Mixed Methods Longitudinal Research

Vogl, Susanne

Veröffentlichungsversion / Published Version
Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:
Vogl, S. (2023). Mixed Methods Longitudinal Research. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *24*(1). https://doi.org/10.17169/fqs-24.1.4012

FQS FORUM: QUALITATIVE SOCIAL RESEARCH SOZIALFORSCHUNG

Volume 24, No. 1, Art. 21
January 2023

Mixed Methods Longitudinal Research

Susanne Vogl

Key words: mixed methods research; longitudinal research; research design; time; integration

Abstract: Longitudinal research holds great promise for researching change and continuity. Qualitative and quantitative longitudinal research can be combined within a mixed methods framework, which enables gaining complementary insights that are more nuanced and more valid. However, longitudinal research generally entails more practical challenges than cross-sectional research. Further, combining qualitative and quantitative strategies in mixed methods longitudinal research (MMLR) multiplies these challenges. In this publication, I start by conceptualizing qualitative and quantitative longitudinal research and highlighting their respective strengths and challenges. I subsequently outline design options and implications of mixed methods longitudinal projects. Hereby, I distinguish traditional dimensions of mixed methods and longitudinal research designs, such as time and timing, priority, purpose, sampling, data collection, analysis and interpretation, and reporting. In MMLR these dimensions have an extended time dimension because these design decisions have to be made or revisited in each wave. With this contribution, I aim to advance conceptual thinking in an area of research that is certainly underdeveloped, but has great potential.

Table of Contents

Forum Qualitative Sozialforschung / Forum: Qualitative Social Research (ISSN 1438-5627)

1. Preface

Before I discuss mixed methods longitudinal research (MMLR), I want to clarify my starting point. The background and idea for this contribution are based on experiences in a five-year mixed methods longitudinal study "Pathways to the Future" (FLECKER, WÖHRER & RIEDER, 2020) on youth transitions. The data for this study were collected using qualitative interviews and self-administered online surveys. The practical experiences from this project and the challenges of integrating qualitative and quantitative results serve as a background for the current article, but I do not specifically refer to the project's results, which can be found elsewhere (e.g., FLECKER, WÖHRER & SCHELS, 2022; KOGLER, VOGL & ASTLEITHNER, 2023; VALLS, ASTLEITHNER, SCHELS, VOGL & KOGLER, 2022). [1]

Following the key role of interviews in social research, I mainly refer to interview-based research in this paper. My focusing here does not mean that interviews are the only, let alone the best way, to research the social. Limiting the discussion to interview research is a practical decision because collecting other forms of data might require different conceptualizations, and the definition of cases and thus sampling could be very different. [2]

2. Introduction

Social researchers aim to understand (*verstehen*) and explain (*erklären*) social phenomena. We can only understand and explain human behavior if we contextualize it in time and space (ADAM, 2013; BAUR, 2005). Thus, we have to take into account change as well as the process of change. Time is considered a central category—some would even say a precondition (ADAM, 2013)—to social science theory and research. Time is omnipresent, an integrative part to the social and subjective meaning-making (SCHILLING & KÖNIG, 2020), and it is linked to processes including change and continuity. Processes are complex and multidimensional—yet core to understanding societies and social change. "Most social phenomena are part of the flow of history; they evolve and, in doing so, produce changes themselves" (BIDART, LONGO & MENDEZ, 2013, p.744). Comparatively recently, researchers in sociological theory and research refocused their attention on the temporality of societies (BAUR, 2008). Along with this *temporal turn* in social research (ADAM, 2013), researchers have called for more longitudinal research. Longitudinal research is designed to illuminate change (or continuity) and the underlying processes over time in individual life courses, groups, organizations, cities, and so on. Hereby, change can be understood as social change, transformation, or individual development, as well as the interplay of individual and social change. The study of change is a main task for sociologists, and longitudinal research is a key tool. [3]

With longitudinal research we can study how, when, and which change occurs, but also how social structures are solidified throug continuities (BIDART et al., 2013; CUERVO & COOK, 2020). In longitudinal research, we go beyond before-and-after measurements and aim to gain insights about the process of change

and its patterns in time (change through time) (SALDAÑA, 2003). According to Norbert ELIAS, sociologists have a tendency to reduce processes to static conditions (1978). ELIAS assumed in his process sociology that intertwined social processes of different kinds and on different levels—repetitive and nonrepetitive, micro and macro, short term and long term—are the stuff of social life and the proper field of sociological inquiry (ABBOTT, 2016). Change is not necessarily a distinct event with a start and an end date but a process, often triggered by an event or the anticipation thereof; for example, the transition to fatherhood is a phase instead of an abrupt change from being childless to being a father, although an important event—childbirth—is linked to this process. If we as researchers exclusively focus on events, dates, or variables, a processual analysis remains limited. In this vein, time can be conceptualized as *fixed* when measured with clocks and calendars, and *fluid* with reference to human experiences (NEALE, 2021). Researchers can extend their understanding of process and patterns in time by combining fixed and fluid aspects. Then longitudinal researchers can 1. detect changes over time, 2. explore the processes associated with change or stability, and 3. interpret the perspective of the person experiencing that change. [4]

Social behavior has a triple temporality. It happens in the present and refers to the past and to the future: Behavior and motives have been learnt, and goals are the product of past experiences and refer to the future. At the same time, behavior follows some regularities or patterns. The duration of any pattern in time includes the overall duration, the timing of key events, the pace of change, and the rhythm (BAUR, 2008). Furthermore, social processes differ in their duration, their timing, and the tempo or pace/momentum of the process (BAUR, 2005; NEALE, 2021). As a consequence, and depending on the phenomena under study, researchers have to adapt the longitudinal research design to these time-related aspects, for example, by deciding on the timing of data collection points. In this context, it is also important to mention that we need a reference point to identify change and at least a minimum of comparability between waves. [5]

NEALE's (2021) elaboration on planes of time is very helpful for planning longitudinal research and conceptualizing time for the analysis:

- *Time frame and tempo* can be intensive or extensive: Events can occur intensively over a short period of time or extensively over a longer period. This is an important consideration for researchers in planning the time frame and tempo of their longitudinal research. "The time frame of a [...] study reflects the overall time span through which it is conducted, while its tempo reflects the number, spacing, frequency and duration of visits to the field" (p.5).
- Furthermore, events and experiences unfold on different levels of the social—personal, interpersonal, institutional, generational, and historical—and thus *scales of time*. The temporal interplay of the micro-macro-plane is a core interest of longitudinal researchers. "The relationship between agency and structure, biography and history is essentially dynamic: it is only through time

that we can understand how these different scales of the social fabric are interconnected, and how they come to be transformed" (ibid.).

- Another plane of time is the orientation towards *future*, *present*, *and past.* Prospective and retrospective lenses are crucial for generating and analyzing longitudinal data (ibid.), and relating and comparing these orientations can be helpful in understanding processes. [6]

All this highlights that "time is an important theme of investigation, as well as the framework through which a study unfolds" (p.33). When researchers choose a longitudinal research design, time and temporality are central to the substantive research interest, and with this interest they also affect research practice—as well as participants' perceptions and memories (e.g., BELLI, 1998). [7]

In the next section (Section 3), I briefly highlight specifics of qualitative and quantitative longitudinal research before I outline MMLR purposes and design options as well as implications for MMLR projects (Section 4). I base design decisions on traditional dimensions of mixed methods research (MMR) such as timing, priority, level of interdependence, points of interface, and level of integration. In MMLR, these dimensions have an extended time dimension—for all waves, these design decisions have to be made or revisited. I illustrate the dynamic research process in MMLR balancing stability and change—both in content and procedures. In Section 5, I conclude and discuss the consideration. [8]

3. Qualitative and Quantitative Longitudinal Research

Before I discuss qualitative and quantitative longitudinal research in more detail, the term *longitudinal* has to be clarified. Although the term *longitudinal research* is often used as synonym for panel research, a longitudinal study *could* be designed as a panel or a trend study. Only if the sample (in its majority) and the data collection methods are kept stable is a study called a panel study (WITZEL, 2020). In longitudinal (panel) research, the same people are interviewed several times at roughly fixed intervals (e.g., every two years) or around certain events (e.g., before and after childbirth). Thus, in panel research, we can make a direct connection on the individual level. In trend studies—although they are also longitudinal—we can merely compare aggregate levels across waves because different sample units are researched across waves. Only with panel studies we can differentiate between differences and developments on an individual level over time as well as determine the interplay between individual and aggregate level developments. As a side note, some researchers also call retrospective or biographical (qualitative) interviews longitudinal. However, retrospective methods are considered "temporally oriented" rather than longitudinal (VOGL, 2022); specifically, participants look back and offer a certain view from a specific point in time. In comparison, panel studies involve accumulating the retrospective and prospective views for the same individuals at several points in time (KRAUS, 2000). By analyzing the interplay of hindsight and foresight across time, researchers gain a stronger process orientation. [9]

In the literature, no time span is specified for what makes a study longitudinal. However, at minimum, the consensus seems to be that there needs to be the elapse of a sufficient amount of time between waves for change to appear because change (or stability) is the core research interest to conduct longitudinal research. Because longitudinal researchers want to go beyond a pre-post-test, a minimum of three measurement points is sometimes considered necessary for a study to be considered longitudinal (PLANO CLARK et al., 2015; VAN NESS, FRIED & GILL, 2011). [10]

Quantitative longitudinal research (QnLR) has a long tradition in social research —either in the form of trend studies (e.g., monitoring social change across larger time periods as in the European Social Survey) or as panel studies with a focus on individual change (e.g., the British Household Panel). Qualitative longitudinal research is less common but growing in popularity, and most of these studies are based on interview panels, such as the project under the TIMESCAPES framework in the United Kingdom (e.g., HOLLAND, 2011; NEALE, HENWOOD & HOLLAND, 2012). [11]

Traditionally, QnLR has been considered as the *gold standard*. QnLR is used to show changes in the population or subgroups of the population from one time to another. In order to capture patterns in time, researchers use statistical analysis, such as cohort, time series, survival, and event history analyses (BAUR, 2005), building on principles of repeated measure analysis of variance, structural equation modeling, multi-level analysis, loglinear analysis and Markov modeling, and multiple correspondence analysis (BIJLEVELD et al., 1998). Standardization of instruments, the repeated measurement of the same variables, and thus comparability is crucial for employing these methods. However, these requirements result in limitations to the adaptability of the research design. [12]

Qualitative longitudinal research (QLR) is more difficult to categorize (REICHERTZ, 2019), but it often entails narrative approaches. Researchers in QLR include the time dimension to detect changes over time, explore the processes associated with these changes, generate a dynamic view on continuity and change (SHIRANI & HENWOOD, 2010), and trace lived experiences of change, including changes in the participants' (or researchers') interpretation (CALMAN, BRUNTON & MOLASSIOTIS, 2013; LEWIS, 2007). Participants and researchers look backwards and forwards with a shifting reference point; what was the future in the first wave becomes the past in the last wave. Thus, a QL data set is more than the sum of its parts. Contradictions between accounts over time—also due to memory issues (BELLI, 1998; BELLI, STAFFORD & ALWIN, 2009)—, "repetitions, silences and recurrent motifs all provide insights that go beyond what is possible with one-off qualitative research" (McLEOD & THOMSON, 2009, p.75). Using the *long view* (THOMSON, 2007), QLR researchers aim for a deep understanding of personal life trajectories as they unfold, and they strive to understand the dynamics between context and subjectivity, as well as the intersection of biography, history, and society, particularly in times of transitions or critical moments (BERNARDI & MORTELMANS, 2018; HENWOOD & PROCTER, 2003; McLEOD & THOMSON,

2009; MILLER, 2005; NEALE et al., 2012; SHIRANI & HENWOOD, 2010). However, with a strong reliance on interview methods, researchers run the risk of gross effects of subjectivity and claims affected by self-interest (ATKINSON & SILVERMAN, 1997), and thus the study of the biographical intersection with society could be hampered. [13]

To build on the strengths of each type of method and to offset the limitations, a combination of (qualitative and quantitative) methods could be employed to study the complexity at the intersection of individual biography and social and historical time (BURZAN, 2020). Qualitative and quantitative designs can be seen as complementary, brought in dialog to enrich the understanding of the interplay of structure and individual biography. To summarize, quantitative approaches are fundamentally based on the assumption of comparability across waves of data collections and model processes based on variables. The aim is to develop theoretical models to illuminate and predict patterns and underlying social mechanisms. With qualitative approaches, researchers can study how causal processes unfold (BIDART et al., 2013; PETTIGREW, 1995). As KELLE (2001) ascertained,

> "quantitative and qualitative methods usually provide information on different levels of sociological description: quantitative analyses show phenomena on an aggregate level and can thereby allow the description of macrosocial structures. Although qualitative data may also relate to phenomena on a macrosocietal level, their specific strength lies in their ability to lift the veil on social microprocesses and to make visible hitherto unknown cultural phenomena" (§17). [14]

The distinction between the two lies in a narrative versus a variable-based conceptualization of process (BIDART et al., 2013). In other words, "trajectories such as life events sequences and the set of constraints in which they evolve can be described through the statistical analyses of large survey data, while biographical actions and their logic are illustrated by qualitative analyses" (BERNARDI, 2021, p.119). This leads us to the next step, conceptualizing MMLR designs and purposes. [15]

4. Mixed Methods Longitudinal Research

4.1 Defining the mixed methods territory

MMR has been defined in various ways. Nevertheless, "most researchers 'know' mixed methods when they meet them, but attempts to precisely define the term have been largely unsuccessful" (BAZELEY, 2003, p.116). A recent definition by Elisabeth CREAMER (2022) seems well suited for our context: Mixed method research is characterized by "a systematic approach to data collection and analysis that combines different sources of data and quantitative and qualitative analytical procedures with the intention to engage multiple perspectives in order to more fully understand complex social phenomenon" (p.7). Using MMR, researchers can benefit from complementary insight: While qualitative researchers engage with context and individual perspectives and narratives,

quantitative methods are used to create findings that can be generalized to a larger population but also facilitate comparisons between groups and magnitudes (BAMATTRE, SCHOWENGERDT, NIKOI & DeJAEGHERE, 2019). Commonly stated purposes of MMR are "to corroborate results, to capture the complexity of the phenomenon, and to enrich the interpretation of one type of result with the other type" (PLANO CLARK et al., 2015, p.304). The combination may take many forms "including connecting results from one data set to the collection of data from another; juxtaposing quantitative and qualitative results for comparison; transforming one form of data to facilitate the other form of analysis; or forming interpretations from the two sets of results" (p.299). [16]

With MMLR, researchers have opportunities to integrate "components of quantitative, qualitative, and temporal information" (p.315). By mixing qualitative and quantitative data in a longitudinal study, researchers can gain both representative and granular data (NEVES, DIAS DE CARVALHO, SERRA, TORRES & FRAGA, 2019). The combination of both approaches can lead researchers to unique insights into change, continuities, and patterns in time (ELLIOTT, HOLLAND & THOMSON, 2008). Qualitative and quantitative longitudinal data can be used to create typologies of patterns in time but also to test hypotheses, and the two can cross-fertilize their interpretations (WENGER, 1999). [17]

4.2 MMLR design

With longitudinal approaches, researchers can investigate phenomena that change over time such as developmental processes, responses to interventions, and societal trends. However, investigators face many challenges implementing longitudinal designs (PLANO CLARK et al., 2015). These challenges multiply when qualitative and quantitative approaches are combined, and the practical implementation of such complex designs has received little research attention (PLANO CLARK et al., 2015; VAN NESS et al., 2011). PLANO CLARK et al. (2015) contended in their literature review that surprisingly little rigor is present in MMLR publications, and important information is missing or even contradictory. They assumed that authors, reviewers, and editors alike might lack a clear vision on how to best report complex longitudinal mixed methods designs. Despite this finding, researchers appear to be employing MMLR, make contributions to their respective fields, and are successfully publishing their results in peer-reviewed journals (ibid.). This finding is the point of departure for the following section: *How can we conceptualize and describe MMLR? What are decision points, and what are the implications?* The key question is how to connect or relate data across time and waves of data collection and generate added value. [18]

4.2.1 Reasons for and practice of mixing

A researcher sees a specific purpose in mixing methods in a longitudinal study and this perception determines the design. However, rationales for employing MMR are diverse, and I want to briefly outline the frequently stated purposes for MMR in general. GREENE, CARACELLI and GRAHAM (1989) identified five key motives, summarized concisely by MAYOH and ONWUEGBUZIE (2004):

> "*Triangulation*, to increase the validity of data and minimize bias; *complementarity*, to enhance the strengths and minimize the weakness of individual methods; *development*, to help use the results of one method to enhance another; *initiation*, to allow for analysis of data from different perspectives; and *expansion*, to increase the overall scope of research. This conceptualization demonstrates that mixed methods research may be adopted for one or more of the aforementioned purposes, when a single method in isolation is unable to explore adequately a single phenomenon" (pp.91-92). [19]

SCHOONENBOOM, JOHNSON and FROEHLICH (2018) extended this list along three (non-exclusive) groups of purposes: follow-up, comparison, and development. As *follow-up*, they subsume generalization to the same population, explanation of a finding, or replication. With *comparison*, researchers can aim for theory triangulation, method triangulation, researcher triangulation, participant triangulation, model triangulation, subgroup analysis, and complementary research questions. *Development* is related to the questionnaire, interview schedule, and research questions. [20]

For MMLR, the purposes have a longitudinal dimension. In MMLR these rationales can also be extended to the same strand across time and across strands over time. Purpose becomes even more complex because lines of comparisons multiply in MMLR: Researchers can conduct intra-individual comparisons across time and cross-case comparisons on longitudinal and cross-sectional bases. Depending on the research design, we can also compare qualitative and quantitative data. The practice of relating or integrating qualitative and quantitative strands is determined by these rationales. In MMLR, we can integrate data and methods at different points in time and in different ways. This could mean connecting results of one phase of data collection with the next, comparing qualitative and quantitative results, synthesizing complementary results, transforming data, or developing a typology (PLANO CLARK et al., 2015). With multiple references between strands and data analyses, researchers can enhance MMLR and the breadth, depth, and solidity of results (BURZAN, 2020). Integration occurs

> "to the extent that different data elements and various strategies for analysis of those elements are combined throughout a study in such a way as to become interdependent in reaching a common theoretical or research goal, thereby producing findings that are greater than the sum of the parts" (BAZELEY, 2012, p.816). [21]

In the following sections, I will go through decision points in the MMLR process and sketch options with respective practical and substantive consequences: 1. *time frame, timing*; 2. *status/priority of strands*; 3. *sampling and sample maintenance*; 4. *data collection methods and instruments*; and 5. *analyses and interpretation* (LEECH & ONWUEGBUZIE, 2009; PLANO CLARK et al., 2015; SCHOONENBOOM & JOHNSON, 2017). In MMLR, these decisions are recurrent and decisions at different time points can be made differently. I will also refer back to the purpose of a MMR design as necessary. [22]

4.2.2 Time frame and timing

The *time frame of a study* and *timing of data collection points* were mentioned earlier as being critical for detecting and describing change. Decisions about time and timing and the number and frequency of data collection are crucial in any longitudinal research. Ideally, time frame and tempo of a study are chosen appropriately for the momentum of the processes being researched. The time between waves needs to be long enough that change can occur, but short enough to trace processes and for respondents to remember. The start and end points of a project are not the beginning and end of a process, but the starting point inevitably serves as a reference point for detecting change or continuity in the course of a study. With a higher number of waves researchers can gain more granular information on processes and patterns in time. Furthermore, for the time between waves, we usually do not have data which can have the effect of change being disguised; for example, a change between wave 1 and 2 might not be captured because in wave 2, the same status as in wave 1 is obtained. However, a clear trade-off exists between frequency of data collection, detail, and overburdening participants. [23]

In concrete terms, when we were interested in the orientation process of adolescents in the school- to-work transition, the starting point of our data collection was considered the reference point. We then compared the educational and occupational trajectory in future annual waves with the aspirations in wave 1. Depending on the timing of our research encounters, we captured more or less information about adolescents' experiences and developing agency (KOGLER, VOGL & ASTLEITHNER, 2022). Thus, we interpreted processes differently depending on the time frame. Furthermore, particularly in times of transitions, we did not always find linear processes from an aspiration to its execution, but rather cyclical orientation processes whereby aspirations changed or became clearer or vaguer, or steps towards fulfilling aspirations could fail (KOGLER et al., 2023). However, when the time span between waves is too wide, some doubts, change of plans, or directions might not even become visible. [24]

With longitudinal research we have the opportunity to detect patterns in time. However, depending on the time horizon of the analysis, the same pattern can take on different shapes (BAUR, 2008); for example, a pattern in time may be stable for 10 years, but a turning point in year 11 could cause the process to become cyclical. Depending on the timing of a study and the section of the process captured, different conclusions may be drawn because "[s]tability is a

creation or, more often, a linguistic mirage" (ABBOTT, 2016, p.2). Further, we cannot say anything about the future direction. In longitudinal research, we cannot avoid these issues totally—also because they are somewhat individual—but we have to be aware of the perspectivity we have based on time and timing our research. [25]

In MMLR, timing also relates to the relationship of the occurrence of both strands, usually referred to as concurrent, sequential, or a combination of the two designs. Logically, different options are available for combining the qualitative and quantitative strands: The number of data collections can be equal or different in the two strands. An equal number of data gatherings would be called *fully longitudinal mixed methods research* (VAN NESS et al., 2011), for example, five waves of qualitative interviews and five waves of an online survey, as in our study (VOGL, WÖHRER & JESSER, 2020). [26]

As an alternative, one strand (qualitative or quantitative) could be implemented only at the beginning or the end of the process of gathering longitudinal data. VAN NESS et al. (2011) distinguished between prospective and retrospective longitudinal designs. In a *prospective design***,** qualitative data are collected once at the first time point of the quantitative longitudinal strand to examine participants' expectations about the issue to be measured quantitatively with multiple waves (PLANO CLARK et al., 2015; VAN NESS et al., 2011). In a *retrospective longitudinal* approach, qualitative data are collected once at the last wave of the quantitative longitudinal strand to examine participants' recollections of the issue that was measured quantitatively (ibid.). VAN NESS et al. (2011) assumed that the quantitative strand is longitudinal and the qualitative data collection is cross-sectional. However, it could also be that the qualitative strand is longitudinal with quantitative data collection at the beginning or end of the panel; however, this design seems to be rare. [27]

In Figure 1, I depict some basic ideas of MMLR designs. I only include information on frequency and timing of respective strands in the Figure. How the strands and waves are brought to correspondence can vary. Furthermore, the strands have not been labeled, which means they could be either qualitative or quantitative.

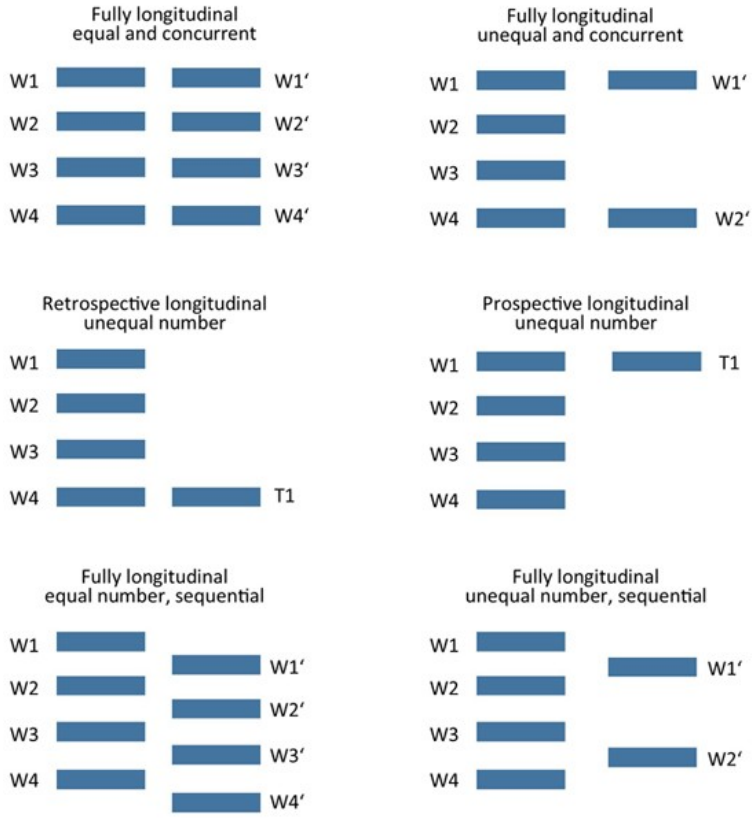

Figure 1: Research design examples for mixed methods longitudinal research [28]

As an additional design option, researchers have to consider the timing of qualitative and quantitative strands. In *exploratory* (*sequential*) *designs,* qualitative inquiry is followed by quantitative methods (CRESWELL, 2014). In our study, we not only had a qualitative pilot phase, but we also started the data collection for the qualitative strand one year before the quantitative strand. The idea was that qualitative results could be used to inform the standardized survey. Thus, wave 1 in the qualitative strand preceded wave 1 in the quantitative strand by one year (see Figure 1E). This timing also meant that qualitative wave 2 took place at the same time as quantitative wave 1. In order to take advantage of this exploratory sequential design, large resources have to be available, first of all, to analyze the qualitative data fast enough to inform the instrument development for the standardized survey and, second, to master two field phases in parallel. [29]

Explanatory (*sequential*) *designs* are used to explain initial quantitative results with qualitative research, with the quantitative being in focus. This could either be the case with an equal or unequal number of waves in the strands. For example, quantitative findings about processes, changes, and continuity based on latent class modelling (VALLS et al., 2022) can be explored for the identified classes with qualitative interview data to gain a more nuanced understanding of subjective perspectives and context (KOGLER et al., 2023). [30]

In practice, exploratory qualitative analysis followed by a confirmatory survey, as well as concurrent studies, seems to be the most common (CHRIST, 2007). In contrast, "longitudinal studies using quantitative and qualitative methods in sequence for exploratory purposes are rare, and no studies were found that combine exploratory quantitative analysis followed by both an exploratory cross-case analysis, and an exploratory longitudinal analysis" (p.226). [31]

To return to the purpose of mixing, qualitative and quantitative results can be used to cross-fertilize subsequent rounds of data collection. Note that a researcher will need to have enough time to analyze the data before the next field phase commences. For example, triangulation and complementarity are likely to remain purposes across all waves, but they could also only refer to a limited number of waves of data collection, for example, if there is only one wave of qualitative interviews at the end of a five-year survey panel. Development purposes are particularly appropriate in studies in which data collection waves of the qualitative and the quantitative strands are not taking place at the same time, for example, when qualitative analysis informs quantitative instrument development in one or more waves. The same is true for follow-up rationales. Beyond the issue of time and timing the priority of strands, the interdependence of samples, results, and integration in general has to be decided. [32]

4.2.3 Status and priority

Assigning priority and status to qualitative and quantitative strands is based on the purpose of MMR. Thus, the status of the approaches relates to their overall purpose and role and it affects the possibilities and practice of integration. The qualitative and the quantitative strands can be used with equal status, or one or the other can be assigned priority. Therefore, MMLR can have qualitative and quantitative approaches being equally important for answering the research question, or one strand can be dominant and thus have more weight in answering the research question. Most likely, in a design with an unequal number of waves (see Figure 1B, 1C, 1D, 1F), the dominant strand will contain more waves. However, with priority and status researchers do not decide on the interdependence of the strands. [33]

NEALE (2021) distinguished between linked versus nested studies. In a *linked longitudinal study*, qualitative research is run alongside a (larger) quantitative study. In a linked design, both strands can have equal status; timing and number are not defined. Thus, both strands could have equal or unequal numbers of waves, and they can be conducted concurrently or sequentially. The timing and the content serve as the bridge between the approaches, while participants are probably different and the link remains on an aggregate and not an individual level. For example, in our study following a fully longitudinal, equal number, sequential design (see Figure 1E), we could explore patterns of transition with respect to aspirations with latent class modelling of the quantitative data (e.g., the pattern "high stable," see VALLS et al., 2022, p.232) and illustrated these patterns with case histories that we purposefully select from the qualitative strand ("Fahiimo—evolving agency turns dreams into plans," see KOGLER et al., 2023,

p.7), which required at least preliminary analysis of the qualitative data beforehand to identify relevant cases. In this example, we mixed qualitative and quantitative research with follow-up and triangulation purposes. With the qualitative data, we could gain a deeper understanding to the patterns detected, particularly with respect to reasons for patterns and (coping) strategies. [34]

In a *nested design*, a limited number of participants from the quantitative panel participate in a qualitative strand over a limited period of time. In this case, the quantitative strand is assigned priority. With the qualitative part researchers further explore insights found in the quantitative data. For example, based on quantitative data, we identified extreme cases, specifically, adolescents who did not have any clear educational or occupational aspiration across waves versus adolescents who were on a clear trajectory towards a certain occupation and continuously work towards that goal. We wanted to understand the subjective perspective and life worlds of these contrasting types, and we purposefully sampled respondents from the two groups and invited them for qualitative interviews. Thus, we had a dependent sample with a small group of respondents participating in both qualitative and quantitative data collection. In this example, the quantitative strand had progressed over several waves, which enabled researchers to detect patterns before participants for qualitative interviews could be identified. The qualitative data collection would most likely be only cross-sectional—also because participating in qualitative and quantitative longitudinal panel research would overstretch participants' motivation. The advantage of this design is that individual comparisons of qualitative and quantitative data can be made, at least for a subgroup of the sample. [35]

In sum, with the distinction between linked and nested designs researchers add more precision to the research designs depicted in Figure 1. With decisions about status and priority, researchers determine the relation between strands in terms of priority in the overall research design, relatedness of results, and purpose of mixing. [36]

4.2.4 Sampling and sample maintenance

With their sampling strategies, researchers lay the ground for inferences they can draw—whether representational or theoretical. In MMLR panels, sampling becomes even more prominent. With sampling for wave 1, we determine future waves and the overall validity and (theoretical and statistical) generalizability. Generally, for qualitative and quantitative strands, the usual sampling strategies can be implemented: probability, purposive, or convenience sampling. In MMR, purposive and probability sampling can be combined in sequential or concurrent mixed methods (MM) sampling, with quantitative -> qualitative sampling being the most common technique (TEDDLIE & YU, 2007, p.89); for example, from an initial collection of quantitative data, sample members could be purposefully recruited for the qualitative strand. In concurrent MM sampling, units of analysis would be selected simultaneously following probability and purposive strategies. However, for a dependent sample, it could be rather burdensome for participants to take part in both strands, particularly in designs with an equal number of waves

(see Figure 1A and 1E). For independent samples, researchers can use information from an initial quantitative wave to recruit participants with certain profiles, but participants would be distinct. In other words, for independent samples, only the information of the other strand is used as recruitment criteria, but not for recruiting participants already involved in the other strand. [37]

MM sampling can also be nested when "different units of analysis are 'nested' within one another, such as schools, hospitals, and various types of bureaucracies" (ibid.). In this case, we refer to a multilevel sampling strategy. In our study, five head teachers agreed to participate in the study, and we then got in touch with the final year students with a request to take part in the qualitative panel in 2017. In 2018, we again contacted schools, but this time, we addressed all lower secondary schools in Vienna for the quantitative panel. Head teachers then passed on consent forms to final year students and their parents. This nested sample had practical advantages because the school served as a gatekeeper and cost-effectively contacted a high number of students. However, although cluster effects can be problematic, re-contacting and motivating participants after they had left school was a big challenge in our case. We hypothesized that participating in an institutional setting requires lower motivation than spending leisure time answering a survey. As a consequence, participation rates dropped severely from wave 1 to wave 2 when participants were in both strands (WÖHRER et al. 2022). [38]

Generally, drop-outs endanger not only generalizability but also plans to integrate and compare results across strands and waves. We have to accept refusals in any cross-sectional research, and in longitudinal research, the negative effect builds over time. The drop-out rate or panel mortality varies depending on the research topic and the target group. General population surveys might be less affected than projects centered on transitions. By definition, people are more mobile in transitional phases, and their life circumstances might change dramatically, which could affect their willingness or ability to participate in research. Transient groups are notoriously difficult to include in panel research (WARD & HENDERSON, 2003), yet longitudinal research is particularly rewarding in this area. [39]

Researchers generally report higher drop-out rates in QnLR than in QLR. For quantitative research, drop-outs are problematic for generalizability of results because most often we have to assume that missingness is not random. In contrast, for qualitative research, the generally lower number of cases, purposive nature of sampling, and the goal of tracing change (and continuities) on an individual level make QLR and the findings not more likely but more affected by panel mortality. Furthermore, *replacing* participants is (almost) impossible and even more effort is necessary to not simply retain the sample but "to 'walk alongside' participants and to sustain relationships with them over substantial periods of time" (NEALE, 2021, p.129). Another distinct and highly relevant feature of qualitative sampling is the dynamic process: In cross-sectional research, the criteria for inclusion may be changed or refined in the process of the study (i.e., theoretical sampling in grounded theory methodology). The

potential for dynamicity is hampered or in a trade-off with continuity and comparability across data collection points. As a consequence, the often-demanded openness and flexibility of qualitative approaches are restricted. [40]

4.2.5 Data collection methods

In MMLR, data collection methods in the qualitative and quantitative strands can be similar with similar bias (e.g., questionnaires and interviews) or distinct (e.g., artefacts and survey interviews). Furthermore, researchers can address the same or complementary (aspects of) a phenomenon or even different phenomena in one, multiple, or all waves with qualitative and quantitative strands. Thus, comparisons and integration can be made cross-sectionally and longitudinally. [41]

However, qualitative and quantitative researchers (partly) follow different logics. QnLR investigators have to employ the same measures across time to allow for longitudinal analysis, and one-off measurements only make sense for variables that cannot alter. However, with changing life circumstances, questionnaires might have to be adapted, as in a study on transition. In this case, researchers will most likely have to modify some questions or introduce new measures to cover the respective circumstances; for example, questions on satisfaction with school will be exchanged for questions on satisfaction with employment or university. [42]

QLR researchers have more flexibility in adjusting and specifying research questions according to new insights gleaned through the whole research process. In fact, the more respondents drive the data collection, the less problematic are changes in content or even methods. It is considered a strength of qualitative methods to be used with openness for respondents' sense-making. The same holds for QLR, at least to some degree. Minor adjustments in data collection methods, such as shifting from narrative interviews to problem-centered interviews or using network graphs as a supplement at the end or at the beginning of an interview (VOGL & ZARTLER, 2021), are unproblematic because integration and comparisons are still possible. Major changes, such as switching from interviews to artifacts or social media posts, could hamper a longitudinal perspective. [43]

The different status of standardization and consistency can lead to tension between the qualitative and the quantitative strand. Longitudinal research is always full of surprises—even more so in the qualitative tradition. But we can only attribute change to what we know, that is, the information we have received. Because processes or developments may not be clear before the research is conducted, some data collected in the first wave may turn out to be unrelated to the emerging process over time. As a consequence, "flexibility and responsiveness to the data and emerging analysis and interpretation is a key skill for the [longitudinal qualitative] researcher" (CALMAN et al., 2013, p.7). While this can be an advantage for methodological innovation and approaches that are most appropriate for participants and content, comparability may be weakened. Thus, researchers have to walk a fine line between standardization and

adjustment and be prepared to abandon ideas and take risks if necessary. Because MMLR in most cases requires synchronicity of different methods and methodologies, these decisions are even more crucial. [44]

4.2.6 Data analysis and interpretation

The main purpose for MMR is the value added through the combination of different methods. To reach this goal, some form of integration is needed. Generally, data analysis may be the most difficult step of all in MMR, especially when it is done in an integrative way (GREENE, 2007; HOLDER, 2018; ONWUEGBUZIE & COMBS, 2010; YIN, 2006). The challenge lies in developing a form of common analysis for different data types without losing their characteristics (MORAN-ELLIS et al., 2006). Naturally, there are different levels of integration. The simplest and most common form of integration is that of findings based on various strands in the conclusions (BAZELEY, 2009). Nevertheless, integration during the analysis is often described as "key to unfolding the complex relationships in the topic of study" (p.205). In the simplest form, illustrative quotes from qualitative data complement statistical results, "but this type of integration strategy is quite limited" (BAZELEY, 2012, p.817). BAZELEY distinguished five groups of integrative strategies: integration of results of separate components; one form of data informs the design of analysis of another; integration of data sources during the analysis; integration of more than one analytic strategy; and inherently mixed methods. [45]

The challenge of analysis—let alone integrated analysis—increases with longitudinal designs. Here, researchers take several steps—cross-sectional and longitudinal—and these steps can be organized integratively to different degrees. Unsurprisingly, PLANO CLARK et al. (2015) found in their meta-analysis of MMLR papers that "integration was minimal with authors simply analyzing and reporting the data sets separately and discussing both sets of results in the final discussion. Some authors made explicit comparisons between the two sets of results" (p.313). Based on the meta-analysis, the most common integrative strategy used was identifying groups with one data set and using the results for the analysis of the other data set. As an example, they used the study of HULT, WRUBEL, BRÄNSTRÖM, ACREE and MOSKOWITZ (2012) on disclosure of people with newly diagnosed HIV infection. In the qualitative analysis of three interviews with individuals with a recent diagnosis, the authors developed a typology of individuals' process for disclosing their HIV status to others. With their quantitative data, the authors identified differences among these groups. Of course, quantitative data can also be used to distinguish groups that are then further examined in the qualitative data. For example, SUÁREZ-OROZCO et al. (2010) established five academic performance trajectories with latent growth curve modeling. They then illustrated each trajectory with one in-depth qualitative case study (PLANO CLARK et al., 2015). [46]

Generally, the set of statistical analysis for longitudinal data is quite clear. In contrast, qualitative longitudinal analysis is less systematized. Thus, when it comes to MMLR, statistical analysis is often more elaborate and dominant. There

is no single established procedure in QLR, and data can be analyzed in multiple ways (VOGL, ZARTLER, SCHMIDT & RIEDER, 2018). But the multi-layered nature of QL data makes analysis very complex, and realizing the potential of data sets becomes extremely demanding (THOMSON, 2007). Researchers are methodological challenged by the volume of data in two ways: how to develop structure and focus, and how to develop a systematic approach to researching change (SMITH, 2003). I want to highlight two exemplary approaches. First, VOGL et al. (2018) suggested a step-wise procedure of comparisons to trace change in which cross-sectional profiling is followed by a longitudinal analysis. Second, researchers base longitudinal case histories (THOMSON, 2007) on case study-oriented biographical methods and reconstruct temporality in life courses. We can distinguish two dimensions framing the analysis: a temporal axis based on individual narratives and a social and special axis to complement the individual biography. Whereas VOGL et al. (2018) aimed for typology development, the aim of THOMSON's (2007) analytic strategy was thick descriptions of individual life courses between structure and agency. Both strategies could be integrated in a MMLR design to complement and expand quantitative results. Case histories can be used to illustrate but also enlarge the understanding of or types of patterns in time developed in quantitative analysis. The stepwise approach entails intra- and inter-case comparisons that are both cross-sectional and longitudinal. This strategy is well compatible with quantitative analysis and could lead to a typology based on a combination of qualitative and quantitative results. Qualitative results could be used to specify statistical models, and quantitative results to detect more general patterns. [47]

In our study, we developed a typology of patterns in time for the educational and occupational orientation process of young people at the school-to-work transition, using a grounded theory approach (KOGLER et al., 2023). We employed the typology to inform and complement latent transition analysis (LTA) of the survey data. With LTA, we identified 11 patterns of aspirations with important differences depending on social background (VALLS et al., 2022). The qualitative results were helpful for us to decide which variables to include in the model, how many classes should be specified, and how they could be interpreted. Social background and other demographic variables could not be sufficiently considered in the qualitative strand because of the non-probabilistic and small subsample. Thus, we used quantitative results to triangulate, complement, and expand qualitative findings. [48]

Conditional or event matrices can be helpful for MMLR (and QLR) analysis (BAUR, 2005; SALDAÑA, 2003). In its simplest version, the matrix consists of cases in rows and events (in a broad sense) in columns. Events could be turning points, decisions, historical events, or life events, but they may also be trajectories. By comparing cases and events, researchers can identify processes and patterns in time. These patterns can be entered in additional matrices to represent and analyze events on a higher order. The principal logic rests on comparisons of cases and cases across time. This matrix can be based on qualitative, quantitative, or both types of data and be of use in analyzing case-linked data sources "seeing both connections and contrasts for individual cases,

and then across the whole sample, with the goal being to identify patterns across the data" (BAZELEY, 2018, p.141). In traditional quantitative cross-sectional analyses, researchers read the event matrix column-wise in a variable-based approach. In most qualitative strategies, researchers look at the event matrix row-wise as case histories. Comparing sheets of such matrices can help investigators take a multivariate approach (BAUR, 2005), integrate qualitative and quantitative findings, and detect higher order patterns. [49]

PLANO CLARK et al. (2015) contended that researchers often neglect time in the qualitative analysis and only incorporate illustrative quotes or use basic thematic analysis. They noted that "[r]esearchers used visuals to display qualitative results, such as a figure of the emergent themes or tables listing illustrative quotes by themes, groups, and/or time points. No article included a figure that portrayed qualitative results over time" (p.312). In other words, there is room for innovation and improvement in MMLR. For this, we have to address the lack of practical strategies for analyzing qualitative longitudinal data and for integrating quantitative and qualitative strands with respect to time and temporality. [50]

An effective strategy for presenting MMR data can be the use of joint displays or other visuals to facilitate integration by bringing different data types together. This strategy is also promising in longitudinal research to convey time aspects of the research (PLANO CLARK et al., 2015). Joint displays can take different forms, such as a comparison of convergent and divergent results side-by-side; a side-by-side display of merged quantitative and qualitative results, structured by the research questions, theory, categories, typology, themes and so on; or a matrix of qualitative and quantitative as two separate dimensions as a statistics-by-themes display (BUSTAMANTE, 2019; GUETTERMAN, CRESWELL & KUCKARTZ, 2015). These suggestions can be extended for a time dimension—in a sense, the cross-sectional snapshots are stacked up to a longitudinal history (e.g., see SAMMONS, DAVIS, DAY & GU, 2014). [51]

4.2.7 Research design as a process

As a final and concluding remark, I reflect on the overall research design in MMLR. Research in longitudinal studies is even more a "process of interpretation" (HOLDER, 2018, p.214) than in cross-sectional studies. In cross-sectional research, designs can be *fixed or emergent*—predetermined and planned at the outset of a study versus arising in response to issues developing in the course of a study (CRESWELL & PLANO CLARK, 2018 [2007]). In longitudinal research, an extra potential lies in the emergence of design (elements) over time. Research is designed both as "a response to and abstraction of dynamic processes. Data and analyses from one time point are built from and contingent on those from previous and future time points" (BAMATTRE et al., 2019, p.346). [52]

This reminds us of the fundamental principles of grounded theory methodology. The combination of grounded theory and mixed methods is relatively nascent but it is associated with a "meteoric rise in popularity" (GUETTERMAN, BABCHUK, HOWELL SMITH & STEVENS, 2019, p.180). It is particularly promising for

MMLR (CREAMER, 2022). Qualitative and quantitative approaches can be used to contribute to generating theory (CREAMER, 2018), and the principles of constant comparative method (CHARMAZ, 2014), recursive coding strategies (STRAUSS & CORBIN, 1998), and the inductive logic match well with MMLR. Constant comparison and recursive coding can be applied across cases but also across time, and theoretical concepts can emerge at any point and be used for decisions about focus, design, and subsequent phases in a project (CHRIST, 2007) or put the previous waves into new light. Thus, longitudinal research has an affinity to a recursive process. [53]

This is particularly true for QLR. It is not just impossible but also counterproductive to try and design QLR as fully operational at the outset. "By circumstance alone, designs will change in such work, and even the best-planned project will not, at the outset, be able to anticipate and accommodate what arises subsequently as newly emphasized areas of interest" (HERMANOWICZ, 2015, p.499). By planning to do so, researchers would ultimately stifle innovation and knowledge. In order to utilize the strengths of QLR in exploring change in depth, flexibility and openness in the research design are mandatory. Otherwise, the chosen time frame and tempo of the study might not match the momentum of the participants' lives (NEALE, 2019). Nevertheless, some continuity is warranted to maintain focus and comparability across time. This leads to a balancing act between flexibility and continuity. Crafting QLR in a way that reconciles this tension gives these approaches a distinctive edge (VOGL & ZARTLER, 2021). [54]

As a consequence, decisions about MMLR research designs should be continuously reflected and potentially altered. In our study we adapted the contact and incentive strategy continuously but also changed the qualitative interview format from a narrative to a slightly more structured problem centered approach (ibid.). Time frame and timing might have to be adjusted based on preliminary findings, priority of strands can change (HOLDER, 2018), and data collection methods and analytic strategies can be adjusted, without losing sight of comparability issues. CHRIST (2007) offered an example of how conclusions in an initial stage can be used to guide subsequent phases of a study, including the research question. What he calls a "recursive approach helped define important aspects and findings that would not have emerged if a linear model had been followed" (p.240). The absence of analytic closure (THOMSON & HOLLAND, 2003) is a result of the procedural character of longitudinal research and is perhaps the most challenging aspect of MMLR (see also BAMATTRE et al., 2019). It implies that new data in subsequent waves may change interpretations. The implications are that results can be contradictory not just between methods but also between waves. However, contradiction or dissonance (between accounts across waves, between methods or researchers, etc.) can be a starting point for further inquiry and have innovative potential (CREAMER, 2022). [55]

Qualitative methods are often employed in emergent designs and can even be called emergent methods (SCHREIER, 2017). However, combining a linear research logic with a circular one, in other words, combining quantitative and qualitative methods, can lead to none of the approaches being developed to its

full potential (WITT, 2001). In quantitative research, (formal) standardization is supposed to warrant comparability across cases, while in qualitative research, comparability through exploration and openness to substantial standardization is the focus (PALMIERI, 2017). However, adhering to standardization requirements results in limited openness (to some degree). Researchers see the strengths of qualitative research in the flexibility and openness that enable them to gradually approach the phenomenon researched, but in the longitudinal version, a certain degree of continuity is required for the sake of comparisons (VOGL, 2022). Cross-case and cross-wave comparability has to be warranted for the various levels of analysis in longitudinal research (VOGL et al., 2018). [56]

5. Discussion

The demands and promises are high in MMLR, but practical guidance is scarce. Consequently, expertise and methodological awareness are especially important. The dimensions or *decision points* mentioned above were used to illustrate the space of possibilities for MMLR. The well-known convergent, explanatory, exploratory, and embedded distinction of cross-sectional MMR designs (CRESWELL & PLANO CLARK, 2018 [2007]) needs to be seriously extended for MMLR. Nevertheless, the basic idea is still valuable: concurrent or sequenced (phases of) strands as well as priority and interdependence of strands. Expansion, complementarity, validation, initiation, and development, as well as follow-up and comparison rationales, can also be considered central in MMLR. Determining purposes affects the research design with its sampling, data collection, analysis, and interpretation strategies. However, the relation of design elements can change over the longitudinal course of the study, and the terminology soon turns out to be insufficient. With this contribution, I did not aim to offer a comprehensive design terminology, which would be an impossible task. Rather, I want to increase awareness for design options and interdependencies—without a claim for completeness. [57]

Beside its potential, MMLR is challenging. It is impossible and probably counterproductive to try and *plan* MMLR research at the outset. Researchers need to embrace change in multiple dimensions. Research questions can be changed or might emerge in the course of a study and as individuals' lives evolve. It has to be noted that the methodological foundations of qualitative and quantitative research might be in conflict in MMLR because openness and flexibility are considered to be of high value in QLR, while standardization and continuity are valuable in QnLR. There is a danger in detached and unintegrated strands in the course of MMLR. [58]

Another complicating feature is the *multi-dimensional and complex structure* of the data. The volume of data within and across time can be substantial and thus the time required for analysis (and data management) extensive. To identify changes and the process of change, researchers shift between methods and cases and across waves in the analysis. This leads to methodological challenges in developing a consistent structure and focus, and in creating a systematic approach for analyzing change and the underlying processes (SMITH, 2003).

How researchers conceptualize, measure, and include time in the analysis has to be clearly articulated (PLANO CLARK et al., 2015). Integrating quantitative and qualitative results could be in the form of merged patterns in time, typologies of patterns in time, or comparisons of results at different time points (ibid.). [59]

Another challenge is the *absence of analytical closure*, which THOMSON and HOLLAND (2003) and BAMATTRE et al. (2019) identified as one of the most demanding aspects of QLR. New data in subsequent waves can potentially render previous interpretations redundant or obsolete. Because of the continuous re-interpretation and re-examination of data involved in QLR, it can frequently be a difficult matter to find a natural and satisfactory end-point for the analysis of any given process. [60]

Change is omnipresent in MMLR. On the one hand, it is the main research interest, while on the other hand, it has implications for the research methods. Finding a balance between continuity (for comparisons across time) and flexibility (to honor the open nature of qualitative research and the need to adapt and respond to change in respondents' lives) is a demanding process. In many respects, QLR researchers tread a narrow path—more than QnLR researchers—and have to establish and maintain a balance between multiple factors: persevering in recruiting but exerting no pressure; maintaining continuity but being open to change; allowing flexibility but protecting rigor; placing value on closeness but keeping distance in the relationship between researcher/interviewer and respondent; and planning carefully but remaining open to unexpected opportunities (VOGL & ZARTLER, 2021). [61]

Change has potential, given the presence of flexibility and willingness to constantly reconsider research practice. Through careful continuous reflection on research practices, researchers conducting MMLR have to determine where and when changing the design is necessary, where continuity needs to be protected, and how to handle change outside researchers' control (ibid.). In other words, "be prepared but expect the unexpected" (SALDAÑA, 2003, p.16). [62]

With MMLR researchers have a very powerful methodology for exploring and explaining change and continuities. It is also a very demanding methodology in terms of resources and reflection, and longitudinal investigators face challenges that go beyond or magnify those of cross-sectional research. However, decisions on planning and conducting QLR should be informed by methodological research and reflection. We certainly need more of both to account for the specificity of research approaches, topics, and target groups. MMLR researchers would benefit from good practice examples with a thorough methodological description and reflection of MMLR research and guidance on reporting MMLR results, including visual and joint displays. In other words, there is room for innovation and improvement in MMLR. For this, we have to address the lack of practical strategies for analyzing qualitative longitudinal data and for integrating quantitative and qualitative strands with respect to time and temporality. [63]

Acknowledgments

I would like to thank Raphaela KOGLER and Franz ASTLEITHNER for their feedback when conceptualizing this contribution and the editors for the helpful comments and suggestions. This publication was supported by the Austrian National Bank (OeNB) under grant agreement number 18283 "When Dreams (Do Not) Come True" (Principal investigator: Susanne VOGL).

References

Abbott, Andrew D. (2016). *Processual sociology*. Chicago, IL: University of Chicago Press.

Adam, Barbara (2013). *Time and social theory*. Hoboken, NJ: Wiley.

Atkinson, Paul & Silverman, David (1997). Kundera's immortality: The interview society and the invention of the self. *Qualitative Inquiry*, *3*(3), 304-325.

Bamattre, Richard; Schowengerdt, Bethany; Nikoi, Acacia & DeJaeghere, Joan (2019). Time matters: The potential and pitfalls of using mixed methods approaches in longitudinal program evaluation. *International Journal of Social Research Methodology*, *22*(4), 335-349.

Baur, Nina (2005). *Verlaufsmusteranalyse: Methodologische Konsequenzen der Zeitlichkeit sozialen Handelns*. Wiesbaden: VS Verlag für Sozialwissenschaften.

Baur, Nina (2008). Taking perspectivity seriously. A suggestion of a conceptual framework for linking theory and methods in longitudinal and comparative research. *Historical Social Research / Historische Sozialforschung*, *33*(4), 191-213, https://doi.org/10.12759/hsr.33.2008.4.191-213 [Accessed: January 25, 2023].

Bazeley, Pat (2003). Teaching mixed methods. *Qualitative Research Journal*, *3* (Special Issue), 111-116.

Bazeley, Pat (2009). Editorial: Integrating data analyses in mixed methods research. *Journal of Mixed Methods Research*, *3*(3), 203-207, https://doi.org/10.1177/1558689809334443 [Accessed: August 3, 2022].

Bazeley, Pat (2012). Integrative analysis strategies for mixed data sources. *American Behavioral Scientist*, *56*(6), 814-828.

Bazeley, Pat (2018). *Integrating analysis in mixed methods research*. Los Angeles, CA: Sage.

Belli, Robert F. (1998). The structure of autobiographical memory and the event history calendar: Potential improvements in the quality of retrospective reports in surveys. *Memory*, *6*(4), 383-406.

Belli, Robert F.; Stafford, Frank P. & Alwin, Duane F. (Eds.) (2009). *Calendar and time diary: Methods in life course research*. Los Angeles, CA: Sage.

Bernardi, Laura (2021). Qualitative longitudinal research in family sociology. In Norbert F. Schneider & Michaela Kreyenfeld (Eds.), *Research handbook on the sociology of the family* (pp.107-124). Cheltenham: Edward Elgar Publishing.

Bernardi, Laura & Mortelmans, Dimitri (Eds.) (2018). *Lone parenthood in the life course*. Cham: Springer Open, https://link.springer.com/book/10.1007/978-3-319-63295-7 [Accessed: January 25, 2023].

Bidart, Claire; Longo, María E. & Mendez, Ariel (2013). Time and process: An operational framework for processual analysis. *European Sociological Review*, *29*(4), 743-751.

Bijleveld, Catrien C.J.; van der Kamp, Leo J.T.; Mooijaart, Ab; van Kloot, Willem A.; van der Leeden, Rien & van der Burg, Eeke (1998). *Longitudinal data analysis: Designs, models and methods.* London: Sage.

Burzan, Nicole (2020). Continuities and discontinuities. A methodological reflection on sociological analyses of time in multigenerational family interviews. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *21*(2), Art. 2, http://dx.doi.org/10.17169/fqs-21.2.3427 [Accessed: August 3, 2022].

Bustamante, Carolina (2019). TPACK and teachers of Spanish: Development of a theory-based joint display in a mixed methods research case study. *Journal of Mixed Methods Research*, *13*(2), 163-178.

Calman, Lynn; Brunton, Lisa & Molassiotis, Alex (2013). Developing longitudinal qualitative designs: Lessons learned and recommendations from health services research. *BMC Medical Research Methodology*, *13*(14), https://doi.org/10.1186/1471-2288-13-14 [Accessed: August 3, 2022].

Charmaz, Kathy (2014). *Constructing grounded theory*. Los Angeles, CA: Sage.

Christ, Thomas W. (2007). A recursive approach to mixed methods research in a longitudinal study of postsecondary education disability support services. *Journal of Mixed Methods Research*, *1*(3), 226-241.

Creamer, Elizabeth G. (2018). Enlarging the conceptualization of mixed method approaches to grounded theory with intervention research. *American Behavioral Scientist*, *62*(7), 919-934.

Creamer, Elizabeth G. (2022). *Advancing grounded theory with mixed methods*. London: Routledge.

Creswell, John W. (2014). *Research design: Qualitative, quantitative, and mixed method approaches*. Thousand Oaks, CA: Sage.

Creswell, John W. & Plano Clark, Vicki L. (2018 [2007]). *Designing and conducting mixed methods research* (3 ed.). Los Angeles, CA: Sage.

Cuervo, Hernán & Cook, Julia (2020). Understanding young lives through longitudinal research design. In Johanna Wyn, Helen Cahill, Dan Woodman, Hernán Cuervo, Carmen Leccardi & Jenny Chester (Eds.), *Youth and the new adulthood. generations of change* (pp.13-30). Singapore: Springer.

Elliott, Jane; Holland, Janet & Thomson, Rachel (2008). Longitudinal and panel studies. In Pertti Alasuutari, Leonard Bickman & Julia Brannen (Eds.), *The Sage handbook of social research methods* (pp.228-248). London: Sage.

Elias, Norbert (1978). *What is sociology?*. New York, NY: Columbia University Press.

Flecker, Jörg: Wöhrer, Veronika & Rieder, Irene (Eds.) (2020). *Wege in die Zukunft: Lebenssituation Jugendlicher am Ende der Neuen Mittelschule*. Göttingen: V&R unipress.

Flecker, Jörg; Wöhrer, Veronika & Schels, Brigitte (Eds.) (2022). *Junge Menschen gehen ihren Weg: Längsschnittanalysen über Jugendliche nach der Neuen Mittelschule. Göttingen*: V&R unipress.

Greene, Jennifer C. (2007). *Mixed methods in social inquiry*. San Francisco, CA: Jossey-Bass.

Greene, Jennifer C.; Caracelli, Valerie J. & Graham, Wendy F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis*, *11*(3), 255-274.

Guetterman, Timothy C.; Creswell, John W. & Kuckartz, Udo (2015). Using joint displays and MAXQDA software to represent the results of mixed methods research. In Matthew T. McCrudden, Gregory Schraw & Chad Buckendahl (Eds.), *Use of visual displays in research and testing. Coding, interpreting, and reporting data* (pp.145-176). Charlotte, NC: IAP.

Guetterman, Timothy C.; Babchuk, Wayne A.; Howell Smith, Michelle C. & Stevens, Jared (2019). Contemporary approaches to mixed methods-grounded theory research: A field-based analysis. *Journal of Mixed Methods Research*, *13*(2), 179-195.

Henwood, Karen & Procter, Joanne (2003). The "good father": Reading men's accounts of paternal involvement during the transition to first-time fatherhood. *The British Journal of Social Psychology / the British Psychological Society*, *42*(Pt 3), 337-355.

Hermanowicz, Joseph (2015). Longitudinal qualitative research. In Michael J. Shanahan, Jeylan T. Mortimer & Monica Kirkpatrick Johnson (Eds.), *Handbook of the life course* (pp.491-514). Cham: Springer.

Holder, Robyn L. (2018). Untangling the meanings of justice: A longitudinal mixed methods study. *Journal of Mixed Methods Research*, *12*(2), 204-220.

Holland, Janet (2011). Timescapes: Living a qualitative longitudinal study. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *12*(3), Art. 9, https://doi.org/10.17169/fqs-12.3.1729 [Accessed: August 3, 2022].

Hult, Jen R.; Wrubel, Judith; Bränström, Richard; Acree, Michael & Moskowitz, Judith T. (2012). Disclosure and nondisclosure among people newly diagnosed with HIV: An analysis from a stress and coping perspective. *AIDS Patient Care and STDs*, *26*(3), 181-190.

Kelle, U. (2001). Sociological explanations between micro and macro and the integration of qualitative and quantitative methods. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *2*(1), Art. 5, https://doi.org/10.17169/fqs-2.1.966 [Accessed: January 25, 2023].

Kogler, Raphaela, Vogl, Susanne, & Astleithner, Franz (2023). Transitions, choices and patterns in time: Young people's educational and occupational orientation. *Journal of Education and Work*, Online first.

Kogler, Raphaela, Vogl, Susanne, & Astleithner, Franz (2022). Plans, hopes, dreams and evolving agency: Case histories of young people navigating transitions. *Journal of Youth Studies*, https://doi.org/10.1080/13676261.2022.2156778 [Accessed: January 25, 2023].

Kraus, Wolfgang (2000). Making identity talk. On qualitative methods in a longitudinal study. *Forum Qualitative Sozialforschung / Forum Qualitative Social Research*, *1*(2), Art. 15, https://doi.org/10.17169/fqs-1.2.1084 [Accessed: August 3, 2022].

Leech, Nancy L. & Onwuegbuzie, Anthony J. (2009). A typology of mixed methods research designs. *Quality & Quantity*, *43*(2), 265-275. doi:10.1007/s11135-007-9105-3

Lewis, Jane (2007). Analysing qualitative longitudinal research in evaluations. *Social Policy and Society*, *6*(4), 545-556.

Mayoh, Joanne & Onwuegbuzie, Anthony J. (2014). Toward a conceptualization of mixed methods phenomenological research. *Journal of Mixed Methods Research*, *9*(1), 91-107.

McLeod, Julie & Thomson, Rachel (2009). *Researching social change: Qualitative approaches*. Los Angeles, CA: Sage.

Miller, Tina (2005). *Making sense of motherhood: A narrative approach*. Cambridge: Cambridge University Press.

Moran-Ellis, Jo; Alexander, Victoria D.; Cronin, Ann; Dickinson, Mary; Fielding, Jane; Sleney, Judith & Thomas, Hilary (2006). Triangulation and integration: Processes, claims and implications. *Qualitative Research*, *6*(1), 45-59.

Neale, Bren (2019). *What is qualitative longitudinal research?*. London: Bloomsbury academic.

Neale, Bren (2021). *The craft of qualitative longitudinal research*. Los Angeles, CA: Sage.

Neale, Bren; Henwood, Karen & Holland, Janet (2012). Researching lives through time: An introduction to the Timescapes approach. *Qualitative Research*, *12*(1), 4-15.

Neves, Barbara B.; Dias de Carvalho; Diana, Serra; Fernando, Torres; Anália & Fraga, Silvia (2019). Social capital in transition(s) to early adulthood: A longitudinal and mixed-methods approach. *Journal of Adolescent Research*, *34*(1), 85-112.

Onwuegbuzie, Anthony J. & Combs, Julie P. (2010). Emergent data analysis techniques in mixed methods research: A synthesis. In Abbas Tashakkori & Charles Teddlie (Eds.), *Sage handbook of mixed methods in social & behavioral research* (pp.397-430). Los Angeles, CA: Sage.

Palmieri, Marco (2017). An innovative approach to pretest questionnaire. *Sociological Methods & Research*, *7*, 108-132.

Pettigrew, Andrew M. (1995). Longitudinal field research on change: Theory and practice. In George Huber & Andrew van de Ven (Eds.), *Longitudinal field research methods* (pp.91-125). London: Sage.

Plano Clark, Vicki L.; Anderson, Nancy; Wertz, Jessica A.; Zhou, Yuchun; Schumacher, Karen & Miaskowski, Christine (2015). Conceptualizing longitudinal mixed methods designs. *Journal of Mixed Methods Research*, *9*(4), 297-319.

Reichertz, Jo (2019). Methodenpolizei oder Gütesicherung? Zwei Deutungsmuster im Kampf um die Vorherrschaft in der qualitativen Sozialforschung. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *20*(1), Art. 3, https://doi.org/10.17169/fqs-20.1.3205 [Accessed: August 3, 2022].

Saldaña, Johnny (2003). *Longitudinal qualitative research: Analyzing change through time*. Walnut Creek, CA: Altamira Press.

Sammons, Pamela; Davis, Susila; Day, Christopher & Gu, Qing (2014). Using mixed methods to investigate school improvement and the role of leadership. *Journal of Educational Administration*, *52*(5), 565-589.

Schilling, Elisabeth & König, Alexandra (2020). Challenging Times – Methods and Methodological Appraoches to Qualitative Research on Time. *Forum Qualitative Sozialforschung / Forum*

Qualitative Social Research, *21*(2), Art. 27, https://doi.org/10.17169/fqs-21.2.3508 [Accessed: August 3, 2022].

Schoonenboom, Judith & Johnson, Robert B. (2017). How to construct a mixed methods research design. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 69, 107-131, https://doi.org/10.1007/s11577-017-0454-1 [Accessed: August 3, 2022].

Schoonenboom, Judith; Johnson, Robert B. & Froehlich, Dominik E. (2018). Combining multiple purposes of mixing within a mixed methods research design. *International Journal of Multiple Research Approaches*, *10*(1), 271-282.

Schreier, Margrit (2017). Kontexte qualitativer Sozialforschung: Arts-Based Research, Mixed Methods und Emergent Methods. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *18*(2), Art. 6, https://doi.org/10.17169/fqs-18.2.2815 [Accessed: August 3, 2022].

Shirani, Fiona & Henwood, Karen (2010). Continuity and change in a qualitative longitudinal study of fatherhood: Relevance without responsibility. *International Journal of Social Research Methodology*, *14*(1), 17-29.

Smith, Noel (2003). Cross-sectional profiling and longitudinal analysis: Research notes on analysis in the longitudinal qualitative study, "Negotiating transitions to citizenship". *International Journal of Social Research Methodology*, *6*(3), 273-277.

Strauss, Anselm & Corbin, Juliet (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Newbury Park, CA: Sage.

Suárez-Orozco, Carola; Gaytán, Francisco X.; Bang, Hee J.; Pakes, Juliana; O'Connor, Erin & Rhodes, Jean (2010). Academic trajectories of newcomer immigrant youth. *Developmental Psychology*, *46*(3), 602-618.

Teddlie, Charles & Yu, Fen (2007). Mixed methods sampling: A typology with examples. *Journal of Mixed Methods Research*, *1*(1), 77-100.

Thomson, Rachel (2007). The qualitative longitudinal case history: Practical, methodological and ethical reflections. *Social Policy and Society*, *6*(4), 571-582.

Thomson, Rachel & Holland, Janet (2003). Hindsight, foresight and insight: The challenges of longitudinal qualitative research. *International Journal of Social Research Methodology*, *6*(3), 233-244.

Valls, Ona; Astleithner, Franz; Schels, Brigitte; Vogl, Susanne & Kogler, Raphaela (2022). Educational and occupational aspirations: A longitudinal study of Vienna youth. *Social Inclusion*, *10*(2), 226-239, https://doi.org/10.17645/si.v10i2.5105 [Accessed: August 3, 2022].

van Ness, Peter H.; Fried, Terri R. & Gill, Thomas M. (2011). Mixed methods for the interpretation of longitudinal gerontologic data: Insights from philosophical hermeneutics. *Journal of Mixed Methods Research*, *5*(4), 293-308.

Vogl, Susanne (2022). Qualitative Panelbefragungen. In Nina Baur & Jörg Blasius (Eds.), *Handbuch Methoden der empirischen Sozialforschung* (pp.935-946). Wiesbaden: Springer VS.

Vogl, Susanne & Zartler, Ulrike (2021). Interviewing adolescents through time: Balancing continuity and flexibility in a qualitative longitudinal study. *Longitudinal and Life Course Studies*, *12*(1), 83-97.

Vogl, Susanne; Wöhrer, Veronika & Jesser, Andrea (2020). Das Forschungsdesign der ersten Welle des Projekts "Wege in die Zukunft". In Jörg Flecker, Veronika Wöhrer & Irene Rieder (Eds.), *Wege in die Zukunft. Lebenssituation Jugendlicher am Ende der Neuen Mittelschule* (pp.59-86). Göttingen: V&R unipress.

Vogl, Susanne; Zartler, Ulrike; Schmidt, Eva-Maria & Rieder, Irene (2018). Developing an analytical framework for multiple perspective, qualitative longitudinal interviews (MPQLI). *International Journal of Social Research Methodology*, *21*(2), 177-190, https://doi.org/10.1080/13645579.2017.1345149 [Accessed: January 25, 2023].

Ward, Jennifer & Henderson, Zoë (2003). Some practical and ethical issues encountered while conducting tracking research with young people leaving the "care" system. *International Journal of Social Research Methodology*, *6*(3), 255-259.

Wenger, G. Clare (1999). Advantages gained by combining qualitative and quantitative Data in a longitudinal study. *Journal of Aging Studies*, *13*(4), 369-376.

Witt, Harald (2001). Forschungsstrategien bei quantitativer und qualitativer Sozialforschung. *Forum Qualitative Sozialforschung / Forum Qualitative Social Research*, *2*(1), Art. 8, https://doi.org/10.17169/fqs-2.1.969 [Accessed: August 3, 2022].

Witzel, Andreas (2020). Qualitative Längsschnittstudien. In Günter Mey & Katja Mruck (Eds.), *Handbuch Qualitative Forschung in der Psychologie* (pp.290-303). Wiesbaden: Springer VS.

Wöhrer, Veronika; Vogl, Susanne; Schels, Brigitte; Malschinger, Paul; Mataloni, Barbara & Astleithner, Franz (2022). Methodische Grundlagen und Forschungsdesign der Panelstudie. In Jörg Flecker, Brigitte Schels & Veronika Wöhrer (Eds.), *Junge Menschen gehen ihren Weg. Längsschnittanalysen über Jugendliche nach der Neuen Mittelschule* (pp.29–56). Göttingen: V&R unipress.

Yin, Robert K. (2006). Mixed methods research: Are the methods genuinely integrated or merely parallel? *Research in the Schools*, *13*(1), 41-47.

Author

Susanne VOGL is professor of sociology at the University of Stuttgart with a focus on research methods. Her research agenda is centered on improving existing methods in social sciences and further developing techniques and methods. Based on her aim to contribute to a more inclusive research practice, she develops integrative strategies for data collection and methods of analysis. Professor VOGL's substantive fields of research include the sociology of deviance, children and young people, family, and life course.

Contact:

Prof. Dr. Susanne Vogl

Universität Stuttgart
Institut für Sozialwissenschaften
Abteilung IV: Soziologie mit Schwerpunkt sozialwissenschaftliche Forschungsmethoden
Seidenstraße 36
D-70174 Stuttgart, Germany

E-mail: susanne.vogl@sowi.uni-stuttgart.de

Citation

Vogl, Susanne (2023). Mixed methods longitudinal research [63 paragraphs]. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *24*(1), Art. 21, http://dx.doi.org/10.17169/fqs-24.1.4012.