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Research Article:

A Scoping Review of L2 Studies Employing Q Methodology

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ABSTRACT

This article presents a scoping review of research on learning and teaching a second or a foreign language (L2 research) that employed Q methodology. The main aim was to assess the published Q studies on language learners' and language educators' opinions and beliefs concerning a variety of personally and socially important issues. This review was implemented according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A search of three academic databases was conducted, namely, Academic Search Complete, Scopus, and Web of Science. Titles and abstracts of articles in these databases were subjected to the inclusion of the terms 'Q methodology/Q method', 'language learning', and 'language teaching'. In total, 53 relevant articles published in English language peer-reviewed academic journals between the year 2013 and 2023 were analysed. We examined the geographical distribution of L2 studies that employed Q as well as the topics and key methodological decisions made by their authors. This scoping review found evidence of growing popularity of Q methodology among L2 researchers, particularly over the past 4 years. The published articles explored a wide variety of issues, including L2 motivation, language beliefs and novel for L2 research topics, such as boredom in the L2 classroom and language teachers' moral distress. This scoping review concludes by considering implications for future development of L2 research employing Q.

Keywords: Q methodology, L2 research, language learning, language teaching, scoping review

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INTRODUCTION

Language learners and their teachers have their own beliefs, views, and opinions about what learning and knowing a new language involves. They also experience a range of emotions, both positive and negative, in a challenging endeavour of mastering a new tongue. In short, learning – and teaching – a new language is saturated with subjectivity. Traditionally, language learners' subjectivity, including their beliefs about learning a new language and a host of psychological factors that are always present, have been explored by quantitative methods that used Likert-type self-report measures and a range of statistical procedures (Barcelos & Kalaja, 2011). However, there is a growing understanding that exploring this subjectivity demands appropriate methodological approaches. Q methodology, or simply Q, gives researchers ample affordances for deeper explorations of a variety of beliefs, opinions, feelings, and emotions that language learners and language educators experience in the process of learning and teaching a second or a foreign language (L2).

Q methodology has almost a one-hundred-year history since it was first introduced in the 1930s by a British physicist and psychologist, William Stephenson (1935a; 1935b). In recent decades, Q methodology has gained recognition in various academic disciplines, including political science, psychology, education, and nursing, to name just a few. In L2 research, Q studies explored traditional topics of interest that attracted L2 researchers' attention for decades (e.g., L2 motivation, anxiety in the language classroom) as well as emerging topics, such as epistemic beliefs of language learners (Wang & Nikitina, 2023), academic boredom (Kruk et al., 2022), and moral distress of language educators (Thumvichit, 2023a). However, Q is rarely adopted in L2 research. This is despite the fact that this methodology is particularly suitable for exploring subjectivity and a host of feelings and emotions in L2 research (Thumvichit, 2022a).

As Brown (1986) stated, in Q methodology, subjectivity is approached as "the sum of behavioral activity that represents a person's current point of view" (p. 46). As such, subjectivity comprises opinions, beliefs, conceptions, assumptions, or any expression of personal or collectively shared importance (McKeown & Thomas, 2013). A comparative scarcity of L2 studies that employ Q might be due to a lack of awareness among researchers and practitioners of the availability of this methodology and the affordances it offers. Also, there is a lack of domain-specific guidelines and practices for implementing and conducting a Q study. However, in the past decade (i.e., 2013–2023) there has been an increasing interest among the L2 research community in Q methodology.

With a growing prominence of Q as a research methodology a number of scoping reviews has been published on studies in the academic fields of education, nursing education, and healthcare (e.g., Churruca et al., 2021; Hensel et al., 2022; Lundberg

et al., 2020). In the field of Second Language Acquisition (SLA) and L2 research, Li (2022) reviewed nine Q studies that focused on affective factors involved in learning a new language. This current article aims to give a wider scoping review of Q studies that explored subjectivity, and psychological aspects involved in learning and teaching a new language.

A scoping review has been described as a "reconnaissance" work with the aim "to summarise and disseminate research findings, to identify research gaps, and to make recommendations for future research" (Peters et al., 2015, p. 141). It can be an exercise for its own sake as well. In conducting this current scoping review, we were motivated to explore published L2 research that employed a relatively novel for the field Q methodology, to identify the main characteristics of these studies, to assess the methodological decisions made by the researchers and to examine the ways the analytical procedures were implemented and reported. We decided to limit this review to only the published papers because articles in reputable academic journals are subjected to peer-review and they set certain quality benchmarks for future studies. The research questions that guided this study are:

1. What is the geographical distribution of L2 studies that adopted the Q methodology?
2. What are the topics of interest in these studies?
3. Which analytical steps and procedures were adopted in the L2 Q methodology studies?

In order to answer these questions, we sought Q studies published in L2 journals between 2013 and 2023. This scoping review also seeks to draw some implications for the development of future L2 research employing the Q methodology.

Q METHODOLOGY: AN OVERVIEW

Q methodology (Q) is an approach to investigating individual people's viewpoints and inherent subjectivity on any topic, phenomenon or event (Stephenson, 1953). Epistemologically, Q "breaks the boundary between scientific and interpretive frameworks" (Goldman, 1999, p. 594). Acknowledging the hybrid character of Q methodology, Stenner and Stainton Rogers (2004) created the term "qualiquantology". To support this view, McKeown and Thomas noted that Q brings qualitative research into the quantitative realm (McKeown & Thomas, 2013, p. 1). With numerous methodological advantages and affordances that combining quantitative and qualitative research paradigms allows, Q is recognised as a mixed-methods approach to studying subjectively held viewpoints on a variety of topics and issues (Ramlo, 2020).

Data Collection in Q

Conducting a Q methodology study involves a unique data collection procedure, known as Q sorting, followed by a specific statistical analytic method that includes factor analysis (Brown, 1996; Stephenson, 1935a; 1935b; 1953). Several excellent guidelines are available on how to design and conduct a Q study (Brown, 1980; Damio, 2016; McKeown & Thomas, 2013; Stephenson, 1993; Watts, 2015; Watts & Stenner, 2012), including in L2 research (Irie, 2014; Y. Wang et al., 2022). Typically, a Q study proceeds in a sequence of steps: (1) compiling a concourse that represents a 'universe' of subjective opinions on topic at hand, (2) constructing the Q-set/Q-sample from the concourse, (3) selecting the participants (the P-set), (4) conducting the Q sorting among the participants and thus obtaining the completed Q sorts, (5) performing post-sorting interviews, (6) conducting factor analysis, and (7) interpreting factors (see Figure 1).

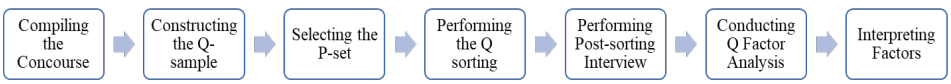

Figure 1. Methodological steps in a Q study. The figure shows the sequence of steps in implementing a Q study.

Concourse compilation, which is the initial step in Q, refers to amassing "a wide-ranging universe of statements for any situation or context" (Stephenson, 1986, p. 37). A study concourse can be derived from a variety of sources, such as scholarly literature on the topic of interest, the mass media and commentaries from the social media, official documents, self-report questionnaires, focus group discussions, and interviews with experts or potential participants (Brown, 1993; McKeown & Thomas, 2013). A subset of statements known as Q-sample, is then extracted from the concourse. Usually, the number of Q-sample statements ranges between 40 and 80. It is advisable to pilot the Q-sample among people who have their own opinions and interest in the topic of a study so that necessary modifications are done before the main study is conducted (Y. Wang et al., 2022; Watts & Stenner, 2012).

Upon finalising the Q-sample, the researcher needs to identify the 'right' participants (i.e., the P-set). As Brown (1980) noted, choosing the P-set should be "more theoretical or dimensional than random or accidental" (p. 192). For this reason, Q studies use purposive sampling, and the P-set size is usually small. The participants are then presented with the Q-sample and asked to perform Q sorting, which usually involves placing cards with printed Q-sample statements on a grid where the end points represent the opposing opinions (e.g., "strongly disagree" on one end and "strongly agree" on the other). Watts and Stenner (2012) advise using a fixed quasi-

normal distribution for the Q sorting procedure, as this layout represents "the most convenient and pragmatic means of facilitating the item ranking process" (p. 179). As a guideline, Brown (1980) suggested using a nine-point distribution (i.e., from –4 to +4) for a Q-sample of 40 items or less, an eleven-point distribution (from –5 to +5) for a Q-sample of 40 items–60 items, and a thirteen-point distribution (from –6 to +6) for a Q-sample of 60 items or above. An example of a 9-point Q sort grid is given in Figure 2. Alternatively, but less frequently, the cards can be placed in a free manner without any restrictions regarding their distribution.

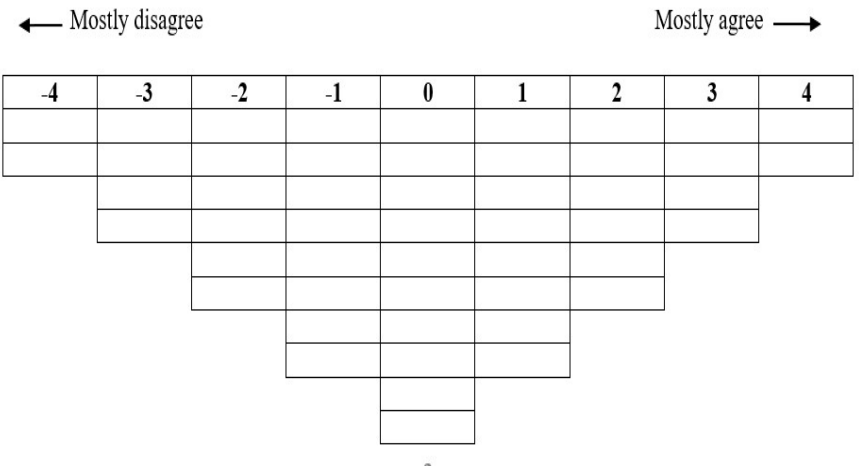

Figure 2. Example of a 9-point Q sort grid distribution. The figure shows a possible layout of a 9-point grid for sorting Q-sample statements.

The process of Q-sorting allows the participants to express – and the researcher to capture – their subjectivity, namely, their own views and opinions, agreements and disagreements with a range of statements on a given topic. In other words, the completed Q sorts that are later subjected to a set of statistical procedures reflect the participants' subjective viewpoints. To better understand the rationale behind these subjective opinions, researchers may want to conduct a post-sorting interview with the participants. This will yield qualitative data that can be analysed by an appropriate method, such as, for example, the card content analysis proposed by Gallagher and Porock (2010).

Data Analysis in Q

Data analysis in Q combines quantitative and qualitative approaches. The former includes obtaining the correlation matrix among the Q-sorts and performing the factor analysis, which consists of two steps, namely, factor extraction and factor rotation. Data

analysis in this phase is usually done with the aid of special software, such as PQMethod (Schmolck & Atkinson, 2014) or KADE (Banasick, 2019).

To give more details of the quantitative analysis in Q, the correlation matrix shows how the Q sorts correlate. This is a transitional phase between the raw data and the fully completed statistical procedure. Some valuable insights can be gained from examining the matrix. For example, highly correlated Q sorts indicate very similar opinions held by the participants. Following this initial step, the data are submitted to factor extraction, which aids in "reducing variable complexity to greater simplicity" (Kerlinger, 1979, p. 180). Two frequently used factor extraction methods in Q are centroid and principal component analysis (Brown, 1980; Watts & Stenner, 2012).

The extracted factors are then subjected to rotation, either judgemental (i.e., hand/manual rotation) or the one yielding a mathematical solution (i.e., varimax rotation) (Brown & Robyn, 2004). This step produces a more systematic and interpretable structure (Akhtar-Danesh, 2016). In this stage, the researcher must make several important methodological decisions where consideration is given to "the nature of the data and the aims of the investigator" (Brown, 1980, p. 238) as well as the researcher's epistemological position (Brown, 1980, 1993; Watts & Stenner, 2012). The factor analysis is done to determine the number of factors (i.e., the grouping of the participants' viewpoints), which are implicit in the correlation matrix (Brown, 1986). Hence, the factors in Q are the "categories of operant subjectivity" (Stephenson, 1978, cited in Brown, 1986, p. 60), representing the ways participants classify themselves.

Upon completing the factor analysis, the researcher proceeds to interpret the factors. As Watts and Stenner (2012) noted, the purpose of factor interpretation is to make sense of the identified and retained factors. In other words, the researcher attempts to deduce the meaning the factors convey. This process is often guided by the logic of abduction (Brown, 1980) and is complemented by the researcher's own hunches and his or her knowledge of the topic and specific research context (Y. Wang et al., 2022).

In the qualitative phase of a Q study, the data obtained from the post Q-sorting interviews aid and complement the factor interpretation. A sound outcome of the factor interpretation endeavour represents the participants' subjective viewpoints on the topic of interest.

Q Methodology L2 Research

In L2 research, Q methodology is a comparatively novel and rarely employed analytical approach. This is despite the fact that the first available Q study was done in 2001 by Lo Bianco. The researcher measured political actors' subjective viewpoints towards the officialisation of the English language. In recent years, situation has started to

change. A growing number of L2 and applied linguistics studies began adopting Q to inquire into a variety of issues, including language learners' motivations (Fraschini & Caruso, 2019; Zheng et al., 2019; 2020), language teachers' and learners' anxiety (Fraschini & Park, 2021; 2022), language teachers' motivational drivers (Lu & Geng, 2022), attitudes toward multilingualism (Lundberg, 2019a; 2019b), language policy (Vanbuel, 2022), boredom in the language classroom (Kruk et al., 2022), burnout and resilience of EFL teachers (Ding et al., 2023), moral distress among language teachers (Thumvichit, 2023a), classroom stressors (Thumvichit, 2023b), and English language learners' epistemic beliefs (Wang & Nikitina, 2023). The following section gives an account of the methodological decisions and analytical procedures in L2 studies that employed Q.

METHOD

This scoping review comprises academic journal articles published between 2013 and 2023. The reason to set the year 2013 as the initial point for article search and selection is that, except for Lo Bianco's (2001) study, no available L2 studies employed Q prior to that year. In other words, more than a decade passed before the Q methodology has attracted the wider attention of L2 researchers.

A well-executed scoping review needs to have a clear protocol. Several guidelines (e.g., Peters et al., 2015; Tricco et al., 2018) aided in setting the protocol and conducting this current review. As Peters et al. (2015) recommended, we considered choosing an appropriate title, elucidating the background of the review, setting the review questions and objectives, explaining the search and inclusion criteria, charting the findings, offering a discussion of the findings, and drawing implications for future research and practice.

Steps in the search of articles for inclusion in this scoping review were explained, and a graphical representation of the search process and decisions taken regarding the retrieval, selection, and removal of the articles is provided. A narrative description of this process is offered, as advised in the literature. An in-depth discussion of the scoping review findings, limitations of this review as well as conclusions and implications for future research and practice is provided.

Data Search Strategies

A search of three electronic databases, namely, Academic Search Complete, Scopus, and Web of Science, was done to identify and select appropriate studies for this scoping review. The following criteria were set for conducting the selection process: the studies must belong to a certain document type (i.e., articles published in academic

journals) and subject areas (i.e., L2 research, language learning, and language teaching). Appropriate search terms were identified. The data search strategies are presented in Table 1. We selected an 11-year time span ranging from January 2013 to December 2023 due to a lack of studies published prior to 2013.

Table 1. Data search strategies

Database searched	Academic Search Complete, Scopus, and Web of Science
Search terms	(Q method) OR (Q-method) OR (Q methodology) OR (Q-methodology) AND
	(language learning) OR (language teaching) OR (L2) OR (foreign language) OR (EFL)
Limiters	Date (2013–2023), Language (English)

As can be seen from Table 1, the search terms to guide the selection of studies were: (Q method) OR (Q-method) OR (Q methodology) OR (Q-methodology) AND (language learning) OR (language teaching) OR (L2) OR (foreign language) OR (EFL). Only English-language journal articles were considered.

Preparing a graphical representation of the selection process (see Figure 3) was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher et al., 2009; Page et al., 2021). Though we acknowledge the differences between a systematic and a scoping review, the PRISMA diagram offers excellent advice for graphically depicting the steps and stages in the selection process, besides allowing for appropriate modifications. For these reasons, it has been widely used by researchers conducting scoping reviews (e.g., Hensel et al., 2022). As shown in Figure 3, the search results (N = 321) from the three databases were all retained at the initial stage. Duplicate records were then removed. Following this, further filtration was done to remove non-relevant articles. For example, some of the retained articles' titles and abstracts only contained the terms 'language learning' or 'language teaching'; these articles were excluded. Also, books, book chapters, and dissertations were excluded, as our aim was to assess the characteristics and scope of published peer-reviewed journal articles.

To refine the remaining collection of studies, a manual check was done. At this stage, we removed duplicates and ensured that the retained studies fully comply with the inclusion criteria, namely:

1. Q studies that explored issues relating to subjectivity in language learning and language teaching.
2. Studies that provided specific and sufficient details of Q methodology application.

3. Studies that reported empirical results.
4. Studies published in peer-reviewed English-language journals.
5. Full-text of the article is available.

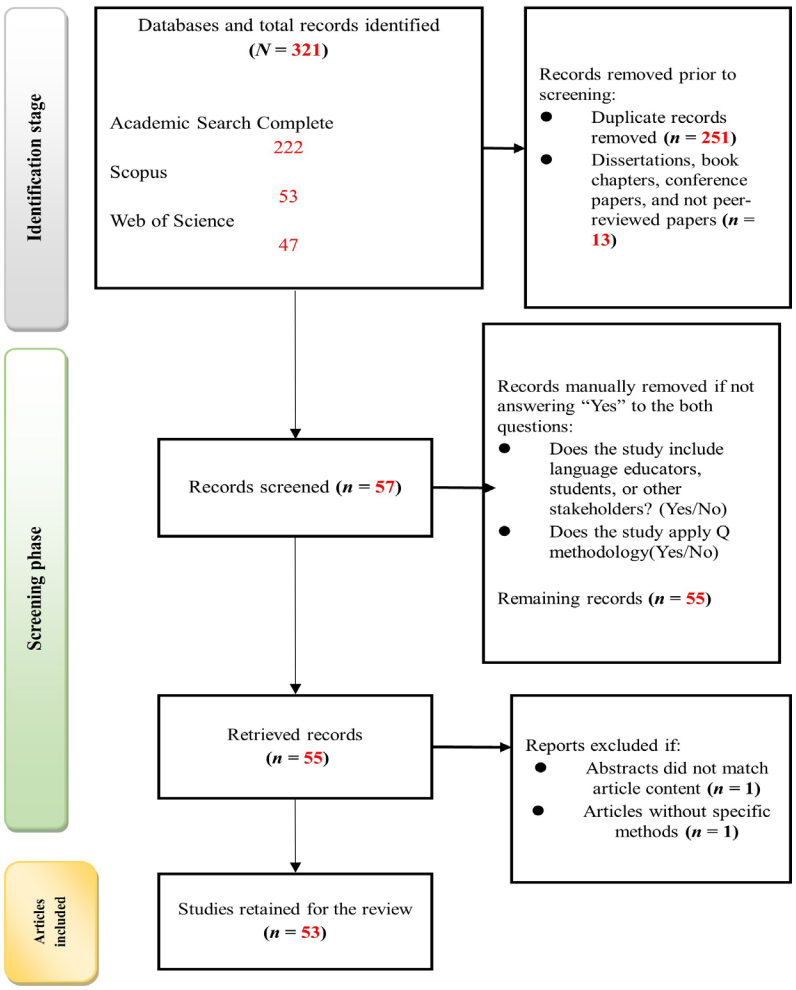

Figure 3. Flow chart of literature selection. The figure shows the sequence of steps in the search of databases and the decisions taken at each step. (Adapted from Hensel et al., 2022)

As the outcome of the search and selection process, 53 empirical studies were retained. Figure 4 presents the breakdown of the number of Q studies published per year.

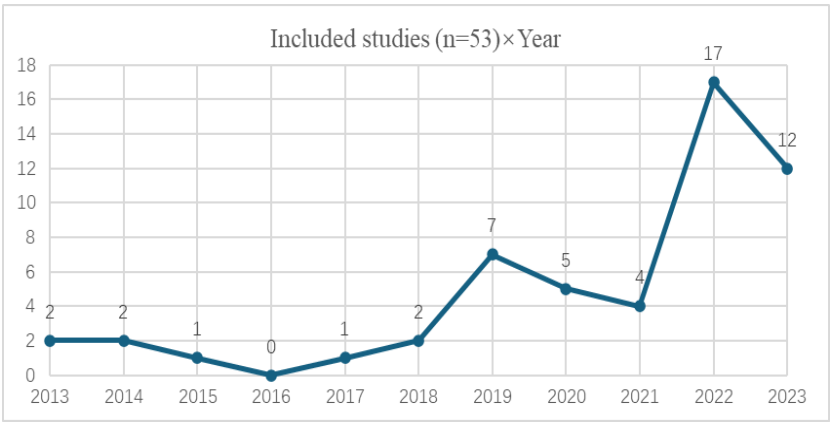

Figure 4. Number of Q studies published per year between 2013 and 2023. The figure shows the pattern and breakdown of the published L2 research employing the Q methodology.

As can be seen from Figure 4, the number of L2 Q methodology studies doubled from only 7 studies in 2021 to 14 studies in 2022. It remains to be seen whether this trend continues in 2023, as the data were collected in December 2023. Nevertheless, a rise can be observed in L2 researchers' interest in Q methodology. Furthermore, as methodological literature suggests, a codebook was created to keep track of and organise the data for analysis (Dziopa & Ahern, 2011; Pigott & Polanin, 2020). The 53 articles retained for the analysis were systematically coded as follows in order to answer the research questions raised in this study:

1. Topic of a Q study.
2. Research aim.
3. Data collection and analytical procedure (i.e., sources of concourse, Q-sample size, P-set size, piloting, software, factor extraction and factor rotation methods, and implementation of post Q-sorting interviews).
4. Empirical findings (i.e., number of factors).

A synthesis of the findings is presented in the following section.

FINDINGS

Characteristics of L2 Q Studies

Figure 5 shows the geographical distribution of Q studies, namely, the countries where these studies were done and the number of studies done in each country. The following narrative account gives details of the research topics and participants in L2 Q methodology studies.

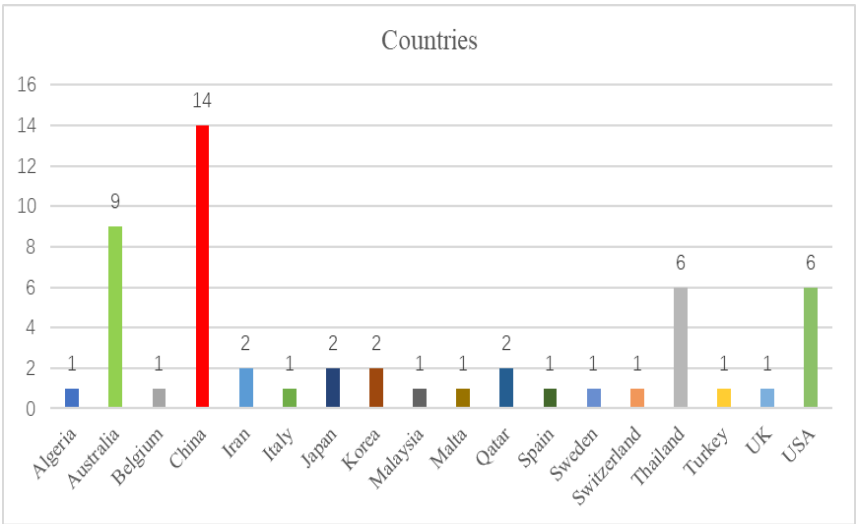

Figure 5. Geographical distribution of L2 Q methodology studies (2013–2023). The figure shows the geographical distribution of Q studies, and the number of studies published in each country.

As Figure 5 shows, the geographical coverage of the L2 Q methodology studies published in English is wide. It also reveals a lack of reports about Q studies done in Latin American and African educational contexts. Researchers in China have reported the largest number of Q studies (n = 14); this was followed by Australia (n = 9) and the US (n = 6). Other countries were Algeria (n = 1), Belgium (n = 1), Iran (n = 2), Italy (n = 1), Japan (n = 2), South Korea (n = 2), Malaysia (n = 1), Malta (n = 1), Qatar (n = 2), Spain (n = 1), Sweden (n = 1), Switzerland n = 1), Thailand (n = 6), Turkey (n = 1) and the UK (n = 1). The topics explored in these 53 studies can be classified into three broad areas or clusters:

1. L2 teachers' and students' viewpoints concerning a range of psychological factors (*n* = 29).

2. Beliefs and issues related to L2 teachers' professional practice (*n* = 19).

3. Perceptions about methods and approaches to L2 teaching (*n* = 5).

To be more specific, the 29 studies on psychological factors focused on the participants' subjectivities, including the self-vision of Italian L2 learners, self-vision of Korean language learners, students' perspectives on their future L2 self, language learners' emotional dynamics, students' motivation for learning Spanish as a foreign language, motivational profiles of Chinese university students, English as a foreign language learners' subjective perspectives regarding foreign language enjoyment in online learning, Chinese university students' motivation to learn multiple languages, and EFL learners' opinions regarding the triggers and mediating forces of directed motivational currents (Caruso & Fraschini, 2021; Chang & Zhou, 2023; Fraschini & Caruso, 2019; Fraschini, 2020; Fraschini, 2022; Lu et al., 2019; Peng & Wu, 2024; Thumvichit, 2022b; Zheng et al., 2019; 2020). Other topics concerned boredom in the L2 classroom, students' viewpoints regarding the interplay of the teacher's and the students' motivation, multilingual identity profiles and the evolution of Chinese high school LOTE-as-L3 learners, investment in learning Chinese by international students, language learners' vocabulary-related epistemological beliefs, English language learners' epistemic beliefs, high school teachers' and students' subjective attitudes toward mobile English learning apps, stakeholders' perspectives on educational language policy in higher education and the factors which influence and shape English as an additional language (EAL) education, graduates' perceptions of sustainability and educational language policy and stakeholders' viewpoints about language program (Alkhateeb et al., 2020; Alkhateeb & Bouherar, 2023; Jodaei et al., 2021; Kruk et al., 2022; J. Lu et al., 2022; Y. Lu & Xiong, 2023; Rock, 2013; Slaughter et al., 2019; 2022; Vanbuel, 2022; Wang & Nikitina, 2023; X. Wu & Forbes, 2022; 2023). Several studies in this cluster focused on language educators' psychological and emotional labours. They explored language teachers' experiences of burnout and professional resilience, L2 educators' shared experiences of the feeling of anxiety in their professional practice, undergraduate student-teachers' anxiety, viewpoints of university English language teachers regarding enjoyment in their career and professional context, and the potential sources of moral distress among Thai secondary-level EFL teachers and Thai tertiary-level EFL teachers' divergent viewpoints regarding classroom stressors (Ding et al., 2023; Fraschini & Park, 2021; 2022; Thumvichit, 2022c; Thumvichit, 2023a; 2023b).

The 19 studies that addressed L2 teachers' beliefs about a host of professional and practice-related issues explored the language educators' understanding of the importance of their students' mother tongue(s) in the process of learning an L2, teachers' beliefs about multilingualism, teachers' perceptions of the instructional design,

trainee teachers' conceptions of autonomy in language learning, lecturers' viewpoints on the challenges of English medium instruction, preservice teachers' civic education beliefs, pre-service EFL teachers' mindsets about their teaching competences, Korean language teachers' perspectives regarding the main competencies required of non-native teachers, the experiences of in-service trainee teachers, language teachers' pedagogical beliefs, teachers' viewpoints about multilingualism and educational reforms, educators' perspectives in relation to English as an additional language (EAL) provision, preschool teachers' perspectives on linguistic diversity, business English teachers' beliefs about online assessment, preservice teachers attitudes towards student diversity, English teachers' perceptions of English language education, teachers' beliefs about engagement strategies, and the application of learning management systems (Alkhateeb & Alshaboul, 2022; Camenzuli et al., 2022; Collins & Liang, 2014; Damio & Hashim, 2014; Deignan & Morton, 2022; Gailey & Knowles, 2022; Irie et al., 2018; Kentzer et al., 2019; Kim et al., 2023; X. Lu et al., 2020; Lundberg, 2019a; 2019b; Qi & Othman, 2023; Slaughter et al., 2022; Sung & Akhtar, 2017; Ünsal & Kasap, 2023; P. Wu & Y. Wang, 2021; Yang & Montgomery, 2013; Yuan & Bianco, 2022).

The five Q studies on the perceptions of teaching methods or teaching designs have explored L2 learners' views of a graduate TESOL methods class, students' perceptions of critical thinking in English language medium instruction (EMI) programs, students' opinions about the effect of imagery training on possible L2 selves, and students' challenges and coping strategies in English-medium instruction (Charoenpornsook & Thumvichit, 2023; Collins & Angelova, 2015; Cooke, 2020; Deignan & Morton, 2022; Gyenes, 2021).

In sum, the 53 Q methodology L2 studies have addressed a variety of issues. Notably, a range of novel topics pertaining to psychological factors have been explored by the researchers, including English language learners' epistemic beliefs, language educators' moral distress, teachers' burnout, and professional resilience. Table 2 shows the characteristics of the P-sets in these studies. Notably, not only L2 educators and language learners have shared their subjective opinions but also other important stakeholders, such as school principals, faculty administrators, and policymakers.

Table 2: Participants in Q studies (P-sets)

Language educators (n = 27)*	Language learners (n = 20)	Language teachers and students (n = 1)	Various stakeholders (n = 5)
Collective of teachers	University students	High school teachers and High school students	University's internal and external stakeholders, such as students, teachers, faculty administrators.
Trainee teachers	Middle school students		Adult English learners
Preservice teachers	High school students		University graduates
Preschool teachers			School principals
Student teachers			Stakeholders operating at different levels of the policy process in education
International school teachers			
Primary school teachers			
University teachers			
TESOL committee teachers			
Second language teachers			
EFL teachers			
Secondary-level EFL teachers			

Note: n indicates the number of Q studies

Figure 6 offers a graphical summary of the Q studies' characteristics, such as their P-set size (i.e., the number of participants) and the size of the Q-sample (i.e., the number of statements).

Though a Q study does not necessitate many participants (Watts & Stenner, 2012, p. 88), the P-sets across the studies ranged from 5 to 67 persons (M = 29.82, SD = 14.24) and the number of Q-sample statements ranged from 18 to 62 (M = 42.94, SD = 10.98) (see Figure 6). In most of the studies, the size of the P-set was smaller than the Q-sample (Alkhateeb & Alshaboul, 2022; Camenzuli et al., 2022; Collins & Liang, 2014; Deignan & Morton, 2022). In five studies (n = 5), the number of participants (P-set)

was very close to the number of the Q-sample statements (Fraschini, 2020; Fraschini & Park, 2022; Gailey & Knowles, 2022; Kruk et al., 2022; Yang & Montgomery, 2013). In these studies, the difference between the two values was less than or equal to 3; however, the P-sets were smaller than the Q-samples. There were only 11 studies where the P-set was larger (Alkhateeb et al., 2020; Alkhateeb & Bouherar, 2023; Charoenpornsook & Thumvichit, 2023; Gyenes, 2021; Lundberg, 2019a; 2019b; Qi & Othman, 2023; Rock, 2013; Thumvichit, 2023a; 2023b; Ünsal & Kasap, 2023). Having information about the P-set and the Q-sample size allowed us to assess the ratio of the P-set size to the Q-sample, which on average was 1.44. The largest P-set to Q-sample ratio was 1:8 (Slaughter et al., 2019). The following subsection presents the methodological decisions and variations in the L2 Q methodology studies.

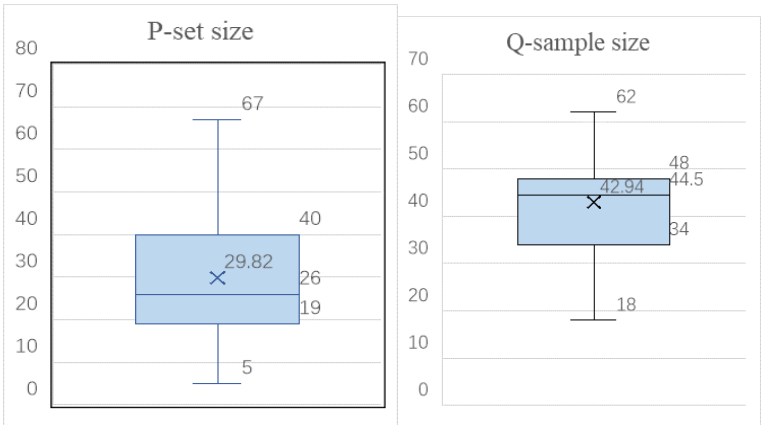

Figure 6. P-set size and Q-sample size in L2 Q studies. The left panel of the figure shows variations in the size of participants; the right panel shows variations in the number of Q-sample statements.

Note: A difference in the total number of the P-sets and Q-samples is due to the fact that some studies had two cohorts of participants and one Q-sample.

Main Features of L2 Q Studies

Fuller and more detailed information about the characteristics of Q studies in this scoping review (e.g., the size of the concourse, the choice of the software) is given in Appendix A. A narrative synthesis of these studies that follows addresses such key elements in the Q methodology as the size of the final Q-sample, the Q-sorting grid distribution, the method of factor extraction and factor rotation, and the number of factors extracted.

As our analysis indicates, all Q studies in this scoping review elucidated the sources from where their concourse items had been obtained (see Appendix). However, this was done either in greater detail or in broader terms. A concourse is typically drawn from a variety of sources, such as scholarly literature, interviews and discussions with focus groups, articles in the mass media, and social media discussions (McKeown & Thomas, 2013). Performing and reporting this initial step aligns well with the Q methodological guidance. Notably, only 19 out of 53 Q studies provided the total number of concourse items. Furthermore, less than half of the studies (n = 21) reported that they had piloted their Q-samples prior to the main study. In the remaining 32 studies, no such information was provided. Some of the studies only mentioned that consultations among the researchers were held during the process of Q-sample construction.

Next, all the studies stated the number of their Q-sample statements, which ranged from 18 to 62, and which aligns with the Q methodological literature where a desired Q-sample size is defined as having more than 20 but less than 100 items (Brown, 1980, 1986; Stephenson, 1953). It should be noted, however, that ultimately "the exact size of the final Q set will, to a great extent, be dictated by the subject matter itself" (Watts & Stenner, 2012, p. 61). The majority of the L2 studies had more than 30 items, and only seven studies (n = 7) reported a Q-sample smaller than 30 statements (Alkhateeb et al., 2020; Alkhateeb & Alshaboul, 2022; Alkhateeb & Bouherar, 2023; Gailey & Knowles, 2022; Qi & Othman, 2023; Thumvichit, 2023a; Ünsal & Kasap, 2023).

Regarding the Q-sorting procedure, the range of the Q grid distribution varied from a 7-point (–3/+3) to a 13-point (–6/+6) scale. The most employed (n = 33) was an 11-point (–5/+5) scale; in these studies, the Q samples ranged from 29 to 60. Eleven studies (n = 11) reported adopting a 9-point (–4/+4) distribution with Q samples ranging from 27 to 45; four studies (n = 4) employed a 13-point scale (–6/+6) with Q samples larger than 60; and five studies (n = 5) used a 7-point (–3/+3) scale with Q samples of 18/34, 20, 23, 30, and 48, respectively. Overall, these methodological decisions align with Brown's advice (1980) that a 9-point distribution (–4 to +4) be used for a Q-sample of 40 items or less, an 11-point distribution (–5 to +5) for 40–60 items, and a 13-point distribution (–6 to +6) for 60 and above items (p. 200).

As to the availability of information about the post Q-sorting interviews, most studies (n = 48) reported performing the interviews with their participants. In several studies, the interviews were conducted online due to the restrictions caused by the COVID-19 pandemic in 2020-2022 (e.g., Cooke, 2020; Fraschini & Park, 2021; Thumvichit, 2022a; 2022b). Essentially, as advised in methodological literature (e.g., Watts & Stenner, 2012), having post Q-sorting interviews is highly desirable, as this allows enriching the data and aids the factor interpretation process.

Regarding the software programs used in the Q studies, the PQMethod software (Schmolck & Atkinson, 2014) was the preferred analytical tool (n = 25), while the KADE software (Banasick, 2019) was used less often (n = 22). One study (n = 1) (Damio & Hashim, 2014) did not state the software adopted by the researchers. Four studies (n = 4) employed a combination of software, and only one study (n = 1) used STATA. It should be noted that several other software packages for Q research are available, including PCQUANL, Q-Assessor and QMethod. However, these programs were not used in L2 research.

As to the methods of factor extraction and factor rotation in the 53 Q studies, twenty-one studies (n = 21) adopted the centroid method of factor extraction and nineteen (n = 19) performed the Principal Component Analysis (PCA). Thirteen studies (n = 13) did not disclose the method of factor extraction and only stated that the completed Q sorts had been subjected to the factor extraction procedure. As to the factor rotation, most studies that provided such information employed the varimax method (n = 38). Manual or judgemental rotation was done only in two studies (n = 2). Four studies (n = 4) performed a combination of the varimax rotation and manual adjustment. Seven studies (n = 7) did not report the factor rotation technique. Two studies (n = 2) with two sets of Q sorts to analyse adopted different methods of factor extraction and rotation. Specifically, Y. Lu and Xiong (2023) first used the PCA method with the varimax rotation and proceeded to employ the PCA method and manual factor rotation. Lundberg (2019a) performed the PCA and varimax rotation to analyse the data collected from the first Q-sorting activity, while the centroid method and varimax rotation were used to analyse the second set of Q-sorts. Overall, the findings regarding the analytical procedure in the Q studies are in line with the recommendations given in the methodological literature (Brown, 1993; Watts & Stenner, 2012).

All studies included in this scoping review (n = 53) stated the number of factors extracted and retained for further interpretation. In the majority of studies, the number of factors extracted ranged from 2 to 5, with a 6-factor study being an outlier (M = 3.06, SD = 0.83). The variation of 3 to 4 factors was typical. To give more details, fourteen studies (n = 14) identified four factors, and twenty-three studies (n = 23) retained three factors. Five studies (n = 5) extracted two factors. In the remaining 11 studies, there were two, three, four, five, or six extracted factors. As stated earlier, some studies implemented the Q-sorting procedure twice or even three times (e.g., Zheng et al., 2019; 2020; X. Wu & Forbes, 2022; 2023) and subsequently produced two or three sets of factors in one study. Overall, these findings are in line with the number of factors extracted in Q studies in a wide variety of academic disciplines, which were usually two, three, or four factors (Watts & Stenner, 2012). The majority of the L2 studies that employed Q methodology labelled and explained the identified factors. In rare instances, some factors were omitted from the explanation of the findings (e.g., Cooke, 2020; Damio & Hashim, 2014), which was done due to space constraints. Some L2 studies reviewed

in this article adopted less conventional Q methodology research designs. These innovative research endeavours are reviewed in greater detail in the next subsection.

Less Conventional Q Study Designs

Factors reported and interpreted in most of the L2 Q methodology studies reviewed here stemmed from one Q-sample sorted by one P-set at one point in time. Several studies depart from this design. For example, in 11 of the 53 reviewed articles, the factor solutions came from multiple scholarly investigations that involved more than one P-set or more than one Q-sample (Camenzuli et al., 2022; Cooke, 2020; Y. Lu & Xiong, 2023; Lundberg, 2019a; 2019b; Peng & Wu, 2024; Qi & Othman, 2023; X. Wu & Forbes, 2022, 2023; Zheng et al., 2019, 2020). When reporting the methodological data in this scoping review, we considered each and every instance of the Q-sorting activity. Accordingly, the number of factors stemming from each Q-sorting activity was reported.

To be more specific, in four (n = 4) of the studies, two cohorts of participants were instructed to sort the same Q-sample statements. For example, to explore the attitudes of high school students and teachers towards mobile apps, Y. Lu and Xiong (2023) recruited two groups of participants. One group comprised 13 students, and the other consisted of 14 teachers. The participants Q-sorted 30 statements. Three factors were identified in the students' data, and two factors transpired from the teachers' Q sorts. In Peng and Wu's (2024) comparative study of the motivational profiles of Chinese university students majoring in Spanish, two groups of learners were included. Spanish major freshmen formed Group A (27 students), and sophomores were placed in Group B (20 students). The participants Q-sorted the same set of 47 statements on two consecutive days. Three factors defined the motivational profiles of the learners in Group A, and two factors were retained for the data from Group B.

In another study, X. Wu and Forbes (2022) were interested in examining and comparing the multilingual identity of Chinese high school students from two different educational contexts. They recruited two groups of students learning a language-other-than-English (LOTE). One group consisted of students from an international school (n = 35) and the other group was made up of public-school students (n = 22). The participants were instructed to sort 62 statements. Three factors emerged from the international school students' data, and two factors were retained for the group of public-school students. Subsequently, X. Wu and Forbes' (2023) longitudinal study tracked the evolution of the multilingual identity of Chinese high school students. The same set of 62 statements was distributed on several occasions to three cohorts of participants consisting of 22, 18, and 19 students, respectively. Two factors for each group emerged after the factor analysis, which revealed the students' divergent viewpoints toward their multilingual identities.

In four Q studies (n = 4), different conditions of instruction were implemented with the same group of participants and two sets of Q-samples. In one such study, Camenzuli et al. (2022) designed two Q-samples with different numbers of statements to explore the participants' understanding of multilingualism and assess their views on pedagogical practices concerning multilingualism. The participants, 21 teachers, performed two separate Q-sorting activities. Three factors were identified in the first component of the study, and three factors emerged in the second phase. Lundberg (2019a) employed two Q-samples to explore teachers' beliefs about multilingualism. Forty teachers in a Swedish primary school sorted a 39-item Q-sample on understanding multilingualism, and another 32-item Q-sample on pedagogy. In the following study, Lundberg (2019b) assessed 67 primary school teachers' viewpoints about multilingualism in the German-speaking part of Switzerland. Two Q-samples, one containing 39 items on the understanding component and another comprising 32 items on the pedagogy component, were presented to the participants. Two factors for component one and six factors for component two were identified and interpreted. More recently, Qi and Othman (2023) recruited 38 Chinese tertiary EFL teachers to explore their beliefs about and practices pertaining to the application of learning management systems. The participants performed two subsequent Q-sorting activities using two different Q sets: one contained 34 statements regarding the teachers' beliefs, and the other consisted of 18 statements on the teachers' practice. After data analysis, four belief factors and three practice-related factors were identified.

In another innovative study, Zheng et al. (2019) explored Chinese university students' motivation to learn multiple languages; they recruited two groups of L3 Spanish language learners. A Q-sample of 60 items was given to 20 students in Group A; a different Q-sample with 47 statements was presented to 17 students in Group B. Two factors representing the motivational profiles of the two groups were revealed. In the following year, Zheng et al. (2020) tracked the evolution of Chinese students' multilingual motivation in a longitudinal study that involved 15 participants and three rounds of data collection. The researchers identified two factors in the first and second Q-sorting activities, while three factors transpired in the data collected in the third round of the study.

Cooke (2020) adopted an experimental (i.e., pre- and post-intervention) research design to explore language learners' perceptions of the effect of imagery training on the development of their possible L2 selves. The data were collected from a control and an experimental group, both consisting of 23 students. For each group, two Q-sorting activities were conducted: pre-intervention and post-intervention. In the pre-intervention phase, four factors emerged from the control group, and five factors were identified for the experimental group. The post-intervention analysis revealed four factors in the control group data, and five factors were identified for the experimental group.

To sum up, despite a comparatively small number of L2 Q methodology studies published in English, L2 researchers are offering innovative approaches to implementing Q methodology. This reflects the increasing complexity of issues relating to subjectivity in the process of learning and teaching an additional language and the widening range of questions posed by L2 researchers.

DISCUSSION AND IMPLICATIONS

Empirical L2 research that employs Q methodology is still in a nascent stage. In total, 53 studies were published between 2013 and 2023. These studies have explored language learners' and language educators' subjectively held viewpoints, assumptions, beliefs, and opinions on a variety of issues that have either personal or social importance. They also examined the psychological aspects involved in learning and teaching a new language. All these studies have contributed to a deeper understanding of subjectivity as well as the affective, cognitive, and psychological processes involved in learning a new language. The foci of the L2 Q methodology studies range from traditional topics of L2 motivation (X. Lu et al., 2019; Peng & Wu, 2024) and multilingualism (Lundberg, 2019a; 2019b) to relatively novel issues of boredom in the L2 classroom (Kruk et al., 2022), classroom stressors (Thumvichit, 2023b), teacher burnout (Ding et al., 2023), teaching competency (Kim et al., 2023), and moral distress (Thumvichit, 2023a). Several studies addressed important language policy issues (Alkhateeb & Bouherar, 2023; Slaughter et al., 2019; Vanbuel, 2022).

Besides giving valuable insights into language learners' and language educators' beliefs and opinions, in addition to important pedagogical and policy implications, L2 researchers have contributed to the advancement of Q as a research methodology. Several studies adopted innovative and complex research designs, including the use of more than one Q-sample (Lundberg, 2019 a; 2019b) and more than one P-set (Zheng et al., 2019); some studies executed a longitudinal (Zheng et al., 2020) and an experimental research design (Cooke, 2020) that are still rare in Q. Other methodological implications to be drawn from this scoping review can be summarised as follows. Firstly, with only 53 Q studies published in scholarly English-language journals, further efforts are needed to popularise this unique methodology. These include conducting a greater number of Q studies and publishing their findings in international journals so that they are accessible to a wider international audience. Organising special seminars and workshops for researchers and students will enhance the visibility and availability of Q as a research methodology. Secondly, the quality of published Q research must be maintained at the highest level. Researchers sharing the findings of their Q studies need to give appropriate and sufficient details of the key methodological steps and decisions. These include information about the stages in the concourse development, its sources, and the number of items. This information can be provided as a supplementary file if the word number restrictions do not permit including these details in the main text.

Furthermore, information on whether a pilot study was conducted is important, as this enhances the validity of a Q study. Sufficient details need to be given about the method of factor extraction, the approach to factor rotation, and the rationale for these methodological choices. Also, the fact that reporting these aspects was omitted from some studies highlights the need to select article reviewers who are familiar with Q methodology and its key requirements.

Lastly, there is a clear preference among L2 researchers for a mathematical approach to factor solutions. For example, only two studies stated that they had employed hand (i.e., judgemental) rotation (Collins & Angelova, 2015; Sung & Akhtar, 2017); the other four studies used hand adjustment for factor solution (Jodaei et al., 2021; Kruk et al., 2022; P. Wu & Y. Wang, 2023; X. Wu & Forbes, 2022). In view of this, to fully celebrate the affordance for explorations and discoveries that Q methodology enables, future Q studies might more often employ judgemental or hand rotation following the centroid method of factor analysis. Such a choice is rooted in the logical inference of abduction, which, as Brown (1980) noted, "begins with effects and pursues potential causes (plausibilities)" (p. 237) and which the Q methodology uniquely accommodates, if not promotes. The judgemental (i.e., deliberate) rotation will aid new discoveries by bringing "unexpected but not unsuspected results to light" (Stephenson, 1961, p. 10, as cited in Brown, 1980, p. 237).

Unavoidably, this scoping review has some limitations. For example, it is possible that some L2 Q methodology studies were inadvertently omitted from this analysis. Particularly, those studies that did not include the specific terms of interest, namely, 'Q methodology/Q method', 'language learning', and 'language teaching', in either the title or the abstract. Despite some shortcomings, this article has highlighted the availability of Q methodology for L2 research on subjectivity and demonstrated the growing application of Q in language learning and language teaching research. Future Q methodological studies might investigate a wider range of L2 learners' and their teachers' subjective perspectives and experiences, including L2 learning needs and wants, opinions about integrating the latest technologies and AI in language instruction, and issues regarding the students' apparent disengagement in the classroom proceedings or in-class silence. It could be particularly insightful to compare different demographic groups and learning contexts. Furthermore, it could be desirable to implement longitudinal studies, as this will allow for a dynamic perspective on the ebbs and flows in subjective views. It is much hoped that this scoping review has contributed to popularising Q and germinating future methodological innovations in L2 research.

REFERENCES

Akhtar-Danesh, N. (2016). An overview of the statistical techniques in Q methodology: Is there a better way of doing Q analysis. *Operant Subjectivity, 38*(3–4), 29–36. https://doi.org/10.22488/okstate.17.100553

Alkhateeb, H., Al Hamad, M., & Mustafawi, E. (2020). Revealing stakeholders' perspectives on educational language policy in higher education through Q-methodology. *Current Issues in Language Planning, 21*(4), 415–433. https://doi.org/10.1080/14664208.2020.1741237

Alkhateeb, H., & Alshaboul, Y. (2022). Teachers' understanding of the importance of students' mother tongue(s) in Qatar's international English-medium primary schools: findings from Q method research. *Current Issues in Language Planning, 23*(1), 37–56. https://doi.org/10.1080/14664208.2021.1925456

Alkhateeb, H., & Bouherar, S. (2023). Sustainability and educational language policy in Arab higher education: findings from Q research. *Current Issues in Language Planning, 24*(5), 573–595. https://doi.org/10.1080/14664208.2022.2155925

Banasick, S, (2019). KADE: A desktop application for Q methodology. *Journal of Open Source Software, 4*(36), 1360. https://doi.org/10.21105/joss.01360

Barcelos, A. M. F., & Kalaja, P. (2011). Introduction to beliefs about SLA revisited. *System, 39*(3), 281–289. https://doi.org/10.1016/j.system.2011.07.001

Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science.* New Haven, CT: Yale University Press.

Brown, S.R. (1986). Q technique and method: Principles and procedures. In W. D. Berry, & M. S. Lewis-Beck (Eds.), *New tools for social scientists* (pp. 57–76). Beverly Hills, CA: Sage.

Brown, S. R. (1993). A primer on Q methodology. *Operant Subjectivity, 16*(3/4), 91–138. https://doi.org/10.22488/okstate.93.100504

Brown, S. R. (1996). Q methodology and qualitative research. *Qualitative Health Research, 6*(4), 561–567. https://doi.org/10.1177/104973239600600408

Brown, S. R., & Robyn, R. (2004). Reserving a key place for reality: Philosophical foundations of theoretical rotation. *Operant Subjectivity, 27*(3), 104–124. https://doi.org/10.22488/okstate.04.100523

Camenzuli, R., Lundberg, A., & Gauci, P. (2022). Collective teachers' beliefs about multilingualism in Maltese primary education. *International Journal of Bilingual Education and Bilingualism, 26*(4), 379–454. https://doi.org/10.1080/13670050.2022.2114787

Caruso, M., & Fraschini, N. (2021). A Q methodology study into vision of Italian L2 university students: An Australian perspective. *The Modern Language Journal, 105*(2), 552–568. https://doi.org/10.1111/modl.12713

Chang, P., & Zhou, L. (2023). Pinpointing the pivotal mediating forces of directed motivational currents (DMCs): Evidence from the Q methodology. *System, 117*, 103095. https://doi.org/10.1016/j.system.2023.103095

Charoenpornsook, V., & Thumvichit, A. (2023). Engineering students' challenges and coping strategies in English-medium instruction: A Q methodology study. *ResearchSquare preprint.* https://doi.org/10.21203/rs.3.rs-3376598/v1

Churruca, K., Ludlow, K., Wu, W., Gibbons, K., Nguyen, H. M., Ellis, L. A., & Braithwaite, J. (2021). A scoping review of Q-methodology in healthcare research. *BMC Medical Research Methodology, 21*(1), 125. https://doi.org/10.1186/s12874-021-01309-7

Collins, L., & Angelova, M. (2015). What helps TESOL methods students learn: Using Q methodology to investigate students' views of a graduate TESOL methods class. *International Journal of Teaching and Learning in Higher Education, 27*(2), 247–260.

Collins, L. J., & Liang, X. (2014). Task relevance in the design of online professional development for teachers of ELLs: AQ methodology study. *Turkish Online Journal of Distance Education, 15*(3), 268–281.

Cooke, S. (2020). Using Q methodology to examine the effect of imagery training on possible second language selves among basic English users. *Konińskie Studia Językowe, 8*(2), 121–141.

Damio, S. M. (2016). Q Methodology: An overview and steps to implementation. *Asian Journal of University Education, 12*(1), 105.

Damio, S. M., & Hashim, H. (2014). Conceptions of autonomy in language learning from a cultural perspectives using Q methodology. *IIUM Journal of Educational Studies, 2*(1), 33–45. https://doi.org/10.31436/ijes.v2i1.27

Deignan, T., & Morton, T. (2022). The challenges of English medium instruction for subject lecturers: a shared viewpoint. *ELT Journal, 76*(2), 208–217. https://doi.org/10.1093/elt/ccab084

Ding, X., Liu, Y., & Peng, J. E. (2023). Straddling burnout and resilience: a Q methodology study among high school EFL teachers. *Journal of Multilingual and Multicultural Development*, ahead-of-print. https://doi.org/10.1080/01434632.2023.2193171

Dziopa, F., & Ahern, K. (2011). A systematic literature review of the applications of Q-technique and its methodology. *Methodology, 7*(2), 45–55. https://doi.org/10.1027/1614-2241/a000021

Fraschini, N. (2020). 'Because Korean is cool' adolescent learners' vision, motivation, and the study of the Korean language. *Journal of Korean Language Education, 31*(English edition), 37–74.

Fraschini, N. (2022). Language learners' emotional dynamics: Insights from a Q methodology intensive single-case study. *Language, Culture and Curriculum, 36*(2), 222–239. https://doi.org/10.1080/07908318.2022.2133137

Fraschini, N., & Caruso, M. (2019). "I can see myself…": A Q methodology study on self vision of Korean language learners. *System, 87*, 102147. https://doi.org/10.1016/j.system.2019.102147

Fraschini, N., & Park, H. (2021). Anxiety in language teachers: Exploring the variety of perceptions with Q methodology. *Foreign Language Annals, 54*(2), 341–364. https://doi.org/10.1111/flan.12527

Fraschini, N., & Park, H. (2022). A Q methodology study to explore Korean as a second language undergraduate student-teachers' anxiety. *International Journal of Educational Research Open, 3*, 100145. https://doi.org/10.1016/j.ijedro.2022.100145

Gailey, S. M., & Knowles, R. T. (2022). Exploring preservice teachers' civic education beliefs with Q methodology. *Teaching Education, 33*(4), 470–490. https://doi.org/10.1080/10476210.2021.1979511

Gallagher, K., & Porock, D. (2010). The use of interviews in Q methodology: Card content analysis. *Nursing Research, 59*(4), 295–300. https://doi.org/10.1097/NNR.0b013e3181e4fffff

Goldman, I. (1999). Q methodology as process and context in interpretivism, communication, and psychoanalytic psychotherapy research. *The Psychological Record, 49*, 589–604. https://doi.org/10.1007/BF03395329

Gyenes, A. (2021). Student perceptions of critical thinking in EMI programs at Japanese universities: A Q-methodology study. *Journal of English for Academic Purposes, 54*, 101053. https://doi.org/10.1016/j.jeap.2021.101053

Hensel, D., Toronto, C., Lawless, J., & Burgess, J. (2022). A scoping review of Q methodology nursing education studies. *Nurse Education Today, 109*, 105220. https://doi.org/10.1016/j.nedt.2021.105220

Irie, K. (2014). Q methodology for post-social-turn research in SLA. *Studies in Second Language Learning and Teaching, 4*(1), 13–45. https://doi.org/10.14746/ssllt.2014.4.1.2

Irie, K., Ryan, S., & Mercer, S. (2018). Using Q methodology to investigate pre-service EFL teachers' mindsets about teaching competences. *Studies in Second Language Learning and Teaching, 8*(3), 575–598. https://doi.org/10.14746/ssllt.2018.8.3.3

Jodaei, H., Zareian, G., Amirian, S. M. R., & Adel, S. M. R. (2021). The interplay of teacher motivation and learner motivation: A Q method study. *Current Psychology, 40*, 1696–1710. https://doi.org/10.1007/s12144-018-0091-5

Kentzer, N., Bracey, P., & Devecchi, C. (2019). Using activity theory and Q methodology to examine the experiences of in-service trainee teachers in the English further education sector. *Research in Post-Compulsory Education, 24*(4), 439–461. https://doi.org/10.1080/13596748.2019.1654711

Kerlinger, F. N. (1979). Behavioral research a conceptual approach. Harcourt College Publishers.

Kim, S. E., Fraschini, N., & Park, H. (2023). Defining competencies for training non-native Korean speaking teachers: A Q methodology approach. *International Review of Applied Linguistics in Language Teaching,* ahead-of-print. https://doi.org/10.1515/iral-2023-0200

Kruk, M., Pawlak, M., Shirvan, M. E., Taherian, T., & Yazdanmehr, E. (2022). Potential sources of foreign language learning boredom: A Q methodology study. *Studies in Second Language Learning and Teaching, 12*(1), 37–58. https://doi.org/10.14746/ssllt.2022.12.1.3

Li, X. (2022). The significance of Q-methodology as an innovative method for the investigation of affective variables in second language acquisition. *Frontiers in Psychology, 13*, 995660. https://doi.org/10.3389/fpsyg.2022.995660

Lo Bianco, J. (2001). *Officialising language: A discourse study of language politics in the United States* [doctoral dissertation, The Australian National University].

Lu, J., Wang, Y., Shen, Q., & Gao, X. (2022). Investment in learning Chinese by international students studying Chinese as a Second Language (CSL). *Sustainability, 14*(23), 15664. https://doi.org/10.3390/su142315664

Lu, X., & Geng, Z. (2022). Faith or path? Profiling the motivations of multilingual Chinese as a foreign language teachers using Q methodology. *Language Teaching Research, 29*(3), 1345–1371. https://doi.org/10.1177/13621688221099079

Lu, X., Zheng, Y., & Ren, W. (2019). Motivation for learning Spanish as a foreign language: The case of Chinese L1 speakers at university level. *Círculo de Lingüística Aplicada a la Comunicación, 79*, 79. https://doi.org/10.5209/clac.65649

Lu, X., Zou, X., & Tao, J. (2020). Spanish language teachers' pedagogical beliefs in Chinese universities. *Círculo de Lingüística Aplicada a la Comunicación, 84*, 41–53. https://doi.org/10.5209/clac.71994

Lu, Y., & Xiong, T. (2023). The attitudes of high school students and teachers toward mobile apps for learning English: A Q methodology study. *Social Sciences & Humanities Open, 8*(1), 100555. https://doi.org/10.1016/j.ssaho.2023.100555

Lundberg, A. (2019a). Teachers' beliefs about multilingualism: findings from Q method research. *Current Issues in Language Planning, 20*(3), 266–283. https://doi.org/10.1080/14664208.2018.1495373

Lundberg, A. (2019b). Teachers' viewpoints about an educational reform concerning multilingualism in German-speaking Switzerland. *Learning and Instruction, 64*, 101244. https://doi.org/10.1016/j.learninstruc.2019.101244

Lundberg, A., de Leeuw, R., & Aliani, R. (2020). Using Q methodology: Sorting out subjectivity in educational research. *Educational Research Review, 31*, 100361. https://doi.org/10.1016/j.edurev.2020.100361

McKeown, B. F., & Thomas, D. B. (2013). *Q methodology* (2nd ed.). Los Angeles, CA: Sage. https://doi.org/10.4135/9781483384412

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Medicine, 6*(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *International Journal of Surgery, 88*, 105906. https://doi.org/10.1016/j.ijsu.2021.105906

Peng, J. E., & Wu, L. (2024). Motivational profiles of Chinese university students majoring in Spanish: a comparative study. *Journal of Multilingual and Multicultural Development, 45*(6), 1938–1955. https://doi.org/10.1080/01434632.2022.2035740

Peters, M. D., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews. *JBI Evidence Implementation, 13*(3), 141–146. https://doi.org/10.1097/XEB.0000000000000050

Pigott, T. D., & Polanin, J. R. (2020). Methodological guidance paper: High-quality meta-analysis in a systematic review. *Review of Educational Research, 90*(1), 24–46. https://doi.org/10.3102/0034654319877153

Qi, Y., & Othman, R. (2023). Investigating Chinese tertiary EFL teachers' beliefs and practices in the application of learning management systems using Q Methodology. *Arab World English Journal, 14*(4), 111–130. https://doi.org/10.24093/awej/vol14no4.7

Ramlo, S. E. (2020). Divergent viewpoints about the statistical stage of a mixed method: Qualitative versus quantitative orientations. *International Journal of Research & Method in Education, 43*(1), 93–111.

Rock, J. (2013). Exploring vocabulary-related epistemological beliefs with Q-methodology. *L'analisi Linguistica E Letteraria, 21*(2), 137–154.

Schmolck, P., & Atkinson, J. (2014). PQMethod (version 2.35). http://schmolck.org/qmethod/

Slaughter, Y., Bonar, G., & Keary, A. (2022). The role of membership viewpoints in shaping language teacher associations: A Q methodology analysis. *TESOL Quarterly, 56*(1), 281–307. https://doi.org/10.1002/tesq.3068

Slaughter, Y., Lo Bianco, J., Aliani, R., Cross, R., & Hajek, J. (2019). Language programming in rural and regional Victoria: Making space for local viewpoints in policy development. *Australian Review of Applied Linguistics, 45*(3), 274–300. https://doi.org/10.1075/aral.18030.sla

Stenner, P., & Stainton Rogers, R. (2004). Q methodology and qualiquantology: The example of discriminating between emotions. In Z. Todd, B. Nerlich, S. McKeown, & D. D. Clarke (Eds.), *Mixing methods in psychology: The integration of qualitative and quantitative methods in theory and practice* (pp. 101–120). Psychology Press.

Stephenson, W. (1935a). Technique of factor analysis. *Nature, 136*(3434), 297. https://doi.org/10.1038/136297b0

Stephenson, W. (1935b). Correlating persons instead of tests. *Character and Personality, 4*, 17–24. https://doi.org/10.1111/j.1467-6494.1935.tb02022.x

Stephenson, W. (1953). *The study of behavior: Q-technique and its methodology.* Chicago: University of Chicago Press.

Stephenson, W. (1978). Concourse theory of communication. Communication, 3, 21–40.

Stephenson, W. (1986). Protoconcursus: The concourse theory of communication. *Operant Subjectivity, 9*(2), 37–58. https://doi.org/10.22488/okstate.86.100574

Stephenson, W. (1993). Introduction to Q-methodology. *Operant Subjectivity, 17*(1/2), 1–13. https://doi.org/10.22488/okstate.93.100509

Sung, P., & Akhtar, N. (2017). Exploring preschool teachers' perspectives on linguistic diversity: A Q study. *Teaching and Teacher Education, 65*, 157–170. https://doi.org/10.1016/j.tate.2017.03.004

Thumvichit, A. (2022a). Illuminating insights into subjectivity: Q as a methodology in applied linguistics research. *Applied Linguistics Review*, ahead-of-print. https://doi.org/10.1515/applirev-2021-0205

Thumvichit, A. (2022b). Unfolding the subjectivity of foreign language enjoyment in online classes: AQ methodology study. *Journal of Multilingual and Multicultural Development*, ahead-of print. https://doi.org/10.1080/01434632.2022.2050917

Thumvichit, A. (2022c). Enjoyment in language teaching: A study into EFL teachers' subjectivities. *International Review of Applied Linguistics in Language Teaching*, ahead-of-print. https://doi.org/10.1515/iral-2022-0087

Thumvichit, A. (2023a). 'I'm aware of that, but…': Breaking the silence on moral distress among language teachers. *Language, Culture and Curriculum, 36*(3), 343–360. https://doi.org/10.1080/07908318.2023.2189268

Thumvichit, A. (2023b). Understanding emotion-regulation among foreign language teachers in response to classroom stressors: Findings from a Q methodology study. *Social Psychology of Education, 26*, 1593–1620. https://doi.org/10.1007/s11218-023-09809-8

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., ... & Straus, S.E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine, 169*(7), 467–473. https://doi.org/10.7326/M18-0850

Ünsal, F., & Kasap, S. (2023). Investigating English teachers› perceptions of English language education through the Q Method. S*hanlax International Journal of Education, 11*(4), 15–24. https://doi.org/10.34293/education.v11i4.6297

Vanbuel, M. (2022). How stakeholders see the implementation of language education policy: A Q-study. *Current Issues in Language Planning, 23*(1), 57–76. https://doi.org/10.1080/14664208.2021.1928427

Wang, Y., & Nikitina, L. (2023). A Q Study of Mainland Chinese English language learners' epistemic beliefs. *REFLections, 30*(1), 84–103. https://doi.org/10.61508/refl.v30i1.264850

Wang, Y., Nikitina, L., Kaur, J., & Furuoka, F. (2022). Developing and piloting a Q-sample on Chinese language learners' epistemic beliefs. *Journal of Language and Education, 8*(3), 119–132.

Watts, S. (2015). Develop a Q methodological study. *Education for Primary Care, 26*(6), 435–437. https://doi.org/10.1080/14739879.2015.1101855

Watts, S., & Stenner, P. (2012). *Doing Q methodological research: Theory, method and interpretation.* London, England: Sage. https://doi.org/10.4135/9781446251911

Wu, P., & Wang, Y. (2021). Investigating business English teachers' belief about online assessment: Q methodology conducted during COVID-19 period. *The Asia-Pacific Education Researcher, 30*, 621–630. https://doi.org/10.1007/s40299-021-00604-7

Wu, X., & Forbes, K. (2022). Multilingual identity in schools: A Q methodological study with Chinese LOTE-as-L3 learners in international and public high school contexts. *Journal of Language, Identity & Education*, ahead-of-print. https://doi.org/10.1080/15348458.2022.2134138

Wu, X., & Forbes, K. (2023). Contextualising the temporal dimension in multilingual identity construction: A longitudinal Q methodological study with Chinese LOTE-learning public high school students. *System, 116*, 103090. https://doi.org/10.1016/j.system.2023.103090

Yang, Y., & Montgomery, D. (2013). Gaps or bridges in multicultural teacher education: A Q study of attitudes toward student diversity. *Teaching and Teacher Education, 30*, 27–37. https://doi.org/10.1016/j.tate.2012.10.003

Yuan, C., & Bianco, J. L. (2022). L2 Chinese teachers' beliefs about engagement strategies for students in Australia: Findings from Q methodology research. *System, 106*, 102792. https://doi.org/10.1016/j.system.2022.102792

Zheng, Y., Lu, X., & Ren, W. (2019). Profiling Chinese university students' motivation to learn multiple languages. *Journal of Multilingual and Multicultural Development, 40*(7), 590–604. https://doi.org/10.1080/01434632.2019.1571074

Zheng, Y., Lu, X., & Ren, W. (2020). Tracking the evolution of Chinese learners' multilingual motivation through a longitudinal Q methodology. *The Modern Language Journal, 104*(4), 781–803. https://doi.org/10.1111/modl.12672

APPENDIX

The 53 studies included in the scoping review on L2 Q methodology research (2013–2023)

Authors	Concourse*	Pilot study	Q-sample/P-set	O-sorting Grid	Interview	Software	Factor extraction/ Factor rotation	Number of factors extracted
Alkhateeb et al. (2020)	Source: Yes 47 items	Yes	23 items/65 participants	7-point quasi-normal	Yes	PQMethod	Centroid/varimax rotation	4 factors
Alkhateeb & Alshaboul (2022)	Source: Yes 43 items	Yes	27 items/16 participants	9-point quasi-normal	Yes	PQMethod	Centroid/varimax rotation	3 factors
Alkhateeb & Bouherar (2023)	Source: Yes 121 items	Yes	29 items/30 participants	11-point quasi-normal	No	PQMethod	Centroid/varimax rotation	4 factors
Camenzuli et al. (2022)	Source: Yes --	Yes	41 items/21 participants; 34 items/21 participants	9-point quasi-normal	Yes	KADE	Centroid/varimax rotation	3 factors; 3 factors
Caruso & Fraschini (2021)	Source: Yes --	No	45 items/34 participants	11-point quasi-normal	Yes	KADE	PCA/varimax rotation	3 factors
Charoenpornsook, & Thumvichit (2023)	Source: Yes --	No	40 items/47 participants	11-point quasi-normal	Yes	KADE	Centroid/varimax rotation	3 factors
Chang & Zhou (2023)	Source: Yes 60 items	No	47 items/15 participants	11-point quasi-normal	Yes	KADE	Centroid/varimax rotation	3 factors
Collins et al. (2014)	Source: No 97 items	No	36 items/13 participants	11-point quasi-normal	Yes	PQMethod	PCA/varimax rotation	2 factors
Collins & Angelova (2015)	Source: Yes 45 items	No	35 items/19 participants	11-point quasi-normal	Yes	PQMethod	Centroid/manual rotation	3 factors
Cooke (2020)	Source: Yes --	No	50 items/23 participants; 50 items/23 participants;	11-point quasi-normal	Yes	PQMethod /KADE	No extraction/ varimax rotation	4 factors; 5 factors
Damio et al. (2014)	Source: Yes --	No	40 items/31 participants	11-point quasi-normal	Yes	No	No	4 factors
Deignan & Morton (2022)	Source: Yes --	Yes	48 items/24 participants	7-point quasi-normal	Yes	KADE	PCA/varimax rotation	3 factors

Authors	Concourse*	Pilot study	Q-sample/P-set	O-sorting Grid	Interview	Software	Factor extraction/ Factor rotation	Number of factors extracted
Ding et al. (2023)	Source: Yes --	Yes	47 items/40 participants	11-point quasi-normal	Yes	PQMethod	Centroid/varimax rotation	3 factors
Fraschini et al. (2019)	Source: Yes --	No	45 items/39 participants	11-point quasi-normal	No	PQMethod	Centroid/varimax rotation	4 factors
Fraschini (2020)	Source: Yes --	Yes	47 items/44 participants	11-point quasi-normal	Yes	KADE	PCA/varimax rotation	3 factors
Fraschini & Park (2021)	Source: Yes --	Yes	47 items/45 participants	11-point quasi-normal	Yes	KADE	PCA/varimax rotation	3 factors
Fraschini & Park (2022)	Source: Yes 102 items	No	47 items/37 participants	11-point quasi-normal	Yes	KADE	PCA/varimax rotation	4 factors
Fraschini (2022)	Source: Yes --	Yes	30 items/5 participants	9-point quasi-normal	Yes	KADE	Centroid/varimax rotation	3 factors
Gailey & Knowles (2022)	Source: Yes --	No	27 items/24 participants	9-point quasi-normal	No	STATA 15	No	4 factors
Gyenes (2021)	Source: Yes --	No	32 items/39 participants	9-point quasi-normal	No	KADE	PCA/varimax rotation	4 factors
Irie et al. (2018)	Source: Yes 140 items	Yes	56 items/51 participants	11-point quasi-normal	Yes	PQMethod	No	3 factors
Jodaei et al. (2021)	Source: Yes 450 items	No	60 items/60 participants	11-point quasi-normal	Yes	PQMethod	No extraction/ varimax rotation and hand adjustment	4 factors
Kentzer et al. (2019)	Source: Yes 199 items	Yes	48 items/11 participants	11-point quasi-normal	Yes	PQMethod	No extraction/ varimax rotation	2 factors
Kim et al. (2023)	Source: Yes --	No	42 items/ 35 participants	11-point quasi-normal	Yes	KADE	PCA/varimax rotation	4 factors
Kruk et al. (2022)	Source: Yes 87 items	Yes	40 items /37 participants	9-point quasi-normal	Yes	PQMethod	No extraction/ varimax rotation and hand adjustment	3 factors
Lu et al. (2019)	Source: Yes --	No	47 items/17 participants	11-point quasi-normal	Yes	PQMethod	Centroid/varimax rotation	2 factors
Lu et al. (2020)	Source: Yes --	Yes	40 items/20 participants	11-point quasi-normal	Yes	PQMethod	Centroid/varimax rotation	3 factors
Lu & Geng (2022)	Source: Yes --	No	40 items/23 participants	11-point quasi-normal	Yes	PQMethod	No extraction/ varimax rotation	4 factors

Authors	Concourse*	Pilot study	Q-sample/P-set	O-sorting Grid	Interview	Software	Factor extraction/ Factor rotation	Number of factors extracted
Lu et al. (2022)	Source: Yes 57 items	No	30 items/15 participants	7-point quasi-normal	Yes	PQMethod	No	3 factors
Lu & Xiong (2023)	Source: Yes 73 items	No	30 items/30 participants; 30 items/14 participants	9-point quasi-normal	Yes	PQMethod / KADE	PCA/varimax rotation; PCA/ manual rotation	3 factors; 2 factors
Lundberg (2019a)	Source: Yes --	Yes	39 items/40 participants; 32 items/40 participants	9-point quasi-normal	Yes	PQMethod	PCA/varimax rotation Centroid/varimax rotation	3 factors; 3 factors
Lundberg (2019b)	Source: Yes --	Yes	32 items/67 participants; 39 items/67 participants	9-point quasi-normal	Yes	PQMethod	PCA/varimax rotation	2 factors; 6 factors
Peng & Wu (2024)	Source: Yes --	Yes	47 items/27 participants; 47 items/20 participants	11-point quasi-normal	Yes	PQMethod	Centroid/varimax rotation	3 factors; 2 factors
Qi & Othman (2023)	Source: Yes --	No	34 items/38 participants; 18 items/38 participants	7-point quasi-normal	Yes	PQMethod /KADE	PCA/varimax rotation	4 factors; 3 factors
Rock (2013)	Source: Yes --	Yes	36 items/40 participants	11-point quasi-normal	No	PQMethod	No extraction/ varimax rotation	2 factors
Slaughter et al. (2019)	Source: Yes --	Yes	48 items/6 participants	11-point quasi-normal	Yes	PQMethod	No	3 factors
Slaughter et al. (2022)	Source: Yes --	No	37 items/11 participants	11-point quasi-normal	Yes	KADE	PCA/varimax rotation	3 factors
Sung & Akhtar (2017)	Source: Yes --	No	34 items/21 participants	9-point quasi-normal	Yes	PQMethod	Centroid/hand rotation	4 factors
Thumvichit (2022a)	Source: Yes --	No	44 items/40 participants	11-point quasi-normal	Yes	KADE	Centroid/varimax rotation	3 factors
Thumvichit (2022b)	Source: Yes --	No	47 items/41 participants	11-point quasi-normal	Yes	KADE	PCA/varimax rotation	3 factors
Thumvichit (2022c)	Source: Yes --	No	47 items/41 participants	11-point quasi-normal	Yes	KADE	PCA/varimax rotation	3 factors
Thumvichit (2023b)	Source: Yes --	Yes	40 items/44 participants	11-point quasi-normal	Yes	KADE	Centroid/No	3 factors
Thumvichit (2023a)	Source: Yes 44 items	No	29 items/33 participants	9-point quasi-normal	Yes	KADE	Centroid/varimax rotation	3 factors

Authors	Concourse*	Pilot study	Q-sample/P-set	O-sorting Grid	Interview	Software	Factor extraction/ Factor rotation	Number of factors extracted
Ünsal & Kasap (2023)	Source: Yes --	No	20 items/35 participants	7-point quasi-normal	Yes	PQMethod	PCA/no mention	3 factors
Vanbuel (2022)	Source: Yes About 150 items	No	52 items/43 participants	11-point quasi-normal	Yes	KADE	No extraction/ varimax rotation	4 factors
Wang & Nikitina (2023)	Source: Yes 385 items	Yes	42 items/20 participants	11-point quasi-normal	Yes	KADE	Centroid extraction/varimax rotation	3 factors
Wu & Wang (2021)	Source: Yes --	No	48 items/22 participants	11-point quasi-normal	Yes	PQMethod /KADE	No extraction/ varimax rotation and hand adjustment	4 factors
Wu & Forbes (2022)	Source: Yes --	Yes	62 items/35 participants; 62 items/22 participants	13-point quasi-normal	Yes	KADE	Centroid/varimax rotation and hand adjustment	3 factors; 2 factors
Wu & Forbes (2023)	Source: Yes --	No	62 items/22 participants; 62 items/18 participants; 62 items/19 participants	13-point quasi-normal	Yes	KADE	Centroid/varimax rotation	2 factors; 2 factors; 2 factors
Yang & Montgomery (2013)	Source: Yes --	No	47 items/43 participants	11-point quasi-normal	Yes	PQMethod	PCA/varimax rotation	2 factors
Yuan & Bianco (2022)	Source: Yes 286 items	No	48 items/25 participants	11-point quasi-normal	Yes	KADE	PCA/varimax rotation	4 factors
Zheng et al. (2019)	Source: Yes More than 100 items	No	60 items/20 participants; 47 items/17 participants	13-point quasi-normal	Yes	PQMethod	PCA/varimax rotation	2 factors; 2 factors
Zheng et al. (2020)	Source: Yes More than 100 items	No	60 items/5 participants; 60 items/5 participants; 60 items/5 participants	13-point quasi-normal	Yes	PQMethod	Centroid/varimax rotation	2 factors; 2 factors; 3 factors

**Note:* -- indicates that no number of concourse items was stated.