Using Mobile Phones: Recording as a Social and Spatial Practice in Multilingualism and Family Research

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Abstract: Family spaces are considered deeply private environments—taking recording devices into the family home is thus usually not an easy task. And it is even harder to make speakers record themselves without the researcher present. In this article, I describe the development of a recording device for mobile phones as a device to be used in multilingualism research. I will look at how qualitative research data are produced through social, technical and spatial practices, and how the availability of certain technical features influences the possibilities of research in the family.

I am interested in understanding ways of organizing multilingual family life and as such, my research is situated in the field of family language policy. As part of an ongoing umbrella project on multilingual transcultural families (MultiFam), in my research I deal with families in Oslo who have been selected because they use both German and Norwegian in the family on a regular basis. Interviews, creative tasks and family recordings are among the methods used to collect data on the language ideologies of the parents, the language use in the family and the biographic experiences linked to languages of both parents and (pre-)school-aged children.

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1. Introduction

"I am waiting outside of a four-storey building, bicycle helmet in hand, and have just rung the doorbell. I have been here before and I am supposed to meet again with a multilingual family that participates in my project. The two adults have agreed for us to meet over the course of one year and they are willing to share thoughts about their family languages and, as is planned today, an occasional dinner. There is no answer to my ringing and I start to wonder if there have been delays on the bus. Then again, it seems highly unlikely to be left without a message in such a case. Becoming strangely aware of my role as an intruder, I hesitate to call. Then I wait some more and finally send a text. The door opens. I was expected. One of the children had turned the doorbell to silent, as had happened before. It is technicalities that sometimes interfere with research" [Fieldnotes, Spring 2017].

In my research I am interested in understanding ways of organizing multilingual family life, and as such I am situated in the field of Family Language Policy (FLP, FOGLE & KING, 2017) that I will describe further below. As part of an umbrella project on multilingual transcultural families (MultiFam), in my research I deal with families in Oslo who have been selected because they use both German and Norwegian in the family on a regular basis[1]. Interviews, creative tasks and family recordings are among the methods used to collect data on the language ideologies of the parents, the language use in the family and the biographic experiences linked to languages of both parents and (pre-) school-aged children. In this article I will focus specifically on one methodological aspect of the project, while a more concise description and an overview of the main results is given elsewhere (OBOJSKA & PURKARTHOFER, 2018; PURKARTHOFER & STEIEN, 2019). [1]

My main aim with this article is to understand recording as a practice in research on multilingual families and to think about the *technicalities* of research. The concrete moment to start such reflections was the development of a recording application for mobile phones as a device to be used in the family for multilingualism research. I begin in Section 2 with linguistic repertoires of speakers and their movement in private and public spaces in an increasingly mobile world, to understand how mobility may change social practices. I then present methodological considerations on recording, from a historical perspective and as a tool in multilingualism research in Section 3. Section 4 deals with technical and technological aspects of recording and how developing a specific mobile phone app addresses these. In the conclusions in Section 5, I write about scientific effects of the recording app and how the participants in my research evaluated its use. Having readers in mind who are active in qualitative research, I hope that this article also holds interesting thoughts on collaborating with software developers and how research technologies can be made to fit the challenges of social science projects. [2]

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1 Details on the project can be found here: http://www.hf.uio.no/multiling/english/projects/postdoc-projects/judithp/index.html [Accessed: January 13, 2019].

2. Making Private Family Spaces Public

2.1 Research in multilingual families / family language policy

Family language policy (FLP) researchers deal with language acquisition of multilingual children (LANZA, 2004), the organization of family life and languages inside and outside the home (DAGENAIS & BERRON, 2001; GAFARANGA, 2010), language ideologies and beliefs about languages (CURDT-CHRISTIANSEN, 2009; VAN MENSEL, 2016) and also aspirations and imaginations (PURKARTHOFER, 2017). Generally speaking, most FLP researchers answer questions of why and how caregivers choose to transfer what language(s) to the next generation and what language(s) children speak with siblings and older generations. Interactional data, which gives insights into language practices and the use of different linguistic resources is considered a very important part of FLP, however, it is less common than interview data, which is usually easier to obtain. As the vignette in the beginning of the text has shown, doing research with speakers always involves some form of entering their private lives. When it comes to family spaces, one is easily transgressing borders of the "too private" or else is constantly negotiating which form of contact is acceptable to participants and researchers. [3]

In my research, I am interested in the linguistic repertoires of speakers, encompassing languages and other communicative practices, developing over the lifespan as speakers interact, get closer to certain linguistic resources and find others less important, always linked to lived language experience with its affective as well as functional relevancies (BUSCH, 2017). Language practices affect repertoires as frequent use can build new competencies but also stress speakers if they feel that they need to use their weaker language for extended periods of time. Parents are often concerned with how children will manage to learn more than one language and connections between language practices and beliefs and aspirations are obvious. Most families in the project perceive German and Norwegian as rather close languages, seeing the resemblances, but they also want to distinguish the languages, both in their own use and in the practices of their children. These wishes are generally common among parents and recorded interactions can help to see how the ideas about language use are put into practice. [4]

Speakers, and in my case family members, are seen as transnationally active, i.e., moving between different contexts, maintaining ties to family abroad but also taking part in several cultural and media spaces (JACQUEMET, 2005). Their language choices are thus not limited to the home language (e.g., German) and the language of the majority (e.g., Norwegian). Other languages, mostly English but also French, Spanish and Italian, are important for the parents and through their involvement, some of them will also become important for the children. The families' linguistic repertoires belong to what PENNYCOOK has termed *mobile times,* where "communication occurs across what have been thought of as languages, [...] speakers draw on repertoires of semiotic resources, and [...] language is best understood in terms of social practices" (2016, p.212). This

transnational and multilingual reality presents itself as an interesting case, yet its complexity holds some challenges for research that I will come back to a little later. Among the most obvious are that data collection is likely to happen in different places, employing diverse resources, and that distinctions between private and public situations might by blurred. [5]

2.2 Language and spatial practices

Language practices seem to come naturally to speakers, but for a researcher, they are often complex to understand. Meaning is produced through different modes, and social practices produce "the spatial [that] is social relations 'stretched out'" (MASSEY, 1994, p.2). In social sciences and more recently in sociolinguistics, spatial practices have attracted attention, i.e., in PENNYCOOK's view of "Language as a Local Practice" (2010). [6]

GOFFMAN, as early as 1959, thought about spatial practices in his book on the presentation of self in everyday life and he proposed the distinction between front and back regions, terms that have been popularized as front and back stage. In the front regions, that can be imagined as a kind of stage, "a particular performance is or may be in progress" (p.134) and the presentation given there "will tend to incorporate and exemplify the officially accredited values of the society, more so, in fact, than does his behavior as a whole" (p.35) Front regions can thus be seen as an idealized impression and research has shown that in interviews and self-presentations, speakers are more likely to produce socially desirable language practices (LABOV, 1981, p.3). In my research, it might be practices, aligning with the explicit language ideologies, that are put in front when parents talk about strategies to support language learning or else evaluate their own language behavior. [7]

Other practices are rather hidden, less talked about and happen in what GOFFMAN termed "back regions where action occurs that is related to the performance but inconsistent with the appearance fostered by the performance." (1959, p.134) In family research, the apartment can serve as the back region where all members of the family prepare for their "performances" but this also incorporates practices that are less explicit and might even be evaluated not so favorably by the family. In line with the observer's paradox, researchers tend to see more of the front regions while being interested in "how people talk when they are not being observed" (LABOV, 1981, p.3). The vignette at the beginning of the text resonates with GOFFMAN's conclusion that "access to these regions is controlled in order to prevent the audience from seeing backstage and to prevent outsiders from coming into a performance that is not addressed to them" (1959, p.238) But luckily, access is sometimes granted because both kinds of data are relevant for research: the first kind or front region presents language ideologies and tells us about motivations and ideas, but the second kind or back region data is more salient in terms of interactional strategies and actual language use. Or, as CODÓ writes: "the analysis of speakers' real verbal productions may show them to be rather different from what actors reported them to be" (2008, p.159). [8]

3. Recording as a Research Practice—Methodological Considerations

3.1 Historical recordings

Recordings, even if one is tempted to think of them as relatively recent data, have been used in research for over one hundred years. I cannot give a comprehensive overview here but will attempt to give some illustrative examples. I suggest to think of recording as a situated practice, embedded in other research activities, linked to material and methodological considerations and changing over time. [9]

The first recordings for the sake of science that are still accessible stem from the turn of the 20th century. Early recordings allowed researchers to access spoken language from across the world but in the same collections, poets and celebrities were also recorded so as to conserve their voices for future generations. Several European cities have collections of early recordings, with the Phonogrammarchiv in Vienna, founded in 1899, and the Phonogrammarchiv Berlin, founded in 1900, being the oldest sound archives in the world. The historical collection in Vienna contains over 4,000 recordings of ethnolinguistic and ethnomusicological nature.[2] Recording equipment at that time was bulky and very expensive and it was a matter of delicate handling to conserve recordings. Still, the recordings already were *mobile* as they were made far from the linguists' offices, even on different continents. In 1911, following the Viennese example, linguist Ferdinand BRUNOT founded the first sound archive *Archive de la Parole* in Paris, now part of the Bibliotheque Nationale de France.[3] BRUNOT and his students traveled to villages in France and Belgium and recorded speakers of different ages talking about their life and also reciting poems or singing songs. In addition to the recordings, they collected brief biographies of the speakers, indicating place of birth, main interactants (and their dialects), education and profession. In relatively short time, they were able to collect a rather large number of recordings, driven by the pressure of having to rent an expensive car to carry equipment. They also recorded musical performances and festivities, that is performances from the front region. These recordings have been digitized over the last years and are made available in an attempt to render research data and archives public. For research on multilingualism they might hold treasures yet to be found. [10]

Early recordings were an expensive and difficult endeavor. Recording became easier later on, as the equipment became smaller and even more mobile. This development was in part responsible for what DURANTI (2003) called the second paradigm of research on language in US anthropology as it led to *sociolinguistics* in the 1950s and 1960s, a then newly found discipline that relied on recording as an important method in face-to-face interviews and participant observation. Doing research on social stratification and language variation, sociolinguists used recordings of interviews and interactions to look for speech patterns and linguistic

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2   For details see https://www.oeaw.ac.at/en/phonogrammarchiv/phonogrammarchiv/history-of-the-pha/ [Accessed: January 13, 2019].

3   For details see https://gallica.bnf.fr/html/und/enregistrements-sonores/archives-de-la-parole-ferdinand-brunot-1911-1914 [Accessed: January 21, 2019].

features that were linked to certain social features (LABOV, 1981). The availability of handheld recording devices allowed the researchers to enter conversations more easily and to follow participants through their days, but the amplification of recorded material also meant that more caution had to be used in storage and access. [11]

In the sound archives, the development of technology can be seen in the changes of recording techniques, from cylinders to disques, to magnetic recordings in the 1950s and finally the beginning of digital recordings in the 1980s. Still, HOFFMANN claims that sound archives have been relatively neglected, with the exception of radio archives, as they are often "'buried' in archives assigned to specific disciplines and are thus understood to be, for instance, 'simply' example sentences in a particular language or specimens of non-European music" (HOFFMANN, 2015, p.74) While much can be said about how recording changed over time, I will now turn to how recording as a practice is relevant to my research project. [12]

3.2 Recording as practice in multilingualism research

Ethnographic research (HELLER, 2008; HORNBERGER & LINK, 2012) and research on language biographies (BUSCH, 2017), as most qualitative research, are linked by the search for an understanding of the complexities of realities and their aim is in general to find explanations that are relevant for speakers and societies. Validity is thus not gained by large numbers but rather by thick descriptions and the aim to understand even contradictory information.

> "The most serious argument for the role of experience in the historical and cultural sciences is contained in the general notion of *Verstehen*. In the influential view of Dilthey (1914) understanding others arises initially from the sheer fact of coexistence in a shared world" (CLIFFORD, 1988, p.35) [13]

DILTHEY (1990 [1905-1910], p.99) stresses the relationship between experience (*Erleben*), expression (*Ausdruck*) and understanding (*Verstehen*), which he sees as the initial interest of humanities. Learning about shared worlds can be facilitated by certain methods, meant to sharpen our view and to structure understanding. To find a framework for these kinds of multiple realities, I draw on LAW and URRY's understanding of the enactment of the social. They ask how we are forming the worlds we are investigating and highlight that "there are no innocent 'methods': all involve forms of social practice that in some way or another interfere with the patterns of the physical or the social. They are all part of that world" (2004, p.402). Effects of methods have been treated under the label of the observer's paradox or subsumed under reactivity effects. In the following, I will disentangle how different practices constitute one method, namely recording sound in family interactions and interviews. [14]

Within my research project, I use a set of different methods to inquire about the multilingual lives of speakers and families: the two main tasks were interviews with parents and caregivers, to capture experiences and interpretations, as well

as ideologies, and recorded interactions in the home and within the family setting to understand language practices and follow the language use of adults and children. Other methods include participant observation (some of which is also recorded), creative tasks for children and adults (i.e., to build their own environment with Lego building blocks or to draw their language portraits, see PURKARTHOFER, 2017) and occasional pictures taken in the family home. Many of these methods are at least partially built on recording talk. All of these practices are part of qualitative methods in multilingualism research and have been used and described elsewhere—but they are also, each time and for each family context, partly new practices which need explanations, might cause surprise or encounter resistance. I will only focus on recording as a specific practice here, but for all of the above, I consider a quote by HELLER highly relevant:

> "Some things can be recorded manually, in writing, by memory; some things require recording and more careful transcription, bearing in mind that like any other research technique, recording can be more or less familiar or more or less comfortable for different kinds of participants, and is therefore probably best begun once participants know you and have a sense of what you are doing" (2008, p.257). [15]

Through the eyes of a researcher in sociolinguistics and multilingualism research, and drawing on my own experiences, recording serves a number of different purposes. First and foremost it preserves language sounds for further investigation: whether we record word lists to collect phonological and morphological features or whether we record interactions to be able to listen to them again and again to follow the developments of sequences. CLEMENTE (2008) highlights the possibility to remind the immediate context of utterances and thus to revisit phenomena in naturally occurring speech. Secondly, recording serves as a way to complete observations through its degree of detail that no listener is able to retain at this speed. Validity is gained by being able to prove that utterances where produced "exactly like this"—at which point we see how the collection of data is very much linked to the production of data. Thirdly, recording research data involves choices about the scope of recordings, its frequency and the intended quality of sounds (differing greatly depending on the intended aim and scope of the research). The technical refinements range from employing easy-to-use compact recorders to highly specialized microphone systems that are able to imitate human hearing or focus on frequencies on the verge of human perception. In those cases, recordings are even adding auditory impressions that human researchers would hardly be able to hear. And of course, fourthly, recording as a practice has to deal with rendering immediate utterances durable: while speakers might talk about topics very freely, the knowledge that their voices will be kept for longer will generally have an effect on speakers. Some might feel more cautious while others might even make use of the recording device in the sense of a proto-media, i.e., as a means that might render their voice audible to a greater public. Addressing these issues with the participants is thus a necessary part of recording as a practice. [16]

Finally, the complex issue of recording as a shared social practice needs to be addressed. As in every research encounter, participants have different

experiences and different levels of knowledge, leading to them taking up different *social positions*. Yet, they meet to work towards a *shared* goal. When informing speakers about recordings, we still have to deal with questions of explicitness, of technical feasibility and degree of formality or artificiality. Thinking of recording studios, these are obviously the spaces most adept to recording sound and their insulations and equipment will provide means to trace even small acoustic divergences of speech. At the same time, asking speakers into these recording studios will most certainly inhibit their ways of speaking and, if they do not happen to be professional speakers or musicians, render them literally speechless for a while. Taking hand-held devices out on the street may thus seem the obvious counteraction and it is true that most speakers will feel less disturbed by small, almost invisible devices that are casually put on a table nearby. At the same time, these devices (even if their quality has improved dramatically in the last decades) are much more likely to capture sound bites that are not the main focus of the project. By recording speakers in what feels more like their natural environment, relaxed conversations are more likely to happen, even if these are not in the strict sense of interest to the researcher (LABOV, 1981, p.3). [17]

Planning recordings is thus a constant negotiation between the intended quality of the recordings and the concessions that are necessary in order to keep the conversations going. Talking about recordings in the family, these issues present themselves at each step: while it is relatively simple to accept the presence of a recording device when the researcher as a stranger is present, the device is becoming more "out-of-place" once she has left the scene and the family is again on its own. HELLER observed that "recorders do tend to get taken up as mechanical incarnations of the researcher; participants send you little messages whether or not you are there, some of which can be extremely interesting" (2008, pp.257-258) But then again, the recorder can take on a life of its own, when it "will be invited into situations that your body may be excluded from" (p.258). [18]

As was visible during my project, even devices that can be considered relatively simple are subject to a number of problems, from failing batteries to filled storage to problems of misplacing them "always when it would be a good situation" (Family interview, 2016). It usually takes researchers a while to get used to recordings practices (e.g., to record for a long enough time, to get close enough to speakers to have good sound, to be aware of background noise that renders recordings difficult), but most participants are not aware of many of those things. Thus, the experience of "just recording something" might turn out to be frustrating for researchers as well as participants. [19]

3.3 Post-recording practices: Privacy and Publication of data

Recordings are but one step along the way of a research project and issues regarding anonymity and recognizability of data need to be discussed with participants. Given that research in the family usually also contains data from children, their interests now and in the future have to be preserved. A lot has been written about ethical research with children in recent years (CLARK, 2011; ESSER & SITTER, 2018), which is why I will not go into more detail here.

Participants in qualitative research are made aware that they might take risks, by speaking in public but also by sharing private spaces with researchers as AKESSON, HOFFMAN, EL JOUEIDI and BADAWI (2018) reflect upon in the case of families living in refugee camps with very limited privacy. Some groups of speakers, including families, are more likely to be harmed by participation than others and it is those who are already most vulnerable and who run greater risks. [20]

For researchers, this means that recordings are never neutral and power relations are thus important when recording but also when using archives, e.g., in colonial contexts, with prisoners of war or when the roles of *informants* are obscured. While the first recordings in France were accompanied by meticulously kept records of speaker biographies, with the availability of quick and cheap recordings came the need to organize. As recorded material amplified over time, more caution had to be used in storage and access or else universities risked large sound archives lingering around without appropriate treatment. Transcription conventions and corpora of audio data were seen as one way to organize and to keep the large data sets accessible (LABOV, 1981). [21]

After all, research data are collected with the aim to understand something that transcends the immediate context of its production: we do recordings in one family not just to understand this situation but to learn about practices and patterns, maybe even strategies in place. Utterances in the family are thus private but at the same time produced (or at least recorded) for a broader public. Technology offers tools to record sound or images and to store information, and as with pen and paper for fieldnotes, we have to act responsibly regarding the material footprint of technologies (DEUMERT, 2014). The material footprint includes production and use of devices, the materiality of the contents and finally the earlier mentioned practicalities that make real bodies interact and be represented in research or not, depending on their political and socio-economic opportunities and constraints. [22]

Claiming technology by engaging in the development of research tools can offer easier ways in research and new ways of understanding but it also comes with the need for decisions regarding technical privacy issues and data security. In her book on sociolinguistics and mobile communication, DEUMERT writes about the issue of privacy in online and mobile communication:

> "people do not always consider their data public and can use such [publicly available] spaces to engage in fairly private conversations. It is here that researchers need to tread carefully. Privacy needs to be understood as contextual and emergent, and we need to evaluate each case on its own merits" (p.30). [23]

In the case of research in multilingual families, the researcher might be the only one who physically enters the family domain, but more people such as operators and data service providers can come into contact with data upon storage. Easier treatment of digital data thus demands new types of legal contracts and other measures to avoid data breaches through risky behavior. [24]

Finally, research data are collected to reach a scientific audience, through presentations and most likely by being included in publications. Questions about the how and why of anonymization need to be considered and, as was mentioned earlier, the wishes of participants need to be addressed. [25]

4. Mobilopptaker—Mobile Phones as Recording Devices

4.1 Recording as a technical challenge

After first experiences with family recordings in the project, and a number of failing batteries and unexpected behavior of voice recorders, the idea to rethink some of the technological issues presented itself. The main aim of the family recordings in the present project was to capture interactions within the family, including adults and children. Recording devices would thus be ideally close to the participants and relatively simple to manipulate—and they would ideally stay with the family for the whole project period of about one year. Audio recorders used in interviews were lent to the participants in the first weeks but they seemed relatively hard to handle for people not used to such types of devices. [26]

Necklace recorders, that have been successfully used in projects with children (CREESE & BLACKLEDGE, 2011), were not only expensive to acquire, they also demand a very conscious decision to put them on—something that was not always easy to achieve. At the same time, they do require changing of batteries and external data storage. As the families were asked to integrate their recordings into their family life, one of the main tasks was to search for something that was not considered complicated or annoying. [27]

Thus, by looking again at LAW and URRY (2004, p.404), "we shall need to alter academic habits and develop sensibilities appropriate to a methodological decentring. Method needs to be sensitive to the complex and the elusive." The authors highlight the necessity to develop methods that are better able to capture among others the *fleeting, distributed* and *multiple* aspects of a reality that is also produced through our use of methods. In our case, this meant to think along the lines of devices that parents already owned and which they already felt comfortable to operate. Among the major changes in household electronics in the last ten years was the introduction of smartphones, and the percentage of Norwegians having access to smartphones has increased from 57% in 2012 to 91% in 2017[4]. It was thus safe to assume that most participants would have access. Smartphones do possess all the features that are required of basic recording devices, they operate a microphone (even optimized for frequencies of the human voice), data storage and transmitting functions. And, almost as important, they are constantly recharged in the interest of their users and their presence on the coffee table or around the kitchen will not raise any attention by children or adults. [28]

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4   Statistics Norway, https://www.ssb.no/en/statbank/table/05244/tableViewLayout1/ [Accessed: January 13, 2019].

DEUMERT refers to ELLIOTT and URRY's term *miniaturized mobilities* (ELLIOTT & URRY, 2010) for mobile phones, tablets and lightweight laptops and stresses how they are "optimally designed for individual movement and portability" (DEUMERT, 2014, p.16) and how we experience "the integration of such devices into the very texture of our lives, making them an extension of our physical bodies" (p.18). I will come back to this question in the concluding section, evaluating if and how *mobile* recording practices developed with the use of smartphones and how this influenced recording as a practice. [29]

4.2 App development

After identifying a potential solution for the family recordings, the next step was the development of a suitable software solution. In cooperation with USIT, the University Center for Information Technology of the University of Oslo, we worked on the main functioning of a recording app, later called "Mobilopptaker," to be used in multilingual families. [30]

While smartphones were readily available, the applications that could be used to record were not. The aim was to develop a very simple service that would only be able to record and then send these recordings to one specific server at the university. It should be accessible to participants without training and in stark contrast to commercial recording apps, one of the necessities was to ensure full control over the collected data, which excluded the use of commercial cloud services and hosting in unspecified servers outside of Norwegian jurisdiction. [31]

The main functions of the app were built around the phone's internal microphone, optimized for frequencies of the human voice and the short-term internal data storage. Participants, having installed the app on their phone, choose an identifier and are then able to push one button to record (see Figure 1). The same button is pushed again, once the recording is finished, and a dialogue box opens to confirm the upload. The length of recordings is variable and tests have confirmed the feasibility of two hour long recordings, with upload times of less than one minute. However, most recordings in the family project lasted between 5 and 30 minutes. By confirming the upload, the participants are given a possibility to delete recordings that they deemed inappropriate for whatever reason (or that had served as test recordings). Lacking internet connection, the files are temporarily stored on the phone and can be deleted by the participants. Once internet connection is established, they are finally transferred via the phone's transmitting function and deleted from the participant's phone.
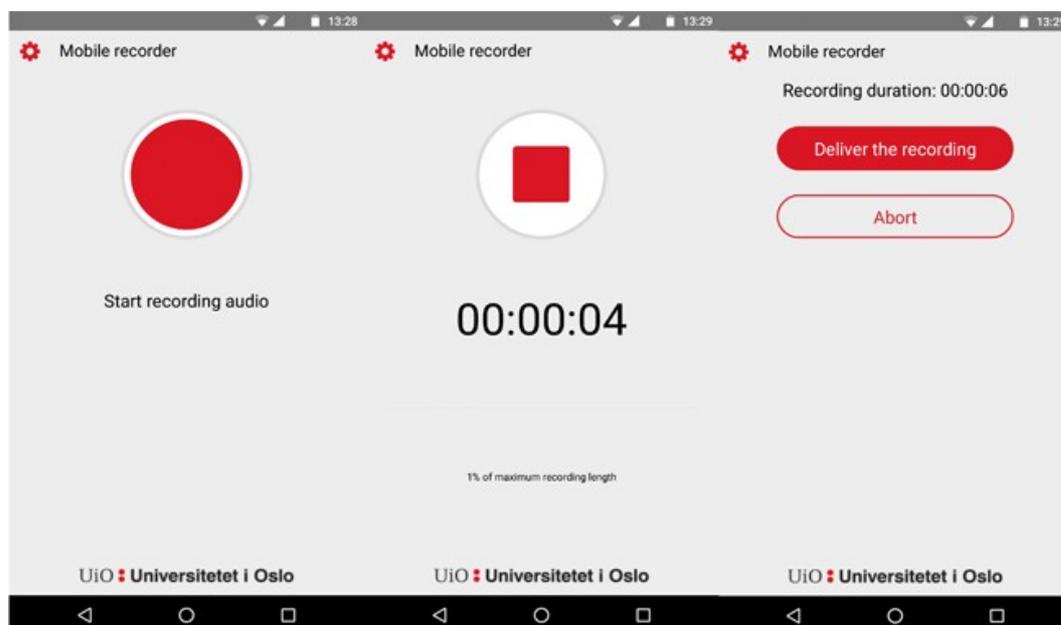
Figure 1: Screenshot: Start recording, stop recording and opt-in to transfer [32]

Innovatively, as a researcher, I was thus able to access the recordings minutes after they were sent by the participants. With the means of the Norwegian university IT infrastructure, routines were developed to transmit via an encrypted connection from the participant's smartphone to a dedicated server in the TSD infrastructure of the university[5]. [33]

The development of the app happened in close connection between the programmers and the researchers, and the challenges of finding feasible solutions to project requirements were met with patience from both sides. Slightly unexpected, the different operating systems on smartphones posed a number of problems, from distribution and installation to access to microphones and transmitting technology. The participants, willing to use the app, reported some issues and had to re-install new versions at some point. They needed some guidance through the process despite the generally good usability, and this also made it very obvious that continued support is needed independent of the technological means. Still, as an overall experience, the advantages outweighed the challenges for this project. [34]

For the MultiFam project, a version of the recording app was developed for Android phones and a year later, a version for iOS devices was published. About a year later, the USIT went on to develop a more generic version of the app called Diktafon[6], available to researchers to be used in contexts of their choice. [35]

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5 Tjenester/Services for Sensitive Data, https://www.uio.no/english/services/it/research/sensitive-data/ [Accessed: January 13, 2019].

6 A description of the app in Norwegian language can be found here:
https://www.uio.no/tjenester/it/applikasjoner/nettskjema/hjelp/tips-triks/diktafon.html [Accessed: January 13, 2019].

5. Research Design in Mobile Times—Outcomes and Conclusions

5.1 Modalities and outcomes of new technology

Regarding this specific project, I will return to the aims of the project and summarize how the *Mobilopptaker* held advantages for the researcher as well as the participants. Parents voiced their concern about having to physically take recordings to be collected and that carrying yet another device that asked for charging would be tiresome. These comments, during the very early stages of the development of the mobile app, worked as a reminder to keep looking for technological solutions in increasingly mobile times. Families have always been on the move, but with transnational experiences and mobile communication, their paths tend to get even longer. In this sense, the main advantages of the mobile app are linked to the presence on the participants' smartphones and to the possibility of transfer to the researcher. I will look at these elements in two steps. [36]

Being able to use devices that the participants already owned has implications for researchers and research projects that already begin with fewer costs for technical equipment. Even a large number of participants can use the same mobile app at the same time. Participant IDs are used to distinguish recordings from different families, whereas several devices can be used in one family. The delivery from the phones to the server is fully encrypted and complies with the standards of the treatment of sensitive data in Norway. As a researcher, it is easy to check whether new recordings were sent and if a reminder may be in order. Automatized reminders might be used in future projects to remind participants to record for example a certain time of day, or to randomly pick moments to ask participants to record "now." In this project, these options were not used, precisely because the main control over the recordings was meant to remain with the family members. Interacting via messages or reminders could of course increase the number of recordings but it could also lead to a feeling of being remotely controlled. [37]

Despite the advantages of smartphones, researchers have to make sure that possession of a smartphone does not become a prerequisite to participate in research: alternative modes of recording should of course be made available. In the families I encountered, and probably in Norway more generally, mobile phones are so widespread, that this was not an issue. While the first version limited transfer to WLAN connections, it soon became apparent that bandwidth was so cheap that transfer was done via mobile data as well. This was of course also an advantage of audio recordings, even with some hours of recording rarely growing beyond several MB of data. [38]

From the perspective of the participants, initially, trust was needed to install a mobile app on one's smartphone, as it is generally considered a private device. In that respect, this mirrors the moment of letting the researcher in to meet one's family. Once this relation was established, mobile apps offer several features that reduce fear and failure. The design of the app is reduced to one basic functionality and is relatively self-explanatory: there is one big red button, and this

app, in contrast to most sound recording devices, only serves one purpose. Ideas of including a replay function where discarded so as not to turn the app into a recorder/player, the same with giving a choice of where the files should be stored. With this version, the files are only sent to one agreed upon destination (the university server) and afterwards deleted from the phone. Including a replay function might also have increased the risk of participants becoming aware of their interactions and listening to them before sending them off, which could have led to more self-censorship. The option to send or delete was more used to abandon whole recordings (mostly in test situations). [39]

Developing technological tools to help with research is still not very common in the humanities and social sciences. Nonetheless, reflections about technological means of data collection, and in this case, recordings contribute to a better understanding of the processes one is involved in. In this sense, the recording app can be useful in teaching methodology and it can serve as a means to include interdisciplinary approaches in multilingualism research. In our case, the process was presented repeatedly, in training seminars for IT specialists as well as for researchers in the humanities—indicating that this kind of cooperation is still seen as newsworthy. In closing this section, I would just like to remind some of the challenges: scientific IT is still mostly concerned with the treatment of big data of the so-called hard sciences. For humanities and social sciences, different types of data are relevant and interpretative analysis asks for other ways of organization. Cooperation of researchers with developers and software engineers in these fields should be encouraged and can be very interesting but true interdisciplinarity and openness from both sides is needed to exchange about one's priorities and possibilities. Working together to understand research goals and means to achieve them can help to rethink technical solutions but just as well to find out how those solutions can make one's research environment run smoothly. In conclusion, much can be learned from these endeavors, both about one's own research and why it is important (and how it can be best explained), as well as about other fields, in this case about software design and opportunities of mobile apps. [40]

5.2 Concluding thoughts: Scientific aspects of mobile data collection

While technological innovations are appealing and can, also for researchers, feel like new toys, the final section of this article will address the scientific changes that the use of the mobile app brought about. As was mentioned earlier, recordings are collected in a constant negotiation between the intended quality of the recordings and the concessions that are necessary in order to keep the conversations going. The technicalities are thus linked to what we can think of as data but the data ultimately serve to answer our research questions or to explore what we consider to be a relevant field. [41]

In FLP research, the lack of interactional data is visible as the majority of studies build their findings on interviews, mostly with parents or other caregivers. In the course of this project, interviews and discussions with parents also played an important role, but the recordings in the family were centered around the children.

This was not explicitly demanded, but it seems that most parents interpreted *family interactions* to include children (and sometimes members of the extended family). In contrast to the recordings done with audio recorders, the children commented less on the recording process during the recorded interactions done with smartphones. It is of course possible that the first recordings have attracted more attention due to novelty, as the app was only introduced after some first recordings had already been made. [42]

The mobile character of the devices was reflected in the type of interactions that were recorded: in addition to family interactions around the dinner table (the prototypical interaction of years of sociolinguistic research), situations of play and reading-aloud, interactions were also recorded "on the move." These included dropping the child off at the pre-school, being on holiday with the grandparents or spending the night in a mountain hut. Again, the omnipresence of smartphones facilitates the momentary decision to press "record." In terms of interactions, this selection holds interesting potential as is includes the "in-betweens" of situations. In GOFFMAN's sense, these would cover typical back region behavior—as people are preparing to do something else. However, while the type of recording device will favor a certain selection, it is not likely to lead to completely different outcomes. Rather, the results of this study and its changed conditions of recording can inform future projects where the potential of mobile recordings can be addressed even more explicitly. [43]

Finally, there is one more advantage that serves researchers and families and that is the habituality of smartphones in the family. As it is the participants' phones, children and adults are used to having them around and they are generally not perceived as odd in the family. Given that they often also serve to take pictures or write messages, their presence is seen as an inevitable fact and they are usually also part of back region behavior in GOFFMAN's sense. [44]

While the phones might be known and perceived as not very interesting, there was one remark about the app that spoke about yet another aspect of technology in research: "I read about that new app at the university. And I was like: hey, I already know how that works, I've already used it. Cool!" (Parent, August 2017) For this parent, being curious and enjoying the status as an early adopter was a motivating factor to take part in research and to evaluate the research experience favorably. For other families, the symbolic capital linked to participation in research and the perceived performance of being a multilingual family can of course also contribute to GOFFMAN's front region behavior. [45]

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