

## Review Article

# A Qualitative Evidence Synthesis Review of Longitudinal Qualitative Research in Gerontology

Andrea L. Nevedal, PhD,<sup>1,\*</sup> Liat Ayalon, PhD,<sup>2,•</sup> and Sherylyn H. Briller, PhD,<sup>3</sup>

<sup>1</sup>Center for Innovation to Implementation, VA Palo Alto Health Care System, Menlo Park, California. <sup>2</sup>Louis and Gabi Weisfeld School of Social Work, Faculty of Social Sciences, Bar-Ilan University, Ramat-Gan, Israel. <sup>3</sup>Department of Anthropology, Purdue University, West Lafayette, Indiana.

\*Address correspondence to: Andrea L. Nevedal, PhD, Center for Innovation to Implementation, VA Palo Alto Health Care System, 795 Willow Road (152-MPD), Building 324, Menlo Park, CA 94025. E-mail: [alnevedal@gmail.com](mailto:alnevedal@gmail.com)

Received: April 13, 2018; Editorial Decision Date: September 17, 2018

**Decision Editor:** Patricia C. Heyn, PhD

## Abstract

**Background and Objectives:** Gerontologists have long been interested in longitudinal qualitative research (LQR), yet ambiguity remains about best practices. The purpose of this review was to conduct a qualitative evidence synthesis to identify strengths and limitations in existing gerontological LQR.

**Research Design and Methods:** We searched for studies published in English before September 2017, using longitudinal qualitative methods and focusing on gerontology. We searched the following databases: PubMed and ProQuest. This was followed up by a snowball search to identify additional LQR articles that were not gerontologically focused but provided conceptual or methodological information to enhance gerontological LQR. Article titles and abstracts were reviewed, and selected articles were independently evaluated by all authors and summarized in a descriptive matrix based on design, analysis, and strengths and limitations.

**Results:** Our literature search resulted in 225 articles, which was then narrowed to 71 articles from 47 different journals based on our inclusion/exclusion criteria. LQR in gerontology varies considerably by study design and analysis approach. LQR design considerations involve number of time points and duration; rapport and retention; and consistent or different sampling, data collection, and measures. LQR analysis considerations involve synchronic and diachronic approaches, consistent or evolving coding, and individual- or group-level analysis. Gerontological LQR articles vary in the extent to which they address special aging considerations.

**Discussion and Implications:** This review indicates that there are areas where gerontological LQR can be strengthened going forward. We provide researchers with strategies to improve LQR rigor in our field and beyond.

**Keywords:** Life course, Literature review, Longitudinal methods, Qualitative methods

## Background and Objectives

Longitudinal qualitative research (LQR) involves the collection of two or more time points and the use of qualitative methods to capture and enhance understandings of time perspective and/or change over time. Gerontologists use LQR for studying aging and life course issues (Lynch & Danelly, 2013; Neale, 2015), physical and existential

changes (Ågren, 1998), long-term care (Ayalon, 2016, 2018; Kemp, Ball, & Perkins, 2015), and death and dying (Nissim, Gagliese, & Rodin, 2009) to name a few important areas. LQR's advantages stem from being able to take a more flexible and less restrictive approach to studying time and change. LQR explores processes and changes by looking backward and forward in time (Calman, Brunton, &

Molassiotis, 2013; Neale & Flowerdew, 2003, Torregrosa, Ramis, Pallarés, Azócar, & Selva, 2015). Additionally, LQR provides opportunities to evaluate interactions between time and context in a nonlinear manner and to more closely scrutinize how participants perceive these interactions. LQR can enable participants to experience emotional distance, while reflexively viewing past and present events and changing aspirations for the future. Given these benefits, both qualitatively and non-qualitatively trained gerontologists are increasingly using LQR to study meaning-making in old age, aging processes, life course issues, how perceptions change over time, and other topics related to contemporary gerontology. Thus, it is timely to evaluate existing gerontological LQR to determine best practices and ways to advance qualitative research rigor and reporting (Schoenberg & McAuley, 2007; Schoenberg, Miller, & Pruchno, 2011). This exploration will enable us to better consider the implications of LQR for gerontological scholarship, practice, and policy.

Corden and Millar's (2007a, 2007b) work on social policy LQR highlights how a purposive LQR literature review for a specific field is fruitful. We believe evaluating LQR approaches for gerontology has the potential to increase LQR usage in the field. Nonlinear approaches are needed in the understanding of social phenomena at different life course moments and across the life span—as well as for addressing life course concerns faced by older people.

The purpose of this review article was to provide a qualitative evidence synthesis of the strengths and limitations of the existing literature on LQR in the field of gerontology. We highlight LQR's diversity and richness and discuss challenges inherent in advancing LQR in the absence of a gold standard. We detail the limitations and strengths of how LQR is being used today to help researchers make informed decisions.

## Research Design and Methods

We conducted a qualitative evidence synthesis because it is a tool for comparing, integrating, evaluating, and identifying gaps in qualitative research (Grant & Booth, 2009; Tong, Flemming, McInnes, Oliver, & Craig, 2012). Our review was informed by the *Enhancing transparency in reporting the synthesis of qualitative research* (ENTREQ statement) and is conceptually closest to a metastudy because we sought to evaluate the rigor and epistemological soundness of LQR literature in gerontology (Tong et al., 2012). Supplementary Appendix 1 provides additional information about how we used the ENTREQ checklist to enhance our review.

## Article Selection

We examined peer-reviewed articles in PubMed and ProQuest, published before September 2017, using search terms longitudinal AND qualitative AND aging OR

gerontology OR older adults and restricting terms to the title/abstract to generate a list of references (see Supplementary Appendix 2 for full search strategy). The PRISMA flow diagram provides a visual overview of our process (Figure 1). We also searched *The Gerontologist* for the terms longitudinal AND qualitative and restricted search terms to the title/abstract. To initially determine inclusion and exclusion criteria, all three authors independently screened the title and abstract of each article. Following that, there was a consensus-based discussion to determine that the criteria were applied in the same way. Articles were included if they were written in English and had LQR and aging as the core component of the article, which involved (a) description of the study as LQR and aging related, and (b) collection of two or more qualitative data time points. We excluded articles in which LQR was briefly mentioned (e.g., only in the introduction or title) but did not describe LQR in the data collection, analysis, and results. Chart reviews and open-ended surveys were also excluded. Finally, to enhance our review, we used a snowball search to identify additional LQR articles that provided conceptual or methodological information to enhance gerontological LQR. To give one example, this search included a special issue on LQR that was published in the *International Journal of Social Research Methodology*.

## Full Text Evaluation

Each included article was summarized in a Microsoft Excel matrix (Averill, 2002) using deductive domains to describe reference characteristics (i.e., title, author, journal, and publication date) and study characteristics (i.e., design, analysis, and strengths/limitations). Subdomains for each of the study characteristics were identified inductively.

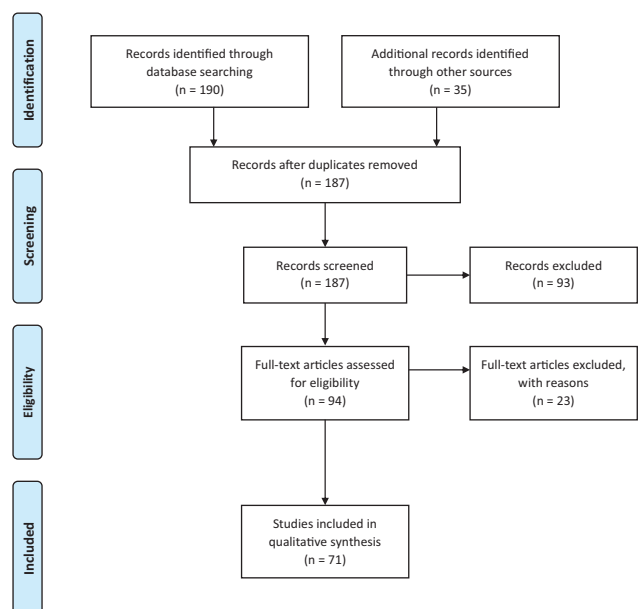


Figure 1. PRISMA 2009 flow diagram

For example, after reading the design section, we used an inductive approach to develop subdomains that were grounded in the descriptions provided in the article and to document the various LQR design considerations. Some of the inductive subdomains to describe LQR design considerations include time points/duration, retention/rapport, and consistent/evolving sampling. After the matrix domains were developed from a preliminary review of 10 articles, all three authors were involved in the final review of included papers. At least two authors independently reviewed each article and then flagged articles in which there were issues meriting the discussion about the approach or in which we perceived information to be incomplete. Thus, our process was rigorous and systematic because we used a matrix to compare and contrast articles and was iterative because we used a blended coding process (Gough, Thomas, & Oliver, 2012; Grant & Booth, 2009; Martinson & Berridge, 2015; Tong et al., 2012).

## Results

Our literature search resulted in 225 articles, which was then narrowed to 71 articles from 47 different journals based on our inclusion/exclusion criteria (see Figure 1 for PRISMA flow diagram and Supplementary Appendix 3 for the list of included journals). The 71 articles included in this review are referenced and described in Supplementary Appendix 4. In the following sections, we synthesize important design and analysis considerations when using LQR in gerontological research (see Table 1 for summary).

## Design Considerations

### Time points and duration

LQR consisted of a wide range of time points that were collected and analyzed (see Supplementary Appendix 4 for references based on time points), which often involved two, three, but also four or more time points. We found that the duration for which data are collected has important implications for LQR design and analyses and should match examined phenomena. When researchers expected change to be slow and staggering, they typically spaced their interviews over several years (Henderson, Holland, McGrellis, Sharpe, & Thomson, 2012; Murray, Akoum, & Storeng, 2012; Tomanović, 2003; Weller, 2012). In contrast, other researchers used condensed LQR, which involved data collection over a shorter period, such as 1 week (Robinson, Gott, Gardiner, & Ingleton, 2015) or weekly or monthly intervals (Benoot, Deschepper, Grypdonck, Saelaert, & Bilsen, 2015; Calman et al., 2013; Doran, 2014; Hansen, Rosenkranz, Vaccaro, & Chang, 2015; Tallman, Greenwald, Reidenouer, & Pantel, 2012; Webster et al., 2015). Other LQR studies used follow-ups over a much longer period, such as several years to a decade (Manthorpe & Samsi,

2016; Smith, 2003; Torregrosa et al., 2015; Watson, Irwin, & Michalske, 1991; Yates, 2003).

### Rapport and retention

Some LQR studies described how such details as time between data collection waves and interviewer consistency impacted participant rapport and retention, which were important for LQR's success (Mein et al., 2012; Watson et al., 1991). Data collected in a shorter time frame may promote rapport-building; the interviewee remembers the study and its purpose in subsequent waves. Yet, frequent contact may also overburden interviewees and might fail to detect changes. For example, when collecting data over longer time frames, some studies described using participant retention strategies such as checking in for updated contact information (Carduff, Murray, & Kendall, 2015; Porter & Lanes, 2000). These techniques were especially important when including older, fragile populations such as those in extremely poor health because there was a substantial risk for lost-to-follow-up due to incapacitating sickness and mortality (Pond, Stephens, & Alpass, 2010).

Planning for consistent or different interviewers was another important LQR consideration because researchers thought it affected the quality of the data collected. There were studies that described using the same interviewer for all research phases (Benoot et al., 2015; Doran, 2014; Murray et al., 2012; Tomanović, 2003) as a means of establishing rapport with participants; however, other studies described using different interviewers due to changes in study personnel over time (Ayalon & Greed, 2016) or to encourage participants to provide more thorough responses to questions (Manthorpe & Samsi, 2016). However, most studies did not report if interviewers were the same for each participant throughout the study or whether new interviewers were added to account for the changing nature of long-term studies and staff turnover.

### Consistent or evolving sampling

The literature we reviewed described how LQR research poses sampling and retention challenges. LQR sampling typically involved interviewing the same people in different waves (consistent with most reviewed studies); however, challenges arose when participants were lost-to-follow-up, deceased, or dropped out of the study (Benoot et al., 2015; Calman et al., 2013; Doran, 2014; Manthorpe, Samsi, & Rapaport, 2014; Mein et al., 2012; Smith, 2003; Tomanović, 2003; Watson et al., 1991). To address sampling problems in LQR, some researchers expanded sampling in future waves by including new primary participants (Watson et al., 1991) or included participants who provided additional insight on primary participants (Murray et al., 2012). This approach is known as participant triangulation (i.e., using different populations to obtain a more refined perspective on the topic) (Flick, 1992).

**Table 1.** A Summary of Longitudinal Qualitative Research (LQR) in Gerontology

Longitudinal qualitative research	Design considerations	Analysis considerations	Strengths of approach	Limitations of approach
<ul style="list-style-type: none"> <li>• Two or more data time points are collected and analyzed</li> </ul>	<ul style="list-style-type: none"> <li>• Number of time points</li> <li>• Duration between time points</li> <li>• Consistent or different interviewers</li> <li>• Consistent sample or evolving sample by adding new or different types of participants</li> <li>• Participant triangulation</li> <li>• Consistent or different data collection methods</li> <li>• Consistent or different qualitative measures</li> <li>• Questions to elicit time and/or change or general comparison of questions</li> <li>• Data triangulation</li> </ul>	<p><i>Synchronic analysis</i></p> <ul style="list-style-type: none"> <li>• Focused or rapid analysis during data collection or after each wave of data collection</li> <li>• Can stand alone or later combined with other waves of data</li> <li>• Individual- or group-level summary</li> </ul>	<p><i>Synchronic analysis</i></p> <ul style="list-style-type: none"> <li>• A systematic approach to dealing with large amounts of qualitative data</li> <li>• Each wave of data collection can be analyzed throughout the study to promote comparative analysis</li> <li>• Rapid qualitative analysis is an innovative use of within wave data collection</li> <li>• Refine follow-up waves of data collection tools/measures and analysis plans</li> </ul>	<p><i>Synchronic analysis</i></p> <ul style="list-style-type: none"> <li>• Does not account for entire data set</li> <li>• May not be able to describe change or time perspective</li> </ul>
		<p><i>Diachronic analysis</i></p> <ul style="list-style-type: none"> <li>• After all data are collected and involve comparing data points</li> <li>• Comparison of same questions or domains</li> <li>• Consistent or changing coding or analysis plan</li> <li>• Compare waves of data, compare persons/cases, compare domains/topics</li> <li>• LQR matrix for systematic comparison</li> </ul> <p><i>General analysis</i></p> <ul style="list-style-type: none"> <li>• Consistent or evolving codes</li> <li>• Individual- and/or group-level analysis and results</li> </ul>	<p><i>Diachronic analysis</i></p> <ul style="list-style-type: none"> <li>• Allows researcher to understand a more holistic or long-term view of research topic</li> <li>• Compare different time points to assess change or time perspective</li> </ul>	<p><i>Diachronic analysis</i></p> <ul style="list-style-type: none"> <li>• Analysis at the end of study misses opportunities to refine measures</li> <li>• Difficult to analyze multiple qualitative time points (time-intensive, complex)</li> <li>• Lost-to-follow-up or deceased participants may result in missing data</li> </ul> <p><i>General limitations</i></p> <ul style="list-style-type: none"> <li>• Resource intensive (staff, money, participant reimbursement, participants)</li> <li>• No guidelines about when data analysis should begin/end or how many time points</li> </ul>

One well-detailed example that included new primary participants in LQR involved a study about the long-term experiences of participating in a methadone maintenance program (Watson et al., 1991). The authors sampled 143 respondents at baseline, to ensure participant representation through five follow-up interviews spread over 4 years. Given the transient lifestyle of many initial study participants, they expanded their study by including new primary participants in subsequent waves and also requested addresses of family members or friends as a backup method for locating participants over time.

### Consistent or different data collection types

Another LQR consideration described in the literature was determining if data collection should be consistent or different throughout the study. We found most LQR studies used the same data collection methods (primarily individual interviews) throughout all time points (Benoot et al., 2015; Henderson et al., 2012; Murray et al., 2012; Plumridge & Thomson, 2003). However, some studies used multiple qualitative methods for data collection, such as participant observation, in-person/telephone interviews, home visits, diary entries, or photography/video at varying time points and for different purposes (Doran, 2014; Mendez-Luck, Amorim, & Anthony, 2016; Moore, Frost, & Britten, 2015; Peek et al., 2017; Richardson, Grime, & Ong, 2014; Tallman et al., 2012; Tomanović, 2003; Weller, 2012). For instance, Doran's (2014) chronic back pain study provides a detailed example of using participant observation of an 8-week course on how to use mindfulness to manage chronic pain with 6- and 12-month follow-up interviews.

### Consistent or different qualitative measures

In the LQR articles reviewed, some researchers described consistently using the same qualitative measures, whereas others used different qualitative measures across waves or a combination of both. Overall, we found that few LQR studies provided their interview guides, example questions, and/or reported modifications to their interview questions over time. A consistent approach to LQR measures involved asking the same questions or covering the same core domains throughout all data phases. Consequently, responses to consistent questions or domains were compared and contrasted over time. This approach enhanced what was known about a topic through multiple data collections over time. Fewer studies reported using the same questions/domains (Benoot et al., 2015; Doran, 2014; Manthorpe & Samsi, 2016; Smith, 2003). The continuing care retirement community (CCRC) studies (Ayalon, 2016, 2018) used a consistent domain approach because they compared discussions of the nursing unit in the first interview wave with brief follow-up discussions about the nursing unit in subsequent waves.

In contrast, more studies described adding or changing interviewing questions based on information gathered and/or analyzed in previous interview waves (Benoot et al.,

2015; Henderson et al., 2012; Smith, 2003; Webster et al., 2015; Weller, 2012). A simultaneous and iterative approach allowed prior data to guide further collection and is often perceived as a desirable technique in qualitative research. For example, Ayalon (2016, 2018) assessed respondents' attitudes toward a nursing unit in a CCRC; participants were explicitly asked about the nursing unit only in follow-up waves. Changing the interview guide was fueled by the first wave's preliminary analysis. Spontaneous reports or lack thereof were compared with reports tailored in response to specific nursing unit questions (Ayalon, 2016, 2018). This decision resulted in different types of information across waves. This approach provided information about a topic the researchers would not have addressed otherwise, as it was almost exclusively missing during spontaneous interviews. However, this approach introduced another form of change, namely the interview guide, which could affect the interview in multiple ways.

Among those who provided interview questions, there were different approaches to interview style/type overall. Of special interest for LQR, they had different ways of going about addressing time and change issues specifically (Hermanowicz, 2013). Some LQR used specific prompts to encourage participants to discuss time or change in terms of what has occurred (e.g., past experiences or interviews), what is currently occurring (e.g., present), or what may occur (e.g., future goals, expectations, or concerns) (Calman et al., 2013; Torregrosa et al., 2015).

Others using LQR provided summaries to remind participants of key topics from previous interviews and/or asked participants to reflect on what was described during previous interviews (Calman et al., 2013; Mizrahi, 2007; Peek et al., 2017). Such an approach allowed for member checking (Koelsch, 2015) by asking participants to clarify certain responses. This approach also encouraged and guided further discussions of a selected topic along with opportunities to assess change or elapsed time. In researching cancer patients' symptoms, Calman et al. (2013) described benefits of conducting preliminary analysis and creating summaries after each data wave. This strategy allowed the interviewer to probe for important themes from previous interviews. It allowed participants to discuss current status and potential changes occurring since previous time points. In gerontological LQR, reflexivity was seen as important, especially for older adults, who may go through physical, cognitive, and social changes as they age.

## Analysis Considerations

### Synchronic or diachronic analysis

Planning for synchronic and/or diachronic analysis was another important consideration described in the LQR literature we reviewed (Saldaña, 2003; Weller, 2012; see [Supplementary Appendix 4](#) for additional references using these approaches). We found most researchers used a diachronic approach (i.e., analysis was conducted after all

data were collected). A diachronic approach, also referred to as a trajectory approach (Grossoehme & Lipstein, 2016), allowed for a more in-depth perspective because it took into consideration all waves of data to understand change over time. Diachronic analysis was appropriate when a researcher was interested in understanding individual or small group experiences or processes over time. In conjunction with coding, matrix displays were sometimes used with this approach because it allowed the researcher to visually and systematically examine how individuals or processes compared over time (Grossoehm & Lipstein, 2016; Saldana 2003).

Synchronic analytic methods (i.e., simultaneous analysis or analysis after each wave of data collection) were briefly mentioned in many papers we reviewed; however, how researchers carried out synchronic analyses throughout the study was rarely described. Synchronic analysis is an iterative process to analyze data and identify preliminary results to inform future collection and analysis waves. Synchronic analysis was conducted following a data collection wave (Benoot et al., 2015; Calman et al., 2013; Henderson et al., 2012; Manthorpe et al., 2014; Smith, 2003), or simultaneously throughout each wave of data collection (e.g., after the interview using post-interview notes) (Webster et al., 2015).

For instance, Ayalon (2016, 2018) used a synchronic approach to analyze the first LQR wave to obtain a broad overview of CCRC residents' experiences and guide future study design accordingly. By analyzing the first wave, it became clear that certain topics were not adequately addressed by the interview guide. This realization fueled development of the next waves, which addressed areas requiring further attention such as CCRC staff members' roles or the presence of nursing units (Ayalon, 2016, 2018). Synchronic analyses allowed researchers to capitalize on their growing experience and knowledge with their target population and research topic. Hence, synchronic analysis provided an opportunity to evaluate existing data and make changes to and strengthen subsequent data collection waves.

### Consistent or evolving coding

Some studies reviewed used consistent codes/domains to assess time perspective and/or change over time (Benoot et al., 2015; Murray et al., 2012; Plumridge & Thomson, 2003). For example, Murray and coworkers (2012) used a longitudinal coding matrix (Saldaña, 2003, 2015) to systematically compare and contrast the same domains related to acute health care episodes. In contrast, other studies used evolving or iterative analysis of longitudinal qualitative data (e.g., theoretical sampling and open coding) allowing researchers to identify emergent domains/codes at later time points (Benoot et al., 2015). In evolving LQR coding, change over time was not always the focus, but rather, sometimes multiple time points were used to obtain an in-depth understanding of the main study topic(s).

### Individual or group analysis

Another LQR consideration described in the literature was analyzing time perspective and change on individual and/or group levels. Studies that analyzed change in the same individual over time often presented a few exemplary case studies/biographies/profiles in their results (Calman et al., 2013; Henderson et al., 2012; Murray et al., 2012; Plumridge & Thomson, 2003; Smith, 2003; Tallman et al., 2012; Tomanović, 2003; Watson et al., 1991). In a study on the reflexive self, Plumridge and Thomson (2003) conducted within-individual comparisons to examine concepts of fateful moments and shame in life transitions. This approach provided a refined way to define change as occurring within an individual respondent, rather than in an aggregate way across respondents over time. The individual approach allowed for an in-depth analysis of change within the same respondent over time but is problematic when participants drop out of the study (Manthorpe, Iliffe, Harris, Moriarty, & Stevens, 2018). Group analysis is less constrained by participant retention issues and useful when the researcher is interested in a broad understanding of a research topic or change over time (Bradley, Webster, Baker, Schlesinger, & Inouye, 2005; Carthron, Bailey, & Anderson, 2014; Nissim et al., 2009).

In summary, we found that even when LQR data collection and analysis occurred over multiple time points, analysis may or may not focus centrally on change over time. For example, some studies described change over time as part of the analysis process and then presented this information in their results (Benoot et al., 2015; Henderson et al., 2012; Manthorpe et al., 2014; Murray et al., 2012; Nelson et al., 2015; Plumridge & Thomson, 2003; Smith, 2003; Tomanović, 2003; Weller, 2012; Yates, 2003). However, many LQR studies did not clearly describe how analysis was carried out (e.g., comparison of themes or questions) to assess change over time. Most LQR literature we reviewed did not fully describe how change over time was analyzed or how change over time was linked to the presentation of their results, which left gaps in how to characterize best practices for LQR analysis.

### Discussion and Implications

Given the growing interest in longitudinal research, especially by qualitative aging scholars, understanding the current field of LQR is timely (Thomson & McLeod, 2015). Our literature review highlights important considerations for novice and advanced researchers in implementing LQR. The LQR literature and LQR methods themselves have important strengths and weaknesses. The LQR literature highlights that a strength of LQR methods is the ability to obtain a more comprehensive view of change over time and/or time perspective by analyzing multiple data waves over an extended period. Specifically, this approach provides (a) in-depth information otherwise unobtainable through cross-sectional research, (b) a rich and nuanced

understanding of human experience across the life course and the aging process, (c) opportunities for researchers to build off of previous waves of data collection to refine research questions and generate new knowledge in future waves, and (d) information on whether and how aging processes or gerontological topics remain the same or vary over time.

We also recognize some important limitations in LQR literature. Overall, some of LQR's greatest challenges involve management of large amounts of data, analytic scope, and deciding when analysis should occur. The complexity and richness of LQR methodological decisions are often overlooked or underreported in existing literature today. The depth and breadth of information can be overwhelming, even for experienced researchers. Our review describes some of the important design and analysis decisions throughout and highlights the various intellectual, logistical, and practical challenges associated with LQR. Major limitations of the literature were inadequate description of design and analysis characteristics. Researchers were not always explicit about whether interview questions, codes, or interviewers remained consistent or changed over time. Consistent questions and codes foster systematic comparisons across time points. Yet, changing questions and codes is useful when new insight is gained throughout the study. We advocate for a hybrid approach to formally compare data time points and to gain new knowledge over time. In addition, the literature insufficiently focused on how lost-to-follow-up participants or attrition affected LQR data analysis. Some researchers did not report the exact number of time points used in their LQR analysis. Given the assumption that time matters and that information obtained in one time point may or may not resemble information obtained in other time points, this lack of detail is problematic. At times, LQR researchers did not explain adequately how data were analyzed. Analyzing the data within interviews and then across interviews might result in various conclusions compared with the analysis of interviews over time, while disregarding individual differences over time. Nonetheless, LQR researchers did not always state the purpose of the study explicitly when describing their methods of data collection and analysis. We offer these critiques to improve intellectual and research rigor going forward. Otherwise, LQR's strengths of flexibility and creativity in terms of understanding life course issues can become its greatest weaknesses.

## Recommendations

On the basis of our literature review, LQR design and analysis can be enhanced by including the following: (a) systematic comparisons of two or more time points; (b) a research question that addresses change or time perspective; (c) transparency about what is compared such as codes, domains, interview questions, matrices, or cases; (d) description of when the analyses occurred (i.e., synchronic

or diachronic); and (d) discussion of how the analyses may or may not have evolved over time and if the process was simultaneous and/or iterative. We also offer the following suggestions.

### Time points and duration

Researchers should provide a rationale for how and why time points and duration were selected for their LQR study because there is controversy over what should be classified as LQR (e.g., is 1 week or 1 month acceptable for an LQR study as some authors contend). The benefit of our review is that we point out the authors' own viewpoints and language regarding what makes their work longitudinal. Our reporting strategy is a contribution to understanding the current state of LQR literature overall and that is a good basis for moving on to consider what should be done as best practices (and for what reason) going forward.

### Rapport and retention

It would be helpful if researchers provided more information about rapport and retention strategies used throughout their LQR studies. For example, researchers should describe their decision making and/or the implications of interviewer changes/consistency in LQR. Having the same interviewer may improve rapport over time; yet, this strategy may not be possible for all studies because of staff turnover or availability. Transitioning interviewers and/or bringing new interviewers up to date on a participant's history is critical. Relying on multiple interviewers is another form of triangulation. Information gathered by multiple interviewers provides opportunities to sort interviewer effects from types of data obtained.

### Consistent or evolving sampling

Researchers should consider how adding new participants and/or different types of participants may enhance study conclusions. However, this approach can complicate analyses, especially with differential retention. In gerontology, if older adults become sicker over time and less likely to participate in follow-ups, whereas their adult children are accessible for interviews, we might sometimes obtain alternate perspectives from more easily available data sources. Hence, we need to clarify what perspectives are being gained or missed by collecting reachable narratives or information. Researchers should describe if lost-to-follow-up participants were excluded from the study, explain if and how missing data from lost-to-follow-up participants affect analyses, and share general strategies for handling missing LQR data. When designing gerontological LQR, researchers should consider initially oversampling, expecting participants may drop out over the course of the study for various reasons (e.g., health, relocation, or death).

### Consistent or different data collection

Consistent data collection throughout LQR provides a more straightforward approach to making systematic

comparisons; however, researchers may want to consider if different data collection offers benefits (i.e., flexibility) to their LQR. Integrating different data collection methods is a form of data triangulation (Hartley & Sturm, 1997). If diverse methods of data collection over time result in consistent findings, one could argue that triangulation provides greater support for study conclusions. Yet, diverse approaches introduce additional sources of change requiring consideration. Data derived from in-depth interviews, focus groups, and observation may all differ. In-depth interviews usually allow for discussing sensitive topics in detail. Focus group interviews allow for a group dynamic that can lead to topics that might not come up in individual interviews or where people feel comfortable discussing things in the presence of others who share certain attributes (Briller, Schim, Meert, & Thurston, 2008).

### Consistent or different qualitative measures

When designing LQR measures, we suggest using a hybrid approach, including the same and new questions over different time points because it allows (a) the comparison of domains and responses over time, and (b) the development and elaboration of certain topics based on newly acquired data. For successful implementation, data obtained in earlier waves can be analyzed and guide subsequent waves. Because variability in measures or interview guides is allowed and even encouraged in LQR, researchers should provide their interview guides or example questions and describe changes over time to enhance the reader's understanding of analyses, results, and interpretations.

### Synchronic or diachronic analyses

Waiting until all data are collected (diachronic) is useful for an in-depth perspective on change over time, but can result in difficulty analyzing massive amounts of qualitative data and missed opportunities to thoughtfully prepare for the next wave of data collection or measure change.

Even within a larger LQR framework (which is expected to result in multiple waves) conducting simultaneous and focused analysis on a single wave (synchronic) is useful. This incremental and iterative strategy allows for ongoing evaluation of existing data, preparing for amendments and refinements in future waves, and disseminating early research results. Researchers should develop strategies for conducting synchronic analyses throughout LQR. It is important to realize that if the time points are too close together, it might be difficult to analyze amassed data on time to guide further collection efforts. If interviews are spaced further apart, this analysis strategy is more feasible. Researchers may or may not focus on change when analyzing a single time point (i.e., all data from one data collection wave) because it is often the focus of analysis once all data are collected.

As few researchers clarify how synchronic LQR is carried out, we suggest drawing from rapid qualitative analysis techniques, which are designed to meet short

research timelines but may provide specific strategies for analyzing data during or shortly after each wave of LQR data collection (Beebe, 2014; Burgess-Allen & Owen-Smith, 2010; Neal, Neal, VanDyke, & Kornbluh, 2014; Sobo, 2003). Using rapid techniques will also help LQR researchers acquaint themselves with the data gradually over an extended period (Morse, 2015). Compared to traditional qualitative analysis, rapid techniques involve a more focused review of interview/field notes, audio recordings, or transcripts depending on the researcher's preference (Neal, Neal, VanDyke, & Kornbluh, 2014). Usually only a subset of data are analyzed or the researcher takes on a big picture (i.e., less detailed) approach using templates, mind maps, or matrices to summarize the results (Bernard, Wutich, & Ryan, 2016). Rapid techniques may help researchers publish synchronic LQR early on and throughout the study, rather than waiting to publish once all waves are collected and analyzed. Moreover, other gerontological scholars, practitioners, and community members can benefit from new knowledge being disseminated more quickly and incorporated into working with older adults and understanding their lives more fully.

In summary, if only a diachronic approach is used (typical of many studies we reviewed), opportunities can be missed to identify themes or questions for addressing in subsequent waves. We suggest a combined plan, which consists of synchronic, rapid, simultaneous, or incremental analysis throughout or shortly after each data wave, followed by more in-depth analysis (diachronic) once all data are collected, which may have dual benefits. We believe analyzing data as they are collected critically guides study design and analysis. For a deeper understanding of time's passage, it is ultimately important to compare and contrast data across all waves with a diachronic approach.

### Consistent or evolving coding

The iterative nature of qualitative research and coding processes are major strengths overall, and for gerontological literature in particular. The iterative nature of the coding is essential for deepening our understandings of how aging and life course issues are experienced, how perceptions may change, and/or meaning-making processes over time. In gerontology where the importance of ideas such as life experience, insight, and perceptions over time has primacy, the value of going over material again to revisit what has been learned and then refining analyses cannot be overstated.

### Individual or group analyses

When preparing an LQR study, researchers should consider the pros and cons of analyzing data and presenting results on an individual level (in-depth or narrow view), the group level (broad view), or a combination of both. To strengthen LQR, it would be helpful for researchers to describe some of the decision making around how the overall research



questions relates to their analytic choices and the presentation of their results.

## Conclusion

Our review highlights variation in LQR design and analysis approaches used in the field of gerontology. The diversity of how LQR is conducted contributes to richness and depth, which are the hallmarks of qualitative research, and especially matter for studying how people move through and change over their lives. Openness to different LQR designs and analyses provide fertile grounds for innovation and creativity that can be used to enhance aging theory, practice, and policy. This review discussed different types of LQR designs and analyses to help researchers identify their desired approach, while accounting for various strengths and limitations. By calling for more elaboration in how LQR issues are conceptualized and methodologically handled, we believe the end result will be an advancement of LQR overall and that will be of great benefit when tackling rich and complex topics such as aging and life course issues.

## Supplementary Material

Supplementary data are available at *The Gerontologist* online.

## Funding

The authors received no financial support for the research, authorship, and/or publication of this article. The study describing continuing care retirement communities (CCRC) residents and their adult children was supported by a grant from the Israel Science Foundation (ISF801-13 to L. A.).

## Acknowledgements

The views expressed in this article are those of the authors and do not necessarily represent the views of the U.S. Department of Veterans Affairs.

## Conflict of Interest

We have no conflict of interest to declare.

## References

- Agren, M. (1998). Life at 85 and 92: A qualitative longitudinal study of how the oldest old experience and adjust to the increasing uncertainty of existence. *International Journal of Aging & Human Development*, *47*, 105–117. doi:10.2190/QXB6-1RT8-TFQ2-D33B
- Averill, J. B. (2002). Matrix analysis as a complementary analytic strategy in qualitative inquiry. *Qualitative Health Research*, *12*, 855–866. doi:10.1177/104973230201200611
- Ayalon, L. (2016). Do not hear, see, or speak: Views of older residents and their adult children about the nursing unit in the continuing care retirement community. *International Psychogeriatrics*, *28*, 1867–1877. doi:10.1017/S1041610216000788
- Ayalon, L. (2018). Transition and adaptation to the continuing care retirement community from a life course perspective: Something old, something new, and something borrowed. *Journal of Applied Gerontology*, *37*, 267–288. doi:10.1177/0733464816637851
- Ayalon, L. & Greed, O. (2016). A typology of new residents' adjustment to continuing care retirement communities. *Gerontologist*, *56*, 641–650. doi:10.1093/geront/gnu121
- Beebe, J. (2014). *Rapid qualitative inquiry: A field guide to team-based assessment* (2nd ed.). Maryland, MD: Rowman & Littlefield.
- Benoot, C., Deschepper, R., Grypdonck, M., Saelaert, M., & Bilsen, J. (2015). Acting independently while living alone: The strategies and struggles of cancer patients. *Qualitative Health Research*, *25*, 1033–1043. doi:10.1177/1049732315590402
- Bernard, H. R., Wutich, A., & Ryan, G. W. (2016). *Analyzing qualitative data: Systematic approaches*. Thousand Oaks, CA: Sage Publications.
- Bradley, E. H., Webster, T. R., Baker, D., Schlesinger, M., & Inouye, S. K. (2005). After adoption: Sustaining the innovation. A case study of disseminating the hospital elder life program. *Journal of the American Geriatrics Society*, *53*, 1455–1461. doi:10.1111/j.1532-5415.2005.53451.x
- Briller, S. H., Schim, S. M., Meert, K. L., & Thurston, C. S. (2008). Special considerations in conducting bereavement focus groups. *Omega (Westport)*, *56*, 255–271. doi:10.2190/om.56.3.c
- Burgess-Allen, J. & Owen-Smith, V. (2010). Using mind mapping techniques for rapid qualitative data analysis in public participation processes. *Health Expectations*, *13*, 406–415. doi:10.1111/j.1369-7625.2010.00594.x
- Calman, L., Brunton, L., & Molassiotis, A. (2013). Developing longitudinal qualitative designs: Lessons learned and recommendations for health services research. *BMC Medical Research Methodology*, *13*, 14. doi:10.1186/1471-2288-13-14
- Carduff, E., Murray, S. A., & Kendall, M. (2015). Methodological developments in qualitative longitudinal research: The advantages and challenges of regular telephone contact with participants in a qualitative longitudinal interview study. *BMC Research Notes*, *8*, 142. doi:10.1186/s13104-015-1107-y
- Carthron, D. L., Bailey, D. E. Jr., & Anderson, R. A. (2014). The “invisible caregiver”: Multicaregiving among diabetic African-American grandmothers. *Geriatric Nursing (New York, N.Y.)*, *35*(2 Suppl), S32–S36. doi:10.1016/j.gerinurse.2014.02.013
- Corden, A. & Millar, J. (2007a). Qualitative longitudinal research for social policy—introduction to themed section. *Social Policy and Society*, *6*, 529–532. doi:10.1017/S1474746407003867
- Corden, A. & Millar, J. (2007b). Time and change: A review of the qualitative longitudinal research literature for social policy. *Social Policy and Society*, *6*, 583–592. doi:10.1017/s1474746407003910
- Doran, N. J. (2014). Experiencing wellness within illness: Exploring a mindfulness-based approach to chronic back pain. *Qualitative Health Research*, *24*, 749–760. doi:10.1177/1049732314529662
- Flick, U. (1992). Triangulation revisited: Strategy of validation or alternative? *Journal for the Theory of Social Behaviour*, *22*, 175–197. doi:10.1111/j.1468-5914.1992.tb00215.x

- Gough, D., Thomas, J., & Oliver, S. (2012). Clarifying differences between review designs and methods. *Systematic Reviews*, *1*, 28. doi:10.1186/2046-4053-1-28
- Grant, M. J. & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal*, *26*, 91–108. doi:10.1111/j.1471-1842.2009.00848.x
- Grossoehme, D. & Lipstein, E. (2016). Analyzing longitudinal qualitative data: The application of trajectory and recurrent cross-sectional approaches. *BMC Research Notes*, *9*, 136. doi:10.1186/s13104-016-1954-1
- Hansen, L., Rosenkranz, S. J., Vaccaro, G. M., & Chang, M. F. (2015). Patients with hepatocellular carcinoma near the end of life: A longitudinal qualitative study of their illness experiences. *Cancer Nursing*, *38*, E19–E27. doi:10.1097/NCC.0000000000000188
- Hartley, R. I. & Sturm, P. (1997). Triangulation. *Computer Vision and Image Understanding*, *68*, 146–157. doi:10.1006/cviu.1997.0547
- Henderson, S., Holland, J., McGrellis, S., Sharpe, S., & Thomson, R. (2012). Storying qualitative longitudinal research: Sequence, voice and motif. *Qualitative Research*, *12*, 16–34. doi:10.1177/1468794111426232
- Hermanowicz, J. C. (2013). The longitudinal qualitative interview. *Qualitative Sociology*, *36*, 189–208. doi:10.1007/s11133-013-9247-7
- Hsieh, H. F. & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*, 1277–1288. doi:10.1177/1049732305276687
- Kemp, C. L., Ball, M. M., & Perkins, M. M. (2015). Couples' social careers in assisted living: Reconciling individual and shared situations. *Gerontologist*, *5*, 841–854. doi:10.1093/geront/gnv025
- Koelsch, L. E. (2015). Reconceptualizing the member check interview. *International Journal of Qualitative Methods*, *12*, 168–179. doi:10.1177/160940691301200105
- Lynch, C. & Danelly, J. (Eds.). (2013). *Transitions and transformations: Cultural perspectives on aging and the life course* (Vol. 1). New York: Berghahn Books.
- Manthorpe, J., Iliffe, S., Harris, J., Moriarty, J., & Stevens, M. (2018). Frailty and social care: Over- or under-familiar terms? *Social Policy and Society*, *17*, 23–33. doi:10.1017/S1474746416000427
- Manthorpe, J. & Samsi, K. (2016). Care homes and the Mental Capacity Act 2005: Changes in understanding and practice over time. *Dementia (London, England)*, *15*, 858–871. doi:10.1177/1471301214542623
- Manthorpe, J., Samsi, K., & Rapaport, J. (2014). Dementia nurses' experience of the Mental Capacity Act 2005: A follow-up study. *Dementia (London, England)*, *13*, 131–143. doi:10.1177/1471301212454354
- Martinson, M. & Berridge, C. (2015). Successful aging and its discontents: A systematic review of the social gerontology literature. *Gerontologist*, *55*, 58–69. doi:10.1093/geront/gnu037
- Mein, G., Seale, C., Rice, H., Johal, S., Ashcroft, R. E., Ellison, G., & Tinker, A. (2012). Altruism and participation in longitudinal health research? Insights from the Whitehall II Study. *Social Science & Medicine (1982)*, *75*, 2345–2352. doi:10.1016/j.socscimed.2012.09.006
- Mendez-Luck, C. A., Amorim, C., & Anthony, K. P. (2016). Talk versus action: Comparing the narratives and behaviors of diabetes self-management in Latino caregiving dyads. *Diabetes Educator*, *42*, 444–451. doi:10.1177/0145721716654007
- Mizrabi, T. (2007). Women's ways of organizing: Strengths and struggles of women activists over time. *Affilia*, *22*, 39–55. doi:10.1177/0886109906295762
- Moore, L., Frost, J., & Britten, N. (2015). Context and complexity: The meaning of self-management for older adults with heart disease. *Sociology of Health & Illness*, *37*, 1254–1269. doi:10.1111/1467-9566.12316
- Morse, J. M. (2015). Analytic strategies and sample size. *Qualitative Health Research*, *25*, 1317–1318. doi:10.1177/1049732315602867
- Murray, S. F., Akoum, M. S., & Storeng, K. T. (2012). Capitals diminished, denied, mustered and deployed. A qualitative longitudinal study of women's four year trajectories after acute health crisis, Burkina Faso. *Social Science & Medicine (1982)*, *75*, 2455–2462. doi:10.1016/j.socscimed.2012.09.025
- Neal, J. W., Neal, Z. P., VanDyke, E., & Kornbluh, M. (2014). Expediting the analysis of qualitative data in evaluation a procedure for the rapid identification of themes from audio recordings (RITA). *American Journal of Evaluation*, *36*, 118–132. doi:10.1177/1098214014536601
- Neale, B. (2015). Time and the lifecourse: Perspectives from qualitative longitudinal research. In N. Worth & I. Hardill (Eds.), *Researching the lifecourse: Critical reflections from the social sciences* (pp. 25–42). Chicago, IL: Policy Press.
- Neale, B. & Flowerdew, J. (2003). Time, texture and childhood: The contours of longitudinal qualitative research. *International Journal of Social Research Methodology*, *6*, 189–199. doi:10.1080/1364557032000091798
- Nelson, G., Patterson, M., Kirst, M., Macnaughton, E., Isaak, C. A., Nolin, D., ... Goering, P. N. (2015). Life changes among homeless persons with mental illness: A longitudinal study of housing first and usual treatment. *Psychiatric Services (Washington, D.C.)*, *66*, 592–597. doi:10.1176/appi.ps.201400201
- Nissim, R., Gagliese, L., & Rodin, G. (2009). The desire for hastened death in individuals with advanced cancer: A longitudinal qualitative study. *Social Science & Medicine (1982)*, *69*, 165–171. doi:10.1016/j.socscimed.2009.04.021
- Peek, S. T. M., Luijkx, K. G., Vrijhoef, H. J. M., Nieboer, M. E., Aarts, S., van der Voort, C. S., ... Wouters, E. J. M. (2017). Origins and consequences of technology acquirement by independent-living seniors: Towards an integrative model. *BMC Geriatrics*, *17*, 189. doi:10.1186/s12877-017-0582-5
- Pond, R., Stephens, C., & Alpass, F. (2010). How health affects retirement decisions: Three pathways taken by middle-older aged New Zealanders. *Ageing & Society*, *30*, 527–545. doi:10.1017/S0144686X09990523
- Plumridge, L. & Thomson, R. (2003). Longitudinal qualitative studies and the reflexive self. *International Journal of Social Research Methodology*, *6*, 213–222. doi:10.1080/1364557032000091815
- Porter, E. J., & Lanes, T. I. (2000). Targeting intermediaries to recruit older women for qualitative, longitudinal research. *Journal of Women & Aging*, *12*, 63–75. doi:10.1300/J074v12n01\_05
- Richardson, J. C., Grime, J. C., & Ong, B. N. (2014). "Keeping going": Chronic joint pain in older people who describe their health as good. *Ageing and Society*, *34*, 1380–1396. doi:10.1017/S0144686X13000226

- Robinson, J., Gott, M., Gardiner, C., & Ingleton, C. (2015). A qualitative study exploring the benefits of hospital admissions from the perspectives of patients with palliative care needs. *Palliative Medicine*, *29*, 703–710. doi:10.1177/0269216315575841
- Saldaña, J. (2003). *Longitudinal qualitative research: Analyzing change through time*. Walnut Creek, CA: AltaMira Press.
- Saldaña, J. (2015). *The coding manual for qualitative researchers*. Thousand Oaks, CA: Sage Publications.
- Schoenberg, N. E. & McAuley, W. J. (2007). Promoting qualitative research. *Gerontologist*, *47*, 576–577. doi:10.1093/geront/47.5.576
- Schoenberg, N. E., Miller, E. A., & Pruchno, R. (2011). The *Gerontologist*: Strong and getting stronger. *Gerontologist*, *51*, 281–284. doi:10.1093/geront/gnr032
- Smith, N. (2003). Cross-sectional profiling and longitudinal analysis: Research notes on analysis in the longitudinal qualitative study, 'Negotiation Transitions to Citizenship'. *International Journal of Social Research Methodology*, *6*, 273–277. doi:10.1080/1364557032000091888
- Sobo, E. (2003). A model protocol for applying anthropology in rapid health services evaluations. *Practicing Anthropology*, *25*, 39–42. doi:10.17730/praa.25.2.u17g513627w57552
- Tallman, K., Greenwald, R., Reidenouer, A., & Pantel, L. (2012). Living with advanced illness: Longitudinal study of patient, family, and caregiver needs. *Permanente Journal*, *16*, 28–35. doi:10.7812/tpp/12–029
- Thomson, R. & Holland, J. (2003). Hindsight, foresight and insight: The challenges of longitudinal qualitative research. *International Journal of Social Research Methodology*, *6*, 233–244. doi:10.1080/1364557032000091833
- Thomson, R. & McLeod, J. (2015). New frontiers in qualitative longitudinal research: An agenda for research. *International Journal of Social Research Methodology*, *18*, 243–250. doi:10.1080/13645579.2015.1017900
- Tomanović, S. (2003). Capturing change: Doing research in a society undergoing transformation. *International Journal of Social Research Methodology*, *6*, 267–271. doi:10.1080/1364557032000091879
- Tong, A., Flemming, K., McInnes, E., Oliver, S., & Craig, J. (2012). Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Medical Research Methodology*, *12*, 181. doi:10.1186/1471-2288-12-181
- Torregrosa, M., Ramis, Y., Pallarés, S., Azócar, F., & Selva, C. (2015). Olympic athletes back to retirement: A qualitative longitudinal study. *Psychology of Sport and Exercise*, *21*, 50–56. doi:10.1016/j.psychsport.2015.03.003
- Watson, L., Irwin, J., & Michalske, S. (1991). Researcher as friend: Methods of the interviewer in a longitudinal study. *Qualitative Health Research*, *1*, 497–514. doi:10.1177/104973239100100406
- Webster, F., Perruccio, A. V., Jenkinson, R., Jaglal, S., Schemitsch, E., Waddell, J. P., ... Davis, A. M. (2015). Understanding why people do or do not engage in activities following total joint replacement: A longitudinal qualitative study. *Osteoarthritis and Cartilage*, *23*, 860–867. doi:10.1016/j.joca.2015.02.013
- Weller, S. (2012). Evolving creativity in qualitative longitudinal research with children and teenagers. *International Journal of Social Research Methodology*, *15*, 119–133. doi:10.1080/13645579.2012.649412
- Yates, L. (2003). Interpretive claims and methodological warrant in small-number qualitative, longitudinal research. *International Journal of Social Research Methodology*, *6*, 223–232. doi:10.1080/1364557032000091824