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From Field Notes, to Transcripts, to Tape Recordings: Evolution or Combination?

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Abstract

For researchers doing qualitative research, interviews are a commonly used method. Data collected through interviews can be recorded through field notes, transcripts, or tape recordings. In the literature, there is a debate regarding which of these recording methods should be used. There are issues of reliability, cost (time and money), loss of data, among others. Technology plays a pivotal role in this debate. Indeed, new technologies (e.g., direct coding) are often seen as potential replacements for older technologies (e.g., transcripts), which leads to a debate that is based on an evolution narrative (from field notes, to transcripts, to working from tape recordings). This article argues that a combination narrative should be considered where combination is better than substitution. Moreover, combining the advantages of field notes, transcripts, and working from tape recordings without accumulating each method's disadvantages is possible because of new technology. To support this argument, two technological tools (OneNote and SmartPen) are presented as a way to increase the effectiveness, efficiency, and economy of qualitative data management.

Keywords: qualitative research, field notes, transcription, direct coding, technology, interviews

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Interviews are commonly used as a method of data collection under the naturalistic (qualitative) paradigm (Halcomb & Davidson, 2006), and this has been the case for quite a long time in the social sciences (Fasick, 1977). When conducting an interview, choices on how to "record" the data have to be made. One can decide to use field notes only, use a recording device, or both. If the interview is digitally recorded, one can decide to transcribe the interview, work from the tape recording, or both. To a certain extent, this choice has evolved in parallel with technological developments (Davidson, 2009). New tools, such as transcription software, allow researchers to create new forms of transcripts (e.g., multimodal transcripts, see Mondada, 2007) and to organize data in ways that would not have been possible a few decades ago (Crichton & Kinash, 2008). Nevertheless, there is no consensus as to how these tools should be used (Davidson, 2009), thus creating a need for more reflection on the act of transcribing.

This article contributes to the debate on the relationship between transcripts and technology (Davidson, 2009) and explores the different ways qualitative data can be handled. The article explores this debate from two different points of view. First, technology is presented through an evolutionary narrative, where methods have evolved from field notes, to transcripts, to working from tape recordings in order to improve data management. Underlying this narrative is the idea that transcripts overcome the weaknesses of field notes and that working from a recording overcomes the weaknesses of transcripts. Second, technology is presented through a combination narrative, where because of technology recording methods have evolved to a point where it is now possible to combine the strengths of field notes, transcripts, and tape recordings. However, while this produces a strong analytical object, it is also very cumbersome. In order to circumvent this difficulty and support the combination narrative, this article presents two technological tools that reduce the drawbacks of this combination. The result is a narrative that builds on the strengths of each method while reducing their weaknesses. Therefore, the suggestion is that to enhance the quality of data management in qualitative studies, field notes, transcripts, and tape recordings should be used together.

Epistemological Stance and Other Considerations

When it comes to data collected through interviews, questions are often asked as to what counts as data and when does the data analysis process start? There is no simple answer to these questions since this debate originates from different epistemological assumptions (Davidson, 2009). For some researchers, a tape recording is seen as data (Mondada, 2007) and therefore the transcript is a form of analysis (Duranti, 1997), while for others, the transcript is data (Ochs, 1979). This article is based on the postulate that the event itself, for example the interview, is not reproducible and that there is no going back (Ashmore & Reed, 2000). Hence, the data collection and analysis process can be separated in two key steps: the event itself (data collection) and everything that occurs afterward (data analysis). Since there is no going back to the event itself, researchers have to rely on analytical objects to do their analysis (Ashmore & Reed, 2000). These can be field notes, transcripts, or tape recordings. However, these objects are not the event itself. They are representations of the event (Green, Franquiz, & Dixon, 1997). As Button and Lee (1987) explain, "The data is naturally occurring conversation as a feature of social life, and the use of tape-recordings and transcripts is a practical strategy for apprehending it, and making it available for extended analysis" (p. 9).

Separating the event from the object also implies that transcripts are a form of analysis rather than data. The transcription process is a selective one reflecting the theoretical position rather than a mechanical selection and application of notation symbols (Davidson, 2009; Green et al., 1997; Lapadat & Lindsay, 1999; Ochs, 1979). The presence of subjectivity in the process of transcription implies that, even if there are no transcription errors per se, different authors with

different theoretical lenses will not necessarily agree on the content of a transcript and, therefore, there will possibly never be an agreement that one version is "correct" (Bucholtz, 2000).

It is also important to point out that there are different types of data analysis processes and the level of detail of the transcript will depend on the type of analysis being done (Halcomb & Davidson, 2006; Tashakkori & Teddlie, 1998). At one end of the spectrum, data analysis is done through extensive coding and theoretical development is achieved by establishing relationships between codes (Glaser & Strauss, 1967). This article is not written with this type of analysis in mind. Rather, the suggested approach is similar to that of Halcomb and Davidson (2006), and this article is written for interpretive data analysis for which data reduction and data display are crucial (Miles & Huberman, 1994). While the technological tools presented below could still be helpful when word-for-word transcripts are required, they might not be powerful enough to be useful if extensive coding is required. With this in mind, the next two sections will elaborate on the debate of interview data and the use of technology.

Technology to Promote Evolution Rather Than Combination

This section is based on an evolutionary narrative where new technology replaces old technology, because it is perceived as better. Hence, within this narrative, transcripts are supposedly better than field notes and working from tape recordings is supposedly better than transcripts. To support this narrative, the evolution of methods used is presented chronologically: field notes, cassette tapes and transcripts (with cassette tapes eventually replaced by digital files), and finally working directly from tape recordings. Video recordings do not have their specific section in this evolutionary narrative mainly because what is said about tape recordings is also true for videos. Although more information can be captured through video recordings than with tape recordings (e.g., stares, glances, etc.), this information still needs to be translated into text with the same difficulties as, for example, dealing with intonations of voice captured on tapes. Therefore, in order not to weigh down the discussion, they are deliberately kept out of the discussion.

The first method used to "record" interview data was field notes. Technologically speaking, before the event of portable recording devices, there were no other means of keeping a permanent record of the event (Davidson, 2009). Although new methods are now available, field notes are still used mainly because of their simplicity. Researchers can (a) use the on-site paper and pencil technique to identify and code data as the interview progresses and (b) add to these notes once the interview is over (Kieren & Munro, 1985). Hamo, Blum-Kulka, and Hacohen (2004) consider these two steps as two different types of field notes. The former is a chronological recording of events (White, 1980) taken during the event itself, which gathers information on context, nonverbal cues, and situational background. The latter is a historical recording of events (White, 1980), often taken shortly after the event, which is more interpretive and contains summaries of interviews and the researcher's impressions. Wengraf (2001) suggests that these notes should include the content of the interview as well as feelings and non-linguistic data. These scratch notes need to be transformed into proper, well-written field notes, as soon as possible while impressions are still vivid (Sanjek, 1990).

The main advantage of this method is that it is the most economical option in terms of time and money (Kieren & Munro, 1985). Moreover, field notes are also important because ideas and memories from interviews will most likely be lost further down in the research process. Indeed, soon after the interview, the brain will already be re-ordering the material and making connections within and outside the interview (Wengraf, 2001). Therefore, recording memories and ideas from interviews is essential for subsequent analysis (Wengraf, 2001).

Although it is simple, quick, and inexpensive, this method has several disadvantages, including that field notes cannot be replayed, that is the event cannot be encountered more than once (Ashmore & Reed, 2000). This leads to a loss of information and a loss of valuable details. Indeed, a study comparing different recording methods shows that half to two thirds of data is lost when using field notes alone (Kieren & Munro, 1985). Since researchers cannot replay the event to verify their field notes, these are often incomplete or biased. Thus, interpretations based on field notes are often too simplistic. Indeed, they allow only for the most coherent interpretation or the interpretation closest to the researcher's perspective to surface. This leads to the participants' perspectives being under represented (Hamo et al., 2004). Thus, Bertrand, Brown, and Ward (1992) argue that field notes should not be used alone unless the research question is very simple or time is very short. Other authors go further and reject this method when used alone, because it is not reliable enough (Button & Lee, 1987; Kieren & Munro, 1985).

Notwithstanding these disadvantages, for a long period of time this was the only method available to researchers. This changed with the arrival of portable recorders. The evolution of portable recorders can be separated into two chronological stages: (a) portable cassette recorders and (b) portable digital recorders. At first, it was not clear how cassette tapes would contribute to the research process. Indeed, Fasick (1977) expressed his doubts about this new technology and argued that

> The portable cassette recorder has failed to supplant paper and pencil recording of interviews in spite of the fact that it appears to meet the four essential criteria for any technological innovation in general survey research: technical efficiency as a data-gathering device, ease and simplicity of use, low per interview cost, and acceptability to respondents. (p. 549)

To explain this original failure, Fasick (1977) mentioned the cost and difficulties associated with transcripts. Indeed, although the equipment itself was quite cheap, the transcription process was not. Nevertheless, in the 1980s, transcripts were crucial because searching through cassettes was a cumbersome task and cassettes themselves were not permanent (i.e., tapes get damaged). Hence, producing a transcript was an essential step in translating recordings into searchable and analysable documents. To this effect, transcription techniques evolved and were refined to include as much information as possible in transcripts. Many notation systems were developed; the most used one was developed by Jefferson (Davidson, 2009; Slembrouck, 2007).

The invention of digital recorders made the transcript method even better for several reasons. First, digital files do not get damaged with time and backups are easily stored to ensure the integrity of the files. Thus, digital recorders provide unlimited "replayability." Second, software developed for digital sound files makes it easier to jump through interviews when searching for a specific excerpt. Hence, transcripts based on digital files allow for the data to be retrieved and examined in a more flexible manner (Heritage, 1984; Lapadat & Lindsay, 1999). Moreover, the accessibility of digital files means that recorded data can be reused and reanalysed in the context of another study because "the original data are neither idealized nor constrained by a specific research design or by reference to some particular theory or hypothesis" (Heritage, 1984, p. 238).

Although Fasick (1977) originally doubted the usefulness of transcripts, they are now used extensively (Davidson, 2009), with a wide range of possibilities as to how transcripts are produced whether the transcript is naturalised (writing that reflects words being said) or denaturalised (writing that reflects ideas being said) (Bucholtz, 2000). This is so, because transcripts have several advantages over field notes, one of which is the possibility of accessing, to a certain extent, the event itself in much more detail than field notes. As explained by Duranti

(1997), the ability to stop the flow of discourse allows researchers to focus on details, such as hesitations, restarts, and cut-offs in participants' speech (see also Hamo et al., 2004; Heritage, 1984; Silverman, 1993). Moreover, transcripts help prevent infatuation with the field, which occurs when researchers become too close to participants and their world, by providing physical and emotional distance between the researcher and the field (Hamo et al., 2004). Transcripts are therefore "an essential corrective to the limitations of intuition and recollection" (Heritage, 1984, p. 238). In short, transcripts are more complete and more reliable than field notes (Lapadat & Lindsay, 1999).

Transcripts, however, are not a perfect solution and have some problems such as cost and time as mentioned above (Fasick, 1977; Lapadat & Lindsay, 1999). Indeed, the amount of time required to produce transcripts is fairly important (Bertrand et al., 1992), and for every hour of taped interview, 6-7 hours of transcription is required (Britten, 1995). This time delay between the interview and the production of transcripts is a problem because it slows the progression of the research (Tilley, 2003). This is especially true when working with transcribers, who are, for the purpose of this article, people (other than the researcher) who have been hired to transcribe the interview (for more discussion on the use of transcribers, see Davidson, 2009). Voice recognition software, which can be used to aid the transcription process, are of limited help because they need to be trained to a single voice to be accurate and do not handle overlapping speech and background noise very well (Transana, 2012). At best, one can listen to an interview and repeat what has been said using voice recognition software, which will save time once the software has been trained. However, even then words can be wrongly translated into text because this technology is not completely accurate.

Another problem is that when translating an event into text, data is sometimes lost (Davidson, 2009). Although not all loss of information is a problem, for example loss of information resulting from theoretical positions (Duranti, 2006; Green, et al., 1997; Lapadat & Lindsay, 1999; Ochs, 1979) is a practical and theoretical necessity that prevents data overload (Duranti, 2006; Ochs, 1979), there are losses of information due to transcription that are critical. Indeed, emotional content, such as intonation, laughter, and silences can be captured by audiotape or videotape, but are difficult to convey through transcription (Poland, 1995). Notation systems help in this matter, but produce transcripts that are difficult to read and portray the interviewee as somewhat incoherent and inarticulate (Poland, 1995). More importantly, there can be a loss of data because of transcription errors (Poland, 1995). These errors are not interpretive choices. They are unambiguous mistakes due to fatigue, sloppiness, lack of familiarity with the subject material (e.g., when working with transcribers), and so forth. According to Easton, McComish, and Greenberg (2000), these errors are frequent enough that researchers should never assume a transcription was done correctly whether they did it themselves or used transcribers.

Errors can take different forms. First, errors can come from deliberate alterations of the data. For example, research shows that transcribers have deliberately changed the data to make it "tidier" (Poland, 1995) or more "up-beat" (Patton, 1990). Second, errors can come from accidental alterations of the data, whether from problems with sentence structure (e.g., using punctuation in a way that alters the interpretation of the text) (Easton et al., 2000; Tilley, 2003); failures to use quotation marks to identify paraphrasing, mimicking, or quoting (which results in the loss of valuable data, i.e., the interviewee is trying to pass as someone else); omissions (e.g., accidentally omitting certain parts of an interview); or mistaking words for others (which can potentially reverse the meaning of a sentence) (Easton et al., 2000). Third, errors can come from unavoidable alterations resulting from the difficulties inherent in the act of translating spoken words into text (e.g., modifications done for the text to make sense or because some information, such as context, does not translate well into text, see Poland, 1995). While there are several strategies to ensure

transcription quality and minimum loss of data, such as training transcribers and reviewing transcripts (MacLean, Meyer, & Estable, 2004; Poland, 1995), these can quickly become expensive and time-consuming.

Although there is certainly less bias and more information retained through transcripts than with field notes, this does not mean that errors and loss of information in transcripts are not important. Indeed, because of the perceived validity of transcripts as analytical objects, researchers trust them and do not seem to second guess them. As noted by Poland (1995), "systematic examination of transcription quality (whether of random samples or entire data sets) is probably more often the exception than the norm" (p. 291). Hence, mistakes in transcripts can have a serious impact on the data analysis process and lead researchers to reach incorrect conclusions (Easton et al., 2000; Poland, 1995).

While the adoption of the transcript method is an improvement in comparison to the field notes method, it creates new problems because transcripts are time consuming, costly, and can contain errors. Once again, the advancement of technology has provided an alternative to overcome these problems: working directly from tape recordings (i.e., digital sound files) or video files. Indeed, with software such as HyperResearch, researchers are able to code, classify, and annotate sound bites instead of transcribing interviews and then working with the resulting text.

The main advantage of working from tape recordings is that it is a lot faster than writing transcripts. Kieren and Munro (1985) found that working from the recording can be from four to thirteen times faster than when working from transcripts. In addition to being less time consuming, some authors have raised the argument that working from the recording could be more reliable (Halcomb & Davidson, 2006). Transcripts can facilitate the development of an audit trail, but their potential for errors does not make them the ideal analytical object for such a trail (Poland, 1995). Rather, it is suggested that cross-checking should be done directly from the original recording (Halcomb & Davidson, 2006). According to others, transcripts are unsuccessful attempts to fix on paper what is dynamic by nature (Ashmore & Reed, 2000). For these reasons, some authors hope that in the future, analyses will be done directly from recordings (Ashmore & Reed, 2000).

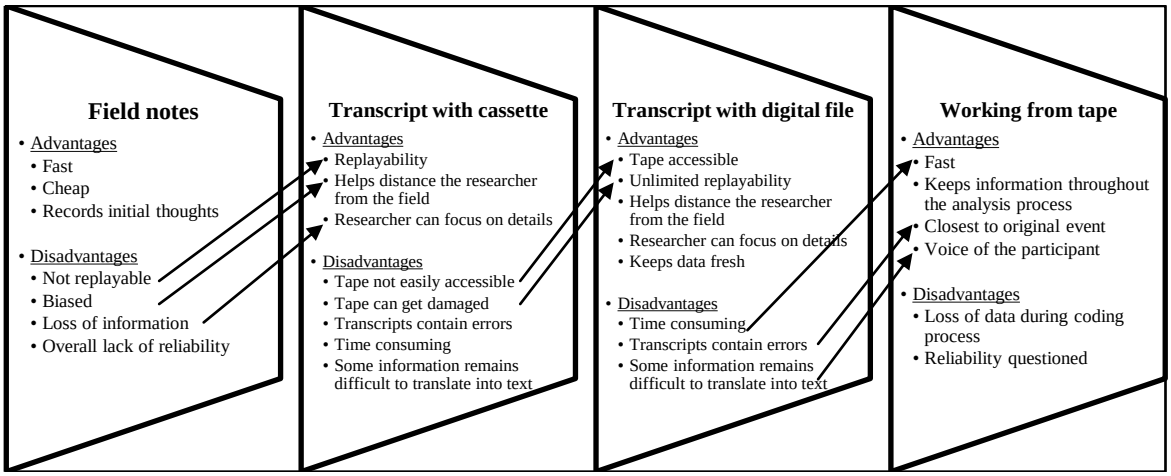
Similarly, Crichton and Child (2005) argue that clipping and coding directly from tape recordings is stronger and more authentic than transcripts. According to them, working from the recording better renders the voices of participants. Their reasons for arguing this are that the tape (a) allows researchers to hear intonation, passion, pauses, and inflections throughout the analysis process, (b) reduces the impact of transcription (loss of data through flattening into two dimensional text format), (c) keeps data "fresh and true," and (d) reduces risks of misrepresentation, transcription errors, and loss of context (Crichton & Childs, 2005). Working with tape also reduces both the time and costs associated with data management, which provides another advantage because it could lead to studies with more interviews, thus providing a more robust set of data. Indeed, Crichton and Kinash (2008) mention that since researchers spend a lot of their research budget on transcription, this influences the number of interviews that will be conducted. According to Tilley (2003), issues in the process of transcription mean that "researchers must consider the extent of detail necessary in transcripts when making informed decisions about appropriate transcription procedures" (p. 760).

Despite these advantages, some researchers do not believe that working from the recording is reliable enough to be used on its own. Kieren and Munro (1985) argue that this method leads to a loss of data ranging from 13% to 34%. Moreover, they note inconsistencies in category assignments when compared with transcription procedures. They conclude that this method is

sufficient for professional purposes only. Another argument against working from the tape is that audio recordings are not immediately available for analysis (Have, 1999). While Rice, Sell, and Hadley (1990) recognise the potential of online coding (e.g., reduced process time), they suggest that it should be used to complement standard methods.

To summarise, the different methods used to manage interview data can be explained through a technological evolution narrative as illustrated in Figure 1. Indeed, field notes, which had some reliability issues because of their inability to "replay" the event, were replaced by tape recording machines and, more specifically, the use of transcripts. Transcripts, which raised issues of their own such as costs and delays, were replaced by the technological possibility of using recordings to code data. While this has the potential to reduce some of the problems with transcripts, it is not clear yet if this is indeed a reliable method.

Figure 1. Evolution of Methods



One could argue that the awkwardness of working from the tape and the loss of data associated with this method derive from researchers' lack of experience with it. However, the transcription process was awkward when tape recording first appeared and, although researchers developed transcription abilities over time, the main issues raised by Fasick (1977) still remain a problem more than 30 years later. Transcripts are still costly and it is still difficult to render the complexity of speech when using text. Therefore, it could be argued that while researchers might become better at working from recordings, some of the present issues might not disappear. For this reason, rather than seeing technological advancement as a way to replace old methods with newer and better methods, a combination of methods has to be considered. The next section will present arguments for this narrative.

Technology to Promote Combination Rather Than Evolution

As described above, field notes, transcripts, and working from a tape recording all have disadvantages and it appears that there is not a single method that stands out as being perfect or better. In this section, it is argued that rather than seeing these methods as substitutes, they should be approached as complementary methods with each offering a different way of managing the data (Duranti, 2006). Therefore, the different methods will be discussed again, but with a specific focus on how they complement each other. Moreover, in this section, technological developments are presented as a way to facilitate combination rather than evolution.

First, from the combination point of view, the arrival of electronic devices should not be interpreted as the end of field notes (Duranti, 1997). Hamo et al. (2004) argue that combining field notes and transcripts provides a stronger analysis than if only one of the two methods is used because the combination provides both specific details (transcripts) and contextual elements (field notes), resulting in a more complete understanding of the event (i.e., the interview). To this effect, Halcomb and Davidson (2006) propose a six step approach that uses both methods. First, during the interview, the authors suggest that alongside the recording, notes should be taken to record impressions (rather than to record the content of interview). Second, immediately after the interview, thoughts should be written down to expand on initial field notes taken during the interview. Third, the tape should be listened to and amendments/revisions made to the field notes accordingly, making sure that these new entries are distinguishable from the initial ones (e.g., by using a pen of a different colour). The last three steps are concerned with the analysis itself and are as follows: preliminary content analysis, secondary content analysis, and thematic review.

Other authors suggest using tape recordings in combination with transcripts since each method has advantages that overcome the other's disadvantages. For example, transcripts improve on recordings not being readily analysable. Indeed, transcripts capture the data and translate it into an analysable written format (Have, 1999). Another advantage of transcripts over recordings is that they make speech readable, meaning that one can quickly read the interview rather than listen to it. Transcripts also allow for subtleties and specific details to be highlighted (Mondada, 2007). This might not be possible when working from the recording alone because some mechanisms used by participants to convey their point can only be identified through careful transcription of speech into text (Heritage, 1984). Moreover, Lapadat and Lindsay (1999) argue that transcripts actually help to make sense of the data:

> Researchers across disciplines for many years have found transcription to be an important component of the analysis process . . . . Analysis takes place and understandings are derived through the process of constructing a transcript by listening and re-listening, viewing and re-viewing. (p. 82)

Hence, it might be more difficult to make sense of the data when working directly from the recording. This is in line with Pomerantz and Fehr (1997) who argue that working only with tape recordings makes it difficult to study and isolate phenomena. On the other hand, tape recordings compensate for some of the transcript's weaknesses. For example, it is easier to evaluate the quality of the transcript when one can compare it with the tape (Pomerantz & Fehr, 1997), because recordings provide the evidence on which transcripts are based (Mondada, 2007). Moreover, as discussed earlier, it is argued that too much information is lost when working only with a transcript (Pomerantz & Fehr, 1997) and that recordings enrich conventional notations by making gestures, body position, and glances available, for example, when using video recording. Hutchby and Wooffitt (1998) also argue that, since the transcript is not data, it should not be used alone, but rather in combination with the recording. According to Hutchby and Wooffitt (1998), the transcript should only be a reference tool (p.74). This need for combination can be explained by distinguishing analytic utility (usefulness for analysis) from evidential utility (reliability); transcripts have stronger analytic utility than recordings, but recordings have more evidential utility (Ashmore & Reed, 2000). Thus, it is the link between both methods that produces their mutual intelligibility (Mondada, 2007).

Finally, Bertrand et al. (1992) suggest combining all three methods, that is, field notes, transcripts, and tape recordings, to differing degrees depending on available resources. First, while the interview is being taped, notes should be taken. Then, depending on the resources available (e.g., money and time), different uses can be made of the three methods. If possible, a

transcript is produced from the recording after the interview. This approach provides completeness (thanks to the transcript), keeps the data fresh for analysis (thanks to the recording), and provides context (thanks to field notes). Otherwise, another option is to listen to the tape right after the interview to expand on notes taken during the interview. Bertrand et al. (1992) suggest using this method when resources are scarce and results must be produced in a short period of time; this combination saves time while retaining all the essential points of the discussion. However, the main problem is that this method is even more selective than transcription in the sense that even more choices are made as to what is transcribed in notes and what is left out.

While recorded material and transcripts have coexisted since researchers started using tape recording devices, it is the recent technological advancements that make a true and "in real-time" coexistence possible. Indeed, alignment software such as Transana allows for the production of a link between the transcript and the tape. Transana is used to analyse and to manage audio/video data as well as to create transcripts. It offers the advantage of having access to the video/audio file and the transcript in the same window. It also has the capability to link video/audio files with transcripts using time codes. Mondada (2007) presents this kind of technology as a means to promote multimodal transcripts. By offering the possibility to hear the interview while reading the transcript, it is argued that these technological developments may reduce the pressure on written notation while providing the ability to inspect the recordings even at the point when one is writing up the research (Slembrouck, 2007). This is important because even with well-trained transcribers, it is unlikely that errors or discrepancies can be completely eliminated (Poland, 1995).

The different tools available at the moment (e.g., Transana, NVivo, HyperResearch, among others) offer some nice possibilities with regard to combining field notes, transcripts, and tapes. For example, these tools can link sound bites or video excerpts to codes or transcripts provided that researchers manually include these links. However, they are, to differing degrees, still difficult to use, time consuming, not user friendly, and/or expensive. For the moment, while combining methods leads to a more complete database it is still a very cumbersome process. This is a major weakness of the combination narrative. Here again technology can help and the next section will describe two tools that allow for the combination of all three methods in a way that is inexpensive, easy to use, and not time-consuming. The result is a combination of the advantages of each method without combining their disadvantages.

Technological Tools to Support a Combination of Methods

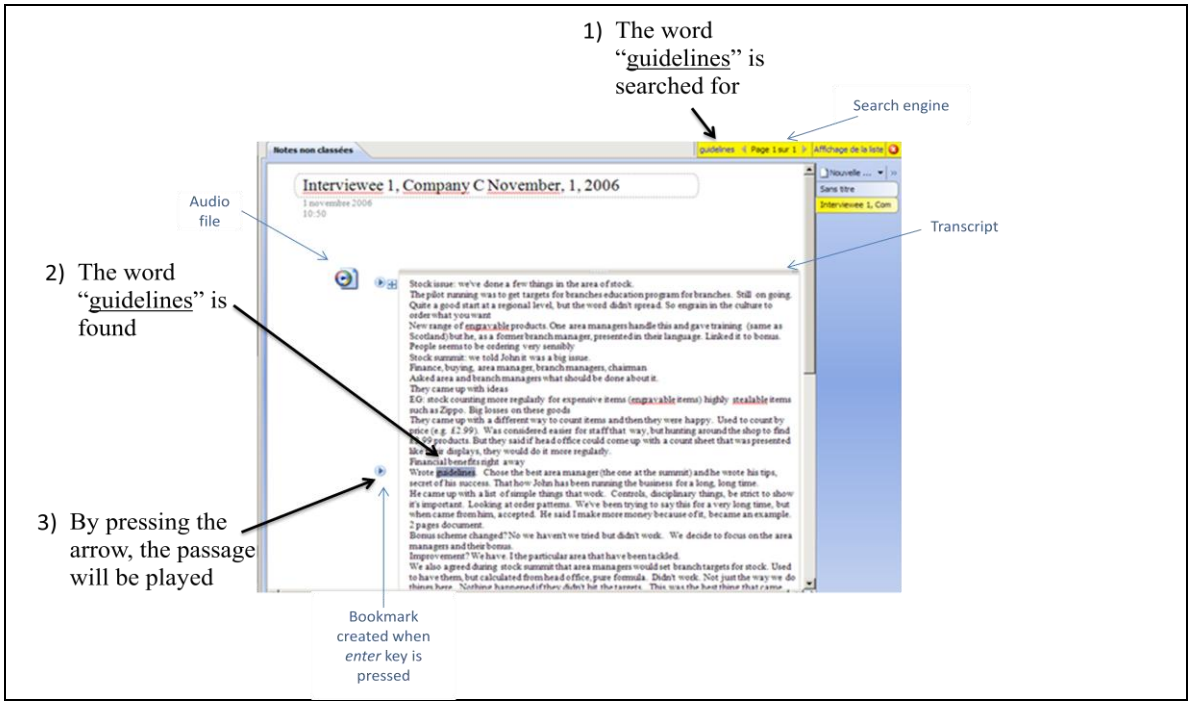
In this section two specific tools, Microsoft Office OneNote 2007 (hereafter OneNote) and the SmartPen, will be presented as a way to easily combine field notes, transcripts, and tape recordings. The intention of the article is not to promote these specific tools, but rather their capabilities. Any other tool offering the same kind of capabilities would be equally relevant. The capabilities of these tools support the combination narrative presented in the previous section because they reduce the main disadvantages of all three methods discussed so far while retaining their advantages.

The first tool is OneNote, which can be used for transcription and working from a tape recording. OneNote was not developed with research in mind. Rather, it is a virtual filing cabinet for digital data (e.g., audio files, PDF files, web pages, emails, etc.) developed to facilitate data management. This software is included in some Office 2007 Suites (and in all Office 2010 Suites for Windows). This in itself is an advantage because it does not require any additional cost if one has Office. Otherwise, it can be purchased at a low cost.

OneNote can help with data management because once an audio file is imported to a virtual notebook, it can be listened to directly in OneNote while taking notes or writing a transcript (see Figure 2 for a visual representation of the software's interface). The main advantage of OneNote is that linking what is being typed with the audio file is extremely easy, as opposed to using Transana. Indeed, while Transana can link text and speech, it requires users to insert time codes (bookmarks) manually as they type. In other words, users have to select a sentence in the transcript and then manually indicate on the audio file where the sound bite for this sentence begins and ends. This process has to be repeated every time a link is needed. To do this for a whole transcript is time consuming. In contrast, OneNote can do this automatically. Indeed, when the "Enter" key is pressed, a play button appears at the beginning of the line of text. A simple click on this play button will launch the audio file at the right place. Therefore, when a user hits the "Enter" key while transcribing the interview, say for example every other line, the end product is a transcript that is completely linked to the audio file. The same could be done with video files.

OneNote also includes a search engine that can look for key words. Hence, whenever one needs to hear a passage of an interview, but does not remember who said it or when the interviewee said it, all one needs to do is use the search function. Once the desired passage is found, it can be listened to by clicking on the play button (see Figure 2). OneNote will search for key words in all the interviews and will highlight every interview in which key words are found. Hence, the only thing that needs to be typed is the essence of what is being said, using key words and key expressions, because there will always be the possibility of listening to what was actually said. Whereas transcribing full interviews usually takes about one hour per ten minutes (i.e., six hours for an hour long interview), transcribing an hour long interview in OneNote takes approximately two hours (though this could be more or less depending on the level of detail in the transcript).

Figure 2. Transcribing Interviews with OneNote 2010



Another advantage of using OneNote is its ability to create hyperlinks between different parts of the notebook. Therefore, it is easy to create links between interviews when similar or contradictory evidence is heard. This can also be done with scanned corporate documents, web pages, and PDF versions of scientific papers, because OneNote supports all these file formats. Moreover, while OneNote is probably not the best tool for heavy coding, it can still manage simple coding. For example, it is possible to enter codes that will be linked to the recording as the interview is being listened to. This can be done in addition to the transcript or to replace it. Although OneNote is not as powerful as specialised software like NVivo and HyperResearch, its main advantage over these is its simplicity and affordability. It is easy to learn, and for users already comfortable within the Office environment, it may take only a few minutes to become acclimatised to the working environment.

To summarise, when using OneNote, the main disadvantages of transcripts can be reduced. First, it is less time-consuming since the original recording is always at hand, meaning the transcript does not need to be as complete. Second, transcription errors are less of an issue since verification is always possible. Third, although notation systems exist to capture things like tone of voice and laughter, the original recording is more informative and OneNote allows for easy access to this information. Thus, transcribing interviews in OneNote enables the researcher to get close to the data (i.e., it allows the researcher to get to know the data) while reducing transcription disadvantages. Finally, for researchers using transcribers, OneNote saves money and makes verifying the quality of transcripts easier.

While the previous section mainly focused on combining transcripts and tape recordings, the next section will focus on combining field notes with these two methods. As discussed previously, field notes have advantages over recordings and transcripts and should still be used. To this effect, OneNote could be useful, because it is possible to type notes as the interview is being recorded rather than after the fact. However, this has the disadvantage of having the computer between the interviewer and the interviewee. In this regard, another tool, the SmartPen, will be presented as a way of circumventing this problem.

The SmartPen consists of a simple pen- and paper-based notebook. The pen has a built-in microphone to record interviews, so it acts as a pen and as a digital recorder. (Ethical considerations require informing the interviewee of the pen's capability). However, its added-value lies in its capacity to link what is being written to what is being recorded. Without going into technological detail, it works with a built-in infrared camera that captures what is being written on dotted paper and links it to the recording. Thus, while recording the interview with the built-in microphone, any field notes written with the pen will be linked to what is being said. When the interview is finished, tapping on any written word with the pen will launch the audio file at the right place (i.e., what was being said when the note was taken), thus providing the opportunity to validate or to complete field notes after the interview. Moreover, any notes added after the interview, while listening to the interview playback, will also be linked to the audio file.

After, the interview, notes, and recordings can be transferred to a computer. The software that comes with the pen presents the notes exactly as they are in the notebook. Users therefore have a digital version of their notebook. It is also possible to create a personalized notebook to keep interview notes in an organized manner. Even when transferred onto the computer, the notes can still be read in combination with the audio recording. One only has to click on a word with the mouse to launch the recording. The software also has a search tool that can recognise handwriting and therefore it is possible to search key words through the written notes. Finally, the audio file is also available separately and can be imported into OneNote for transcription purposes if desired.

A final argument in favour of both of these tools is their usefulness for team work. Indeed, if more than one researcher is conducting interviews, it is possible to share data with other members of the research project. In team work, the links to the audio files become very important as each researcher can validate notes and transcripts by listening to the original interview. This reduces the risk of simplistic interpretations as evidence is only a tap away.

While the combination narrative described in the previous section is potentially cumbersome, accessible technologies such as OneNote and SmartPen provide an effective, efficient, and economic way of managing interview data, which brings out the best of each method, while minimising their problems. As Spiers (2004) argues, when it comes to linking transcripts and field notes with tape, simplicity is crucial. Indeed, as Spiers suggests, technology should not become an end in itself. Rather, it should remain a means to an end. Technology should work in the background as a way to improve data management, while letting the researcher do the analysis. This is precisely what OneNote and the SmartPen achieve. The technology is so simple it is not at the forefront of the research process. Writing with the SmartPen is the same as writing with any pen. Transcribing an interview in OneNote is the same as using any word processor. However, the object produced is a multimodal transcript (Mondada, 2007). Thus, introducing these tools to the combination narrative makes it very attractive for researchers.

Conclusion

The argument I have made in this article is that technological developments bridge the gap between field notes, transcripts, and tape recordings. First, impressions, emotions, and contextual details are recorded through field notes and can be validated by a simple tap of the SmartPen. Second, transcripts that provide detailed accounts of the interviews can be written in a quick and easy way with OneNote, while providing easy access to the tape for validation purposes. Finally, the incompleteness of transcripts and field notes can be overcome at all times with the possibility of listening to the recording to hear details that cannot (or at least not easily) be translated into text. Thus, technological advancements should be considered as a way of improving data management (combination narrative) rather than as a way of replacing older methods with newer methods (evolutionary narrative). Each method offers possibilities that the others do not and therefore should not be discarded because of new technological devices. Rather than debating which method is best, the focus should be on developing more complete methods of data management through a combination of methods.

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