988) discussed Husserl's phenomenology as being congruent with Q methodology. He also investigated the links between other accounts of phenomenology, like those of Heidegger and Poole, and Q (Stephenson, 1985, 1988), and compared the writings of Joyce to phenomenology and Q (Stephenson, 1991). Following Stephenson's articles, Taylor et al. (1994) and Shinebourne and Adams (2007) further investigated the links between Q and phenomenology.

Similarities between Q and phenomenology

First, Q and phenomenology have similar goals, even if they do not always use the same terminology to designate their constitutive elements and objectives. Taylor et al. (1994) described Q and phenomenology as having a similar aim, namely, to study human experience. Indeed, Q is a tool that allows researchers to investigate subjectivity by applying quantum theory through factor analytic theory (Stephenson, 1988). In that sense, Q addresses Husserl's call (1970) to investigate subjectivity in an objective manner.

Q, like phenomenology, is conceived as a method that allow research into human experience from the point of view of the person who is studied.[3] For this endeavor, new research methods were needed (Brown, 1980; Kuiken, Schopflocher, Wild, 1989). By developing Q methodology, Stephenson addressed the need for tools to study subjectivity (Taylor et al., 1994).

Both Husserl's phenomenology and Q methodology arrive at perspectives or factors stemming from facts that were naively taken for granted (Stephenson, 1988). Q methodology could help to better examine experience and to reveal some aspects of it which were hidden (Taylor et al., 1994) – that is, the experience felt "inside" by the participants (Stephenson, 1988). The individual holds the experience within, and his or her infinite interest in finding out more aspects of their experience enables the revelation of it. This interest puts the person in a better position to discover the truth about the experience, whereas the researcher is interested in the logic at play.

In Q as in phenomenology, the role of the researcher is to allow the participant to find out this truth by using the naïve self-evidence the participant produces; that is, the facts derived from the participant's experience. The researcher introduces a methodology to facilitate that process. By doing so, the researcher encourages reduction from the participants' side, so that psychological consciousness (empirical facts of experience or

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[3] This position is in line with phenomenology. Husserl had already in the *Logical Investigations* highlighted that phenomenology aims to describe the experience from the first point of view in order to describe it exactly as it is experienced.

in Q terminology, concourse) is transformed into "pure consciousness" that can be grasped and communicated through Q sorts (Stephenson, 1988). The goal of the researcher in phenomenology is, however, to try to capture the subjectivity of the participant without interrupting the participant's process of understanding their experience, and to capture the subject's perspective without giving into the pressures of the social milieu (Stephenson, 1985). In other words, the researcher needs to let the participant understand what he or she has experienced, letting them go from elements of their own experience, and without moulding this experience to the expectations of others.

Whereas the output of phenomenological studies is a description from the viewpoint of an individual (or perspectives and essences in a Husserlian understanding), the output of Q takes the form of quantized operant factors. To Stephenson, these perspectives and the operant factors are comparable. He explains that elements constitutive of Q and elements constituting phenomenology are equivalent. In his 1988 text, he provided the example of Poole's language, in which corpus is the equivalent of concourse; description and comparison mean Q sorting; and perspectives are operant factors. Stephenson (1988; 1980; 1969) also explained that in Q, communicability replaces the idea of consciousness in Husserl's phenomenology.

Second, Q preserves subjectivity throughout the process of the Q study. Everything is self- referential, as it is built on naïve self-evidence, stemming from the participant's experience. Stephenson described the concourse as subjective because Q applies to the volume of meanings that can be understood from each element of the concourse. Each participant can interpret the concourse in their own context, as the concourse is not formed of objective facts. The concourse is especially self-referential "as consisting of the participant's own words" (Stephenson, 1988). The Q-sorting is subjective and self-referential as it results from the participant's own reflections. Stephenson (1991) compares the method of Q to the method used by James Joyce in *Finnegans Wake*, going from substantive to transitive thoughts (external thoughts to thoughts applied to the self; Allgood, 1999), which can be seen as the process triggered in participants looking at external statements and applying it to their own self.

Here, two interpretations are possible: the concourse comes directly from the individual, or the concourse is written in such a way that the participant can place himself or herself as "I" in the sentence. These two approaches are used in Q, with naturalistic and ready-made or theoretical concourses. The idea of self-referencing might, therefore, lead to thinking that all forms of concourse are equal. However, self-reference applies differently in each of them. To start this discussion, it is noteworthy that Stephenson underlined the potential for using the participants' own words, which links to phenomenology because it conveys the experience of the participant, rather than imposing an external frame onto it[4]. Naturalistic concourses should, then, be used for a phenomenological approach in Q. Shinebourne and Adams (2007) recommended that the concourse should stem from the participants. This removes the constraint to engage with statements selected by the researcher and allows the participants to express their point of view on the basis of their initial self-referential statements. The

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[4] Merleau-Ponty, in the book 'Phenomenology of perception' (1945), looked at the experiences of amputees in order to reach their particular experience without imposing pre-given theories through interviews. This is similar to what Q-methodology does when researchers assemble a naturalistic concourse from the participant's own words.

researcher thus draws closer to the phenomenological motto "to the things themselves". The researcher lets the experience manifest itself through the words of the participants, instead of imposing a lens to look at the experience through a predetermined concourse. McKeown and Thomas (2013) also suggested that a naturalistic concourse is one that is not foreign to participants.

However, it is rare that the concourse, even if naturalistic, is generated by one participant only. An exception is the single case study presented by Rhoads (2015), where the concourse was based on interviews with the participant. In this case, even if the participant was summarizing his or her point of view based on their own statements, those statements had been selected from the interview material by the researcher. It could be tempting to propose that the participant in this case should construct the Q sample, but this would grant him or her the role of a researcher, and thus distort the nature of the data collected. There is a limit to how naturalistic a concourse can be. In all other cases of naturalistic concourses that stem from the participants, the assertions included in the concourse stem from different participants (Shinebourne & Adams cite Kitizinger, 1987; Rayner & Warner, 2003). This diversity need not be a problem; Q often submits the same concourse to different participants to identify their shared perspectives. Self-referencing arises from the subjective interpretation of the concourse by participants. Each person sees meaning in the assertions of the concourse, based on their own experience. The concourse, and subsequent Q sample, help to reveal their experience to the participants by confronting them with their own and other participants' input (natural concourse); or with the researcher's or other non-participants' input – that is, a theoretical or ready-made concourse; or with both (hybrid concourse). The concourse allows for summarizing the viewpoint of an individual based on the elements presented to him or her. It is not a reduction in which the participant sharpens their own understanding of their experience (Stephenson, 1988). This shared concourse, together with the shared analysis, is a necessary condition to identify both the individual and shared perspectives (Shinebourne & Adams, 2007). This point gives Q an advantage over other empirical phenomenological methods, such as interviews. For interviews, such a comparison is possible only through the researcher's intervention, namely coding the data for patterns. The role of intersubjectivity in Q and phenomenology should be considered. Researchers must distinguish between the characteristics of single-case studies versus multiple case studies and should consider how phenomenology applies to each, which can lead them to estimate the concourse in one way or another.

Following Shinebourne and Adams (2007) and the aims of phenomenology, it is important for participants to express their points of view through their own perspectives. In addition to stemming from participants, the concourse should be expressed in their natural mode of communications. The format of the concourse is often adapted to increase its communicability to children. Q methodologists could increase the naturalistic aspect of the concourse by thinking of the format it takes and its compatibility with the modes of reasoning and communication of the participants. Designers, architects and artists might feel at ease when reacting to image-based concourses, whereas musicians might prefer reacting to sounds, and so on. A few examples of such concourses have been documented. Gauzente (2017) presented a ready-made concourse formed from paintings that had been assembled as an art exhibition by a gallerist, to other art gallerists. A change in format does not mean participants cannot constitute the concourse: they can collect these images and sounds themselves before Q sorting.

Going further with the idea of self-referentiality, the data provided when a participant proceeds several times to Q-sorting and which constitutes a "ghost field" for the quantumization of subjectivity, a matrix of probabilistics, and the operant factors resulting from it, are subjective and self-referential (Stephenson, 1988). They derive from the experience of the individual and how this experience was communicated in each Q sort.

Third, according to Shinebourne and Adams (2007), Q shares certain characteristics with traditional phenomenological research approaches. Both seek meaning "through exploring subjective accounts of phenomena from participants' perspectives" (p. 104). Q also shares with phenomenology the characteristic of "attempting to identify broad categories and common themes and a commitment to a collaborative engagement with participants" (Shinebourne & Adams, 2007).

Fourth, the process of analysis is congruent with phenomenology. Q methodologists and phenomenologists would agree on "psychological meaning", as described by Stephenson (1953; see also Giorgi 1970; Merleau-Ponty 1942/1963). That is, meaning cannot be ascribed in advance, so the researcher cannot in advance decide what the participants' responses mean. Rather, meaning is subjective. This point connects with Stephenson's idea that a Q sort replaces

> scales and norms for large samples of individuals, and measures of reliability, validity, and the like for every conceivable individual and social activity .... Q-technique called for only one scale, the same for everyone, for every Q-sort, for every problem, for only one attribute .... scored in such a way that everyone, for every Q-sort, gained score zero (m-0). A Q-sort literally measures nothing (Stephenson 1988, p. 204).

Indeed, as Q measures nothing, it eradicates all possible previous measurements and attribution possibilities. Cordingley et al. (1997) indicated that Q incurs less researcher bias than other interpretivist methods and gives more agency to participants. Taylor et al. (1994) also stated that Q has less researcher bias as it does not use predetermined scales and meanings. Q thus uses the phenomenological method of reflection, as described by the phenomenological psychologist Giorgi (1970). Indeed, Q researchers "examine the factors, Q items, conditions of instruction, and participant characteristics; reflect on these and other considerations; and eventually derive an interpretation, not of particular responses (...) but of factors and of the person's selfhood" (Taylor et al., 1994, p. 179).

The result of the study can "communicate 'profundities which conventionalized words cannot express' " (Stephenson, 1991, p. 140). That is, that the methodology leads to the unveiling of profound thoughts, which cannot be extracted otherwise. In Q, these profundities can be expressed as an outcome of the study and the result of the holistic approach: looking at the different elements of a Q sample and their relationship to each other can reveal meanings that were not there before.

However, the result of a Q study is also tied to the researcher's experiences. These will affect the interpretation, and so the researcher should be aware of them, but are "not imposed on the participants' answers *a priori*" (Taylor et al., 1994). The impact of the researcher's perspective is made more evident when considering the representation of factors in a multidimensional space, which is a result of the Q factor analysis. Each factor is not considered from within, but rather through the perspective of the researcher looking at the factor from the outside.

Q methodology focuses on the self-evident elements of the experience, so the phenomenon itself is the object of study, allowing the researcher to reach the truth in the Husserlian sense (Stephenson, 1980). Q studies have a descriptive character, which should be preserved as such. Q methodology is in essence a qualitative approach, which uses quantification only to highlight the objectivity embedded in a subjective experience. In this sense, it does not generalize as quantitative methods do.

Like phenomenology, Q is aimed at revealing individual perspectives. However, Q studies are often pursued to explain a phenomenon, whereas phenomenology aims at pure description. Q studies also aim at comparing individuals' perspectives, with researchers interpreting the meaning of any consensus or disagreement across individuals.

The implications of this congruence, and the discrepancies between phenomenology and Q, should be considered when designing the set-up of empirical Q studies.

Empirical implications

The implications of the characteristics which Q shares with phenomenology are not clear from the literature. For instance, the idea of self-reference seems to lead to favouring estimations of concourse in a naturalistic way. Yet, this very same concept can be applied to statements, with the result that the participant places himself or herself in the statements even if they originate from somewhere else, allowing the generation of concourses in a different manner and enabling a study of intersubjectivity, a matter which is at the heart of Q.

It must be underlined that the discourse relating to naturalistic concourses tends to apply to single-case studies. Yet such an application is not common among Q studies. Single case studies are rare: Brown and Rhoads (2017) provide a list of just 16 published single case studies. There are only a few studies where multiple participants have proceeded to a Q-sorting exercise involving several conditions of instruction (Gauttier & Gauzente, 2018).

In addition to these matters relating to the origin of the concourse, researchers must also consider the Q-sorting process. This process allows participants to keep control over the account of their experience; they control the classification as they rank the assertions. Brown (1980) showed that using a forced distribution matrix does not distort the structure of elements from the participants' perspective. On the contrary, the process of sorting allows participants to establish hierarchies, relationships and priorities by themselves. Other phenomenological methods encounter difficulties in doing so. For example, phenomenological interviews allow participants to express their point of view, but the hierarchical ordering of topics is difficult to obtain from the participants themselves. It is thus constructed by the researcher during data analysis.

Furthermore, we have identified a discrepancy between the descriptive aim of phenomenology and the interpretative aspect of Q research. We recommend the following process to reconcile analysis in Q with the phenomenological approach. The researcher should first describe the factor, and then interpret the factors – that is, explain why they are present and how they relate to other theories. This principle is not always respected in the Q literature, for two reasons. First, researchers can be tempted to look for theoretical elements in the Q sort and to describe the results only through that perspective, without exposing the perspective of the participant; that is, the researcher interprets directly. Second, the researcher might relate the factors to theories and other scientific knowledge without considering the participant, the set-up of the research, or the origin of the concourse (Taylor et al., 1994).

It can also be that the researcher attempts to represent their own experience in a factor. Researchers can capture their own personal perspectives. They can also choose to do the Q sort from the perspectives they believe research participants will have (Gauttier, 2017). While such an undertaking does not solve the problem of an interpretation from within, it has the merit of making explicit what is the positioning of the researcher and to understand from which perspective he or she apprehends the topic. Here Q can offer more transparency on the issue of description and interpretation, which is a topical issue for phenomenological methods (Gauttier, 2017).

After this, the researcher might link the knowledge created through the Q studies to other knowledge. Adopting a phenomenological approach could therefore impact on how one proceeds to the analysis of the data, without the analysis being intended to contribute to phenomenology.

Table 1 presents a summary of the common characteristics of Q and phenomenology, and the implications for realizing future Q studies. The literature can be utilised to influence the following aspects of Q studies: concourse constitution, sample constitution (a justification for single-case studies), and the presentation of results.

Table 1. Commonalities between Q and phenomenology

Commonality between Q and phenomenology	References	Aspect of Q studies influenced	Implications for research design
Goal of studying human experience	Taylor et al. (1994)	Research question	The research question focuses on identifying a subjective experience.
Using the naïve self-evidence produced by individuals regarding their experience	Taylor et al. (1994)	Concourse	The research set-up must use a naturalistic concourse (Shinebourne et al., 2007; McKeown and Thomas, 2013). The impact of the origin of the concourse on results must be investigated.
Role of researcher is to allow participant to find out their truth about their own experience	derived from Taylor et al. (1994)	Conditions of instruction	The research set-up must consider each individual as a single case and multiply Q sorts to better understand the individual experience (create the "ghost field" for quantumization) (Stephenson, 1988).
From participants' perspectives	Shinebourne et al. (2007)	Concourse Analysis Interpretation	The use of a naturalistic concourse (Shinebourne et al., 2007; McKeown and Thomas, 2013) is needed. Measures to ensure proper description of each view should be taken: description and then clearly defined interpretation (researcher's voice). Representation of the researcher's perspective on participants' points of view (Gauttier, 2017)

| No meaning can be ascribed in advance | Stephenson, (1988); Taylor et al. (1994) | Interpretation | The researcher must refrain from imposing theoretical constructs on the reading of the factors (at least as a first step). The researcher should be aware of how their own experience can shape their understanding. |
| No sense of generalization as in statistics | McKeown and Thomas (2013) | Interpretation | The researcher must refrain from describing results as if representative of the general population. |

The link between Q and phenomenology has been established by looking at what Q methodology does and the shared goals and constitutive elements between Q and phenomenology. There is a shift from intensive studies, looking at the perspective of specific populations in depth, to discussions of extensive studies suggesting that the size of the P set and numbers of factors to be identified are related (Baker et al., 2006). The role of statistical approaches is getting more and more attention (Akhtar-Danesh, 2017; Ramlo, 2016). The idea of a qualitative, phenomenological positioning of Q has not been as widely discussed. However, the ways in which the methodology is applied can bring it closer to or move it further away from it being a useful phenomenological tool. If Q is congruent with phenomenology, how can elements of phenomenology be used to improve the quality of the data collection in Q?

Elements pertaining to the conditions of instruction in Q studies are neglected in the literature. These include, for example, the perspective from which Q sorts can be performed or the number of sorts that participants can be asked to perform. We surmise whether certain conditions for instructions and research design might help in designing Q studies with a stronger phenomenological approach. We argue that applying the concept of variation to Q creates new opportunities for the design of phenomenologically-inspired Q studies.

Introducing the Concept of Variation into Q Methodology

Variations in phenomenology

In phenomenology, eidetic variations[5] are important to highlight the essences (eidos) of the object perceived (Uehlein, 1992). Subjects have perceptions of objects, but the essence of these objects is not manifest since it is constantly "covered" with contingent elements. Even if the essence is directly perceived by the subjects as an integral part of their experiences, it is not directly "visible".[6]

For example, when a person perceives a cup of coffee in the morning on the table in front of them, they perceive not merely the "cup of coffee" in its pure essence; they also perceive that specific and contingent cup of coffee, with its specific temperature (hot), color of the cup (white), shape (designed by IKEA), aroma (aroma of a specific coffee),

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[5] This method raised many questions within phenomenology as it has been criticized of a potential circularity since the terms type and essence risk being too closely related (Levin, 1968).

[6] This method can also be used in geometry (Tieszen, 2005).

and so on. All these elements, even if they constitute the experience as lived by the subject, are not part of the pure essence of what a cup of coffee is. They literally wrap the pure eidos, making it hidden even if present.

To make the essence manifest and to "unveil" it, the subject needs to perform variations of such an experience. The subject needs to imagine different possible configurations of that experience to highlight its different possible connotations. The cup of coffee is perceived according to a specific point of view, but it is possible to turn the cup around and to have a different perception of it. The subject might experience the cup of coffee as hot because of the boiling coffee inside but could experience it as cold as well. They can also vary the experience through the use of technologies like lenses, or by modifying some elements in the environment, like the light in the room (Liberati, 2015).

All these variations highlight different possibilities of the perception of a cup of coffee, and they all have something in common. At the same time, certain things differ and conflict with other possibilities. For example, the fact that the cup of coffee is hot clashes with the possibility of it being cold. According to Husserl, in the third logical investigation, following Stumpf's ideas (Husserl, 1984, §§ 3-6), through the mere overlapping of these conflictual possibilities, what is constant emerges and it constitutes the essence of the experience.

Such a method has different names, according to which aspect of variation the analysis is focused on. The variation is called "free variation" (Husserl, 1963, 167) because of the freedom involved in the process. The process of varying the content is decided by the free subjects, who decide when to start and when to end it. Ideally, the process covers all the possibilities to highlight the pure elements of the eidos (Husserl, 1980, pp. 552–553). Obviously, even if this infinite variation of the elements is ideally possible, it is not achievable in the finite life of human subjects. However, this impossibility does not preclude access to the eidos since Husserl makes clear that it is possible to grasp the general idea of sets of variations and to consider them as one. Once the subjects understand that the cup of coffee is not related to a single element like its temperature, it is not important to iterate the variation on this element anymore.

The variations are also called "imaginative variations" (Husserl, 1968, 174) since this is a process founded on fantasy and imagination. The subjects do not need to empirically perceive the variations, but they can think of producing possible experiences through their fantasies. Even unreal experiences are accepted in the process (Husserl, 1973b, pp. 546–548). Moreover, the variation is also called "eidetic variations", which highlights the emergence of eidos as its product.

We have shown that Q and phenomenology share the same goal and the same underlying ideas of revealing experience for itself. Additionally, we have also shown how phenomenology uses free variations to reach the pure essence of an experience, Therefore, this method can be applied to Q to reach the same goal.

Variations in Q methodology

Q can use variations to allow participants to grasp and make visible the eidos of their own experience. The concept of variation implies that the subject – or in a Q study, the participant – imagines a change in the experience[7] so that they can continue to reflect on it. The different assertions provided in the concourse are elements of the experience,

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[7] For examples of the use of variations in other phenomenological empirical methods, see Turley et al. (2016).

which the participant can classify as neutral or irrelevant, while sorting which elements are relevant. In this process, the subject uses a specific perspective from which to view the experience.

   A variation can be introduced to seize the eidos of the experience, reflected in the configuration of assertions. This entails intervening in the conditions of instruction of the Q sorting process. That is, the researcher can ask participants to proceed to several Q sorts, from different perspectives. This should lead – continuing the earlier example – to perceiving the cup of coffee[8] differently. When Stephenson (1988 p. 206) mentioned that "the different Q sorts, for different aspects of the event, correspond to 'ever-renewed self-reflections'" and made a parallel between these self-reflections, infinite interests, and phenomenology (Stephenson, 1991), he suggested the use of several Q sorts per participant for the purpose of variation.

To start with, two types of variation can be identified in the Q literature:

   1) Variations in the perspective adopted by the person performing the Q sort.

   Stephenson (1983) did provide some recommendations regarding the design of conditions of instructions for single-case studies. He did emphasize the possibility of structuring them around components of the psychological event and mentioned several aspects: the medium around the event, the setting of the event, the historical retrospective, and the response function. The examples he provides focus on the perspectives of the participants at given points in time, and the perspectives of others. He did not see these elements as limiting but suggested that researchers add conditions based on "known laws", implying that the conditions should be justifiable from a theoretical perspective.

   In practice, these recommendations are rarely followed. We reviewed papers identified by Brown and Rhoads (2017) as featuring single-case studies to identify strategies for specifying conditions of instruction. However, these studies have not claimed any phenomenological positioning. 10 papers provide minimal explanations, looking at the perspectives of participants or the perspectives they think others have of them, or those that fictional characters would have (see Appendix A). In addition, the personal context of the individual could be the object of variation – such "this experience thinking of you disabled, you divorced and so on. A change in the subject can be triggered, such as asking the participant to carry out the Q sort from the perspective of different objects (Baas, 1979).

   In order to design conditions of instruction and keep them at a manageable number, one needs to choose *relevant* conditions of instruction. Researchers choose the variations they see as mostly fitting, either due to theoretical concerns (Brown, 2006), or because they represent the entirety of characters in a book under investigation (Stephenson, 1986), or because they seem to mirror a protocol, looking at perception before and after some element is introduced

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8 It should be understood that Husserl's phenomenology usually takes into consideration objects as "object of perception" while Q focuses the attention on action/behavior. However, phenomenology is not merely limited to perception, and it engages also with action by taking consideration of the "I can [Ich kann]" of the subject. Enactivism, especially, highlights this tight relation between what is perceived and the action underlying it (Noë, 2003; O'Reagan and Noë, 2001).

(Gauzente, 2014; Gauttier and Gauzente, 2018). Such an approach is based on the perspective of the researcher. Rather, to design proper variations, one could imagine thinking of *relevance for the subject him- or her-self.* Here, an example given by Baas and Brown (1973) needs to be considered: the authors derive from their question that the private and socio-political spheres are important to structure their Q study. They cannot a priori decide which are the elements of these spheres but engage in a conversation with the subject to catalog the objects of these two spheres and see which ones seem to be salient. They then obtain a list of 30 aspects, broken down into pertaining to the self domain, the primary domain (related to family and the private sphere), or secondary domain (including political figures). It is noteworthy that their approach leads to variations that are much more precise than one can see in contemporary studies. For instance, the perspective of the mother exists as: 1) mother and 2) mother as she was once I was angry with her (the situationally "bad mother"). Such an approach is also deeply compatible with phenomenology as it does not impose external perspectives but aims at revealing the perspectives present in the individual and salient in his/her experience. Other perspectives, seen as probably important given the research topic, were considered as well. Probing the participant and designing the study on this basis is one methodological avenue to consider in order to realize the criterion of relevance to the participant.

Probing the participant is achieved by looking at the spaces surrounding the participant in his/her experience, and not by looking at "participants" in general and in a vacuum. It is about identifying the elements of the lifeworld, the objects and elements arranged in space and time in relation to the perceiving object in a given experiential space. Here, we see how Q can be embedded in a phenomenological study, in combination with other phenomenological methods (interviews for probing), so that Q does not do phenomenology on its own. When it comes to the choice of variations in the Baas and Brown study (1973), elements of the lifeworld are disregarded, and variations around individual figures are chosen. While this aligns with their concern with the social and political, it cannot be recommended for all studies. Variations based on the lifeworld, the experiential space, should also be considered. To date, variations are however often linked to imagining an experience through the eyes of someone else, and not through the eye of the participant with elements of the experience changing.

2)   Variation in the format through which the concourse is expressed.

This could help participants grasp the eidos of their experience better. To date, Q studies have used different formats for the concourse. Text is the most widespread, for instance, and almost any study could be cited in this regard. Yet, as Stephenson (1991) reminds us, we are looking for profundities which conventionalized words cannot express. Perhaps looking at other ways to express the thoughts of the participants are needed. Pictures or images have also been used in Q studies (Gauzente, 2017), and there have been discussions of the idea of using maps (Q-Method List, Veland, 2018). The possible use of and sounds has been mentioned in the literature. Yet, to our knowledge, no study to date has used concourses from these different formats together. Such a proposition raises several issues. First, participants need to reflect on elements stimulating different senses in one single exercise. Second, to interpret results, the meaning of odours, sounds, pictures,

should be shared between researcher and participants. This can be difficult to achieve. However, these Q sorts could also be considered an intervention that allows participants to reach the eidos that would be captured in an ad hoc concourse covering in one format the different themes

This leads to a consideration of how one can choose in which formats the Q sort should be expressed. Here, we refer to the underlying principle of the research by Baas and Brown (1973) and interrogate the participant. Two elements informing the choice of variation can be identified in this initial conversation: 1) elements related to how the participant better expresses him/herself, that is in words, drawings, sounds, and so forth; 2) elements describing the importance of images, colors, or of the sounds surrounding an experience, which makes these dimensions relevant variations to have as they allow one to cover another dimension of the topic studied.

In both cases, the number of variations to establish also needs to be justified. In their research, Baas and Brown (1973) compare the universe of 30 variations to a sample of 30 participants, suggesting that one can be satisfied with a number that meets usual sampling criteria. However, it could be argued that sample sizes have little relevance for Q and the 30 universes represent 30 universes within the representation of one participant. Rather than following up this suggestion, we propose using the list of relevant universes and formats identified with the participant. The limit to the number of universes to consider is be dictated by a criterion of exhaustiveness, that is, all potential universes are being mobilized to create the Q study. The above researchers did not explain why they settled on the variations they used, nor did they explain how they limited the number of variations. In introducing the idea of variation in Q, we must also think of criteria to help researchers make appropriate decisions about their research design. Such criteria are a priori difficult to establish through phenomenology alone, since it posits that the possible variations are infinite. Some guidelines can be found in the literature and in common practice. For instance, the involvement of participants in grasping a better understanding of their eidos can help determine how many variations can be performed. Once the participants know that they have grasped a better understanding of their experience and that another variation will not help to refine that understanding, or would be too tedious, the variations should stop. Other guidelines might be imported from other phenomenological research methods: researchers could stop the variations when overwhelmed by the amount of data or the data is saturated. Researchers could also stop variations when there is no more time left to perform them, thinking in a very practical manner about time management in research (Englander, 2007 mentions this about phenomenological interviews). However, some types of variations can be proposed to stimulate thinking among researchers. The identification of the specific variations to use can be decided using techniques respectful of phenomenology and less opaque than saturation, management, and being content with one's self-reflections.

From this analysis, it seems that most variations deal with changes in the subject. However, perception and experiences could be apprehended through a series of dimensions which are barely considered in the Q literature. Gauzente (2014) experiments with time perspective. Geography, technology (using or imagining an experience as lived with the use of another technology), or even the context (for instance, light in the room) could be a source of inspiration for conditions of instruction.

Identifying the Variations Relevant to a Q Study with Phenomenology

We propose a change of perspective in how variations are designed. This change implies that we stop deciding on and imposing variation from the outside and according to criteria pertaining to the researcher's perception, but rather design them so they emerge naturally from within the experience of the participant. Such an approach would allow one to break free from designing conditions of instruction that are often focused on gathering the perspective of a person and the perspective that person imagines to be for others. As mentioned above, many studies do not justify how these variations are created. Instead, we propose to consider the elements of the experience, including people and changes in the state of the subject, that are salient in an experience as mentioned by a participant. These elements become conditions of instruction. That is, there is a shift from looking at external perspectives on an experience and a focus on the elements constituting the experience. While these elements can focus on the subject and be variations of the subject's emotional states (Stephenson, 2017), in our approach they are not limited to this. Using the concept of horizons in phenomenology, we can identify variations that address elements present in the experience, as could be identified through interviews prior to Q-sorts. . For instance, a Q sort on a day at the beach can be done under several conditions of instruction whereby the elements of the horizons of this experience change. It could be my experience of the beach in a touristic resort, my experience of a small beach near a forest, my experience of the beach with my friends, my experience of the beach with my nieces, and so on. The issue becomes how to identify which of the infinite possible variations are relevant to be included in the Q study. We can follow the classic elements we find in perception according to phenomenology in order to organise the type of variations into classes. In phenomenology, every object is presented to the subject with three different horizons: inner, outer, and world (Geniusas, 2012; Held, 2003; Liberati, 2016). In this sense, we suggest the underpinning of the design of conditions of instruction in what could be called laws of perception, in line with Stephenson's understanding (1983).

The inner horizon relates to the simple fact an object never gives itself with all of its aspects at once, but always hides some of its elements. These hidden elements are elements which might be perceived by the subject the moment they decide to act in a certain way, and they are located "in" the object. For example, a "day at the beach" has different aspects which are "in" it, but which are not directly perceived by the experiencing subject, like the smell of the sea while walking on the sand, if the subject is not close to the water. The smell of the sea is not manifest to the subject, if the subject is not close to the sea, even if the smell is "in" the experience of the "day at the beach".

The object has also an outer horizon which is related to what is "out" of the object. Many elements which are not "in" the object perceived still provide the context for and meaning of the experience. For example, the "day at the beach" relates to what the subject associates with that beach. Whether the beach is surrounded by a parking lot or a forest will influence the experience of the subject of a day at the beach. These elements are not "in" the day at the beach", but they provide important connotations of such an experience.

The third horizon is the world horizon. This horizon is much larger than the previous ones and it does not relate to a specific element in the world, but it is related to the experience of the subject in its totality. It reflects the fact every experience is related to the entire life of the subject. We can think of this horizon as the "horizon of all horizons" since it is the one which allow the experiences to link to each other. The "day at the beach" is not merely one experience, but it relates to every experience of the subject

which might also provide a specific way of perceiving the beach by making him/her remember some elements of past experiences. Moreover, it also provides the openness of that experience to the future experiences of the subject by connecting the experience with possible future experiences. Thus, this horizon provides the "position" of a certain experience within the life of the subject. For example, if the person had their first romantic experience on a beach, the "day at the beach" might be perceived in a different way than that of another person who had had a traumatic experience on it.

All three of these kinds of horizons can be the object of our variations. We can think of making infinite variations to the experience of a "day at the beach", and, thanks to these three different horizons, it is also possible to classify these variations in three main groups: he ones related to the modification of the elements in the inner horizon like, for example, modifying the smell of the sea that a subject perceives while walking on the sand: the variations of the elements in the outer horizon related to the context of such an experience like what is "around" the beach as in the case of a useful parking place or the forest which make the beach more isolated: and the variations of the elements in the world horizon related to every other experience of the subject like in the case of past memories associated with a day at the beach.

In addition, we can also think of another class of variations in relation to the subject. We can think of different aspects of the subjects which might change the way they live the experience. For example, the sensibility of the subject's skin to the sun, whether or not the subject is sunburnt, changes the way the "day at the beach" is experienced. Whether or not subject has blue or dark eyes changes the way they have to squeeze their eyes on a sunny day at the beach.

These variations are focused on what is part of the experience. Stephenson's suggestions were focusing on others' perspective (Stephenson, 1983), even if he acknowledged that phenomenology – and to a certain degree Q - are meant to identify the transcendental ego of the individual without the "pressures of the social milieu" (Stephenson, 1985). The development of conditions of instruction based on the horizons of experience of the participant allows one to take a step back from looking at others' perspectives and, being in line with phenomenology, reconciles this discrepancy,

These horizons and capacities of the subject can be adapted to identify relevant variations for Q studies (see Table 2).

Table 2. Applying horizons to identify variations

Horizon	Inner	Outer	World	Subject
Elements of definition	Elements of the experience itself	Elements peripherical to the experience that provide meaning to the experience itself	Elements not present in the experience itself but that impact the experience as the latter should be seen as related to all the other experiences one has	The person who perceives the experience
Variation for Q	Change in the places, people, objects, sounds, technologies constituting the	Change in the places, people, objects, sounds, technologies	The elements in relation to the experience but which are outside of	Change of condition of the subject (sunburnt or not, sick or not), change of the characteristics of

	experience	which are around the experience	the experience itself. - Temporal relation: what is before or after the experience, memories - Cultural relation: in another setting	the subject (already exposed to the experience or not)
Prompts to identify the variations	Can you describe to me a specific example of when you had this experience?			
	When you think about this experience, what do you see? Hear? Smell? Try to imagine you moving around the scene and looking at different details of it.	What is happening next to this scene? What is present around the scene?	Do you have memories of a similar experience? An idea of this ideal experience? What does this experience make you think of? Describe them.	Who participates in this experience? In whatstate are they? How do you feel when you are in this experience? How are you in the experience? Think of experiencing it in a different body.

Identifying the variations requires an understanding of the specific experience under consideration. Indeed, they cannot be imposed by the researcher but must come from the elements that allow the participant to understand his or her experience. The elements of the different horizons can be obtained following the method of Baas and Brown (1973): as one interviews the participant on their specific experience, the salient elements of the experience can be identified. Participants should be interviewed by asking them to describe the experience, following guidelines for phenomenological interviews. Additional prompts can be used to circumvent all the horizons and assist a participant in telling his story. The prompts are always aiming at eliciting a more thorough description, not at checking a theory. The researcher, by varying the experience (inner, subject) and/or their correlates (outer, world) thus manages to obtain a variety of perspectives and experiences for the study, while using just one participant.

The variations can also be experienced through technologies such as virtual reality. This is especially true for a variation in the subject, as it is possible to make the subject experience a different body in virtual reality. After the virtual reality experience, the researcher can ask the subject to explore their memories, thinking about the body they have just experienced.

An Illustrative Q Study Design Structured with Variations and Horizons - A Single-Case Study of the Experience of a Stress-Monitoring Wearable

Following on Stephenson's practice, we illustrate our proposition with a single-case study performed with the researcher as a participant. Single-case studies by definition require having the Q sort performed under several conditions of instructions so as to have several sorts to factor analyse and to identify the multiple views within an individual. We show how our proposition can be applied, how the conditions of

instruction identified through the horizons differ from those identified with the social perspective and demonstrate that the views stemming from it are clearly distinct from each other.

In this case, we are investigating the experience of using a stress-monitoring wearable for a week. With the Q study, our aim is to identify the different facets of the experience and in which condition each of these elements takes on more significance. The researcher used the wearable in preparation for a wider field experiment where employees of an organisation would wear the device at work and at home to measure their stress.

The researcher used the stress-monitoring wearable Empatica E4 for a week, employing different functions such as monitoring data in real time on a smartphone or looking at the data at a later time on the accompanying computer software. The Empatica E4 measures different physiological data such as skin conductivity, skin temperature, blood pulse, heart rate, movements, and so forth. The design is simple: the device has the shape of a watch and there is no screen on it. There is only one button that can be pressed to tag a stressful moment that can later be retrieved from the data. There is also a little led which is off when the device is working and signals only when the device is switched on, when it needs to be charged, and when data is streamed.

In addition to using the device, the researcher kept a diary, noting down their sensations related to using the wearable and any thoughts about stress. This diary provided the basis from which the concourse was identified. The text was analyzed from a thematic perspective. One statement was selected for each theme. 32 statements were retained and can be consulted in Appendix B.

The conditions of instructions were then selected. First, they were designed following the approach of Baas and Brown (1973), that is by focusing on the social aspect of the experience. Such an approach leads to reading the diary and identifying the significant others or individuals mentioned. This leads to considering the following perspectives:

1) Researcher's perspective, that is, what is seen as mattering more for the research. This perspective is made mandatory by the set-up of the research. Reading the diary, it is also possible to identify concepts from the scientific literature related to the study of stress - induced by the use of technology (for instance, technostress). This shows that trying the wearable as a researcher preparing an experiment leads to a specific point of view.

2) Individual perspective, that is, the experience of the researcher as a regular individual, which is motivated by the presence in the diary of mentions of individual thoughts, about how the researcher-participant sees herself through the device.

3) Perspective of others, as the device is worn outside of work as well and so is seen by family and friends. This is visible in the diary, as several days the researcher-participant takes notes about the visibility of the device as she needs to attend several events at the university and with friends on that week. This can be split into two:

   a. Perspective of colleagues
   b. Perspective of friends

The perspective of other individuals not related to the researcher, but who saw the researcher wear the wearable, was never mentioned.

Other individuals are not mentioned in the diary, which seems to indicate that the perspectives we can identify by following Baas and Brown (1973) are limited to the four mentioned above. Would this Q study not be designed with the principles of phenomenology in mind, a further list of perspectives could have been imagined in line with the researcher's interest. The perspective of individuals rejecting the technology could have been added to this mix, as well as the perspective of individuals experiencing technostress. That is the results would have been showing all that the researcher imagines of others and allowed to position the researcher in relation to what she thinks of others.

Applying the framework on the design of conditions of instructions based on the phenomenological concepts of variations and horizons, we analyze the diary to identify elements marking the different horizons and the subject. These elements become conditions of instructions: 11 conditions of instruction were identified (see Table 3). The inner horizon was identified as mainly described through the perspective of the duration of the experience, with significant remarks contrasting the first day of use with prolongated use. The outer horizon was identified as the surroundings in which the experience take place, as the diary shows notes on whether or not the researcher-participant is at work, at social events, or at home. The world horizon is constituted of experiences the researcher-participant has had in the past, such as monitoring one's heartbeat with a Holter for medical reasons; of the technologies the researcher-participant has knowledge of such as insideable technologies; and of a representation of what an ideal experience would be. There are also variations on the subject, depending on the state of the researcher-participant, with conditions of being stressed or sick being mentioned in the diary. A final variation is looking at the point of view of the researcher as such, while other dimensions address the lived individual experience.

Three of these conditions cover the inner horizon, two cover the outer horizon, three covers the world horizon of the experience, and three cover the subject.

Table 3. *Conditions of instructions identified in relation to horizons*

Horizon	Inner	Outer	World	Subject
Condition of instruction	First use	At work	Holter experience	Stressed
	Prolongated use	Social event	Ideal experience	Sick
		At home	Insideable	Researcher

Here, it is noteworthy that we are looking at the experience of a device that does not have many points of interaction with the user, and so the inner horizon looking at what is inside the experience, inseparable from it, is rather limited.

From this, we can already see that the type of condition of instruction we have designed by applying the framework of variation is different from conditions of instruction we would have obtained using traditional approaches. Here, we do not speculate on what the participant imagines to be the point of view of others (looking outside of the experience), but rather we ask the participant to focus on key points of the

experience (looking inside, zooming in) in order to reveal the plurality of experiences embedded into wearing the stress-monitoring wearable. As in prior Q-studies, we ask the participant to imagine some experiences which have not occurred, such as the ideal experience or imagining the experience would happen with insideables. However, these conditions of instruction are already embedded in the notes and experience expressed by the participant: we asked what a similar or ideal experience was. Therefore, we assume that the conditions of instruction we formulated are more suited to highlight how the experience is structured.

The researcher-participant proceeded to the 11 Q-sorting exercises over three days, which helped avoid getting tired from the exercise and a focus on each condition of instruction independently. The order in which the Q sorts were performed was random.

The Q-factor analysis was performed using KenQ. The analysis used Principle Components factor extraction followed by Varimax rotation. 4 factors, including two bipolar factors were retained, revealing the complexity and plurality of points of view involved (see Table 4).

Table 4. Structure of each factor and explained variance

	Factor 1a	**Factor 1b**	**Factor 2**	**Factor 3a**	**Factor 3b**	**Factor 4**
Social Event	0,0745	-0,0745	-0,5149	**0,5369**	-0,5369	0,1279
At home	-0,1226	0,1226	0,0134	-0,0218	0,0218	**0,9152**
Insideable	0,387	-0,387	-0,0926	0,0266	-0,0266	**0,7316**
At work	-0,0809	0,0809	0,2359	**0,8486**	-0,8486	0,1311
First use	-0,7948	**0,7948**	-0,1538	0,0232	-0,0232	0,0031
Holter	-0,024	0,024	0,2323	-0,6382	**0,6382**	0,1287
Sick	**0,6724**	-0,6724	0,3045	0,1567	-0,1567	0,2414
Ideal	0,4694	-0,4694	-0,4161	-0,4572	0,4572	0,1656
Prolongated	-0,067	0,067	**0,7882**	-0,0297	0,0297	0,0675
Researcher	0,2047	-0,2047	**0,7832**	-0,0111	0,0111	-0,0874
Stressed	**0,6089**	-0,6089	-0,2848	-0,114	0,114	-0,034
% Explained Variance	17	17	18	15	15	14

The factors, or views, are not necessarily composed by Q sorts pertaining to one same type of horizon, even if it can occur as well, suggesting that the different horizons are indeed complementary to each other and that there is a need to capture each with various conditions of instruction. For instance, factor 4 is significantly centered around a Q-sort on the world horizon and one on the outer horizon, which are respectively "at home" and "insideable" and point at the private character, internal aspect, of the experience. Factor 3 is bipolar and opposes the outer horizon, especially here in terms of location where the experience takes place, and the world horizon as in the past experience had by the participant when wearing the holter, which suggests a view highlighting the new character of the experience of the stress-monitoring wearable in social contexts. Factor 2 is focused on the researchers' perspective as preparing the experiment and the prolongated experience of the wearable, which makes sense given that the researcher was focused on understanding how future participants might experience prolongated use. Factor 1 seems to be focused on the individual experience

of the researcher, with a first view around the individual states in which the researcher has been during the experimentation (sick, stressed), and opposing it to the first use of the device. It might, therefore, be that the initial use is specific enough that the individual state of the subject is not structuring this experience. The conditions of instruction designed along the different horizons therefore seem to allow for a rich interpretation of the factor structure.

Discussion

We have shown that Q is congruent with Husserl's phenomenology at different levels. Q and phenomenology share the same goal of capturing the essence of experiences by going to the things themselves. Both methods agree that the "truth" of an experience is self-referent and can be expressed by the subject of the experience (the participant in a Q study). This has implications for how researchers create and understand the concourse they use for Q studies, in terms of its origin and format, as well as the interpretation of assertions. It also affects the interpretation of results.

In addition, we suggested that Q could use the same tools as phenomenology to reach its goal. To that end, we introduced the concepts of variations and horizons and showed how they can be applied in Q studies to design conditions of instruction. We have also shown that until now, these conditions are designed with a strong focus on capturing imaginative variations with a strong social component, while other variations and horizons of experience are not considered. The framework we proposed allows the design conditions of instructions which are relevant to the experience itself, while still considering potential changes in the subjects. Future Q studies could be developed in the phenomenological manner we described. Indeed, it appears from our application of thet framework that more conditions of instructions could be elicited by applying the idea of horizon rather than that of surveying the social aspects of the experience. Yet, this number of conditions (amounting to 11) is seen as manageable. Future research applying this approach to the design of conditions of instruction is needed in order to assess that a manageable number of conditions is indeed found, especially when using interviews instead of written notes, where one might talk more than one writes. Furthermore, applying the concept of horizon to design the conditions of instruction allowed us to identify six relevant views on the experience of using a wearable for stress-monitoring. Going from within the experience seems to be a plausible road to follow as it can be enough a variation to identify different factors.

In grounding Q in phenomenology, further reflection is needed on the role of intersubjectivity, whether by considering the impact of using concourses stemming from different individuals, or simply by thinking of the role of the researcher in describing and interpreting the participants' experiences. We have shown that a concourse deriving from sources external to the participants can be interpreted in a self-referent manner by each participant, allowing them to convey their own individual experiences. However, we have also indicated that such a use of Q – especially with variations grounded in different types of horizons of perception – can help participants to access the truth of their experience. This does not automatically exclude the possibility that others cannot be part of the inner, outer, or world horizon and that the intersubjectivity that is inherent to an experience cannot be captured through it, but rather suggests that others become relevant if they have a key role in structuring the experience.

Conclusion

Investigating the links between Q methodology and phenomenology allowed us to reconsider our Q methodology practices Far from narrowing our understanding of Q, the investigation revealed the flexibility of the methodology and the creative opportunities it offered researchers. Our analysis also provided a rationale to ground Q methodologists' choices when designing their Q studies. It led us to reconsider how conditions of instruction are designed, especially for the purpose of single- case studies, and to propose a framework to identify the horizons of the experience and use them to design the conditions of instruction (variations). Through an illustrative single-case study, we have shown how using this approach leads to the revealing of relevant views to understand a phenomenon.

Explaining the links between phenomenology and Q can empower researchers who are accustomed to phenomenological empirical methods to grasp and utilise Q. The vocabulary and tools of Q methodology can be translated into a language employed by the wider community of phenomenologists.

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