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Abstract

Interviewing is a ubiquitous, although time-consuming, method in Outdoor Education research. Typical analysis requires a transcript of the entire recorded interview, on which a researcher creates and attaches codes to substantive sections. Qualitative software technology now allows the researcher to code directly on an audio-file (i.e. audio-coding), thus saving significant time. This article explains the differences between whole-interview transcription and audio-coding, while also comparing the strengths and weaknesses of each. The topic is examined via a detailed analysis of the available audio-coding literature and the author's own experience with Computer-Assisted Qualitative Data Analysis Software (CAQDAS) and audio-coding specifically. Although slow in adoption, audio-coding is now a viable and increasingly accepted form of interview analysis within the qualitative research community. Outdoor Education researchers should consider the use of audio-coding as it can significantly speed the efforts of our research while maintaining or exceeding the trustworthiness of our findings. Such increases in efficiency over time could result in more quickly building generalizable claims from increasing numbers of individual cases.

Keywords: Audio-coding, direct coding, interview analysis, interview research, transcription

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> Qualitative Interviewing has today become a key method in the human and social sciences, and also in many other corners of the scientific landscape such as education and the health sciences. Some have even argued that interviewing has become the central resource through which the social sciences—and society—engage with the issues that concern us" (Brinkmann, 2013, p. 1).

Introduction: Interviews, an Experiential Method

Interviewing is a ubiquitous method used in Outdoor Education research. Indeed, when one looks at the principal American journals associated with Outdoor Education, one finds the following. In the last four issues of *The Journal of Experiential Education* (*41*(2), *41*(3), *41*(4), *42*(1)), 10 of the 23 (43%) peer-reviewed articles used interviewing within their research design. Similarly, within the last four issues of *The Journal of Outdoor Recreation, Education and Leadership 10*(1), *10*(2), *10*(3), *10*(4)), five of the 20 (25%) peer-reviewed articles used interviewing. Finally, in the last four issues of *Research in Outdoor Education* (Volumes *13*, *14*, *15*, *16*), six of the 22 (27%) peer-reviewed articles employed interviewing. Thus, within current U.S. outdoor-related journals, interviewing represents a substantial portion of the qualitative data collection methods employed—and for good reason. Interviews "lend themselves most naturally to the study of individual lived experience" (Brinkmann, 2013, p. 47), accessed through the interviewee's thoughts, attitudes and feelings (Peräkylä , 2005, p. 869). The implicit respect and valuing of a participants' narrative creates an intimate and almost reverent event that encourages trust (Josselson, 2013 p. 103), which often results in an interviewee giving themselves fully to the method (Brinkmann, 2013, p. 28; Gillham, 2000b, pp. 7, 10). As many qualitative researchers know, interviewing can quite reasonably be called, a "methodology of friendship" (Kong, Mahoney & Plummer, 2002, p. 241), with no other method so consistently bringing rewards (Drever, 2003, p. 9). It is little wonder, then, that Outdoor Education researchers, are drawn to this method that privileges a participants' *experience*. For, an interview itself might be likened to an act of Experiential Education (Dewey 1929/1958, p. 4), where the interviewee is asked to reflect (Dewey's secondary experience) on an experience they've had (Dewey's primary experience).

Despite the centrality of interviewing within Outdoor Education research, it is not without its challenges: principally time (Carey, 2012, p. 89; Kvale & Brinkman, 2008, p. 115). Gillham (2000b, p. 9) estimates

that between trialing questions, preparing the interview schedule, conducting the interview, transcription, analysis, and write-up, a researcher will spend 50 hours for each hour interviewed. Such an investment is lamentable because it necessarily limits inquiry to fewer participants than researchers might wish. While much of this time investment is unavoidable, this may not be the case with transcription. Since all forms of research present a "tension between a need to gather as much rich data as possible whilst also being realistic about financial and time constraints" (Carey, 2012, p. 117), finding efficiencies (such as minimizing transcription) within the research process, provided they do not compromise rigor, allow researchers to allocate their time more productively.

The practice of transcription creates a written representation of a recorded interview, and is a technique common to all of the aforementioned articles (save Dorfsman & Horenczyk (2018) who do not indicate how they analyzed their interviews), and to the vast majority of interview research more broadly. This reduction of an oral conversation to text has been traditionally deemed a necessary step in interview analysis. For, a written facsimile of an interview has been required for a crucial aspect of the analysis process: coding. Through coding, substantive sections of an interview are assigned brief descriptive words or phrases, which aid in the eventual discovery of themes within the interviews. Thus, to code an entire interview, a researcher has needed a transcript of the entire interview. Although coding is an inevitable component of thematic interview analysis, technological advances now allow full-transcription of an interview to be potentially bypassed. Current Computer-Assisted Qualitative Data Analysis Software (CAQDAS) programs allow researchers to attach such codes directly to specific portions of the interview audio file (rather than to a transcribed facsimile). This technique allows the researcher to conduct the interview analysis BEFORE transcribing ONLY the necessary sections of the interviews that through analysis reveal themselves to be necessary for reporting/publication. Thus, in addition to minimizing time spent on transcription, "audio-coding" immerses the researcher in the actual recorded interview during the entirety of the analysis, rather than performing the analysis on a facsimile of the conversation. Such immersion makes audio-coding a distinct analytical advancement, rather than only a development in efficiency as speech-to-text transcription software (discussed later) promises.

Whether transcribing at the conservative rate of five hours for every hour interviewed (Gillham, 2000a, p. 62), or at a faster rate made possible by speech-to-text transcription tools, audio-coding side-steps whole-document transcription and transcribes solely the necessary portions of an interview, thus creating substantial time savings. If academic rigor could be main-

tained (or even eclipsed as I will argue), while decreasing the analysis time through audio-coding, more interview research could be conducted, which would mitigate against qualitative inquiries' most limiting factor: its lack of generalizability.

Although this technology has been available for nearly two decades, it has been slow to permeate the qualitative culture. Such sluggish adoption of available technology is typical of a careful research community, which wishes to ensure the quality of their work. However, technology continues to transform our practice and just as audio recordings revolutionized interview analysis in the 1970s, and the availability of CAQDAS programs in the 1980s and 1990s, it is predicted that audio-coding is a natural development in the evolution of the interview (Evers, 2011, Section 2.3).

While an article on interviewing as a method might seem better published elsewhere, it is to the Outdoor and Experiential Education field that I wish to speak directly. For reasons more clearly expounded in the conclusion of this paper, I understand audio-coding to be highly relevant to the evolution of our practice. To the aims of *Research in Outdoor Education* specifically, greater efficiency in qualitative research analysis directly impacts outdoor program assessment and thereby influences evidence-based practices amongst practitioners, educators, and apprenticing students in Outdoor Education. By alerting Outdoor Education researchers to accepted analysis techniques that increase efficiency, the *breadth* of our knowledge can accelerate, without sacrificing the *depth* for which qualitative inquiry is celebrated.

Traditional Interview Analysis: Whole Interview Transcription

Transcripts are associated with analytical rigor, because it is assumed that through conscientious transcription the interview will be faithfully represented through text (Bird, 2005, p. 240). The creation of a transcript includes: electronically recording an interview; deciding on a level of transcribed detail (e.g. will back-channel noises like coughs or emotional tones such as laughter be transcribed) appropriate for the research purpose; transcribing the interview either oneself or through a paid transcriber, often with the use of specific transcription playback software; re-listening to the interview while proof-reading the created transcript, and making any necessary changes (Rapley, 2012, p. 547).

The vast majority of contemporary qualitative methodology resources appear to assume whole-interview transcription as a necessary component of interview analysis (e.g. Creswell, 2014, pp. 194–204; Hahn, 2008, p. 76;

Maxwell, 2013, p. 105; Miles, Huberman, & Saldaña, 2014, pp. 5, 11, 46, 336; Rubin & Rubin, 2012, pp. 190–192; Seidman, 2014, pp. 79, 118–119, 133, 135–136, 164, 177). Some current and well-established texts seem to be antiquated and perhaps even unaware of current technological possibilities. For example, Creswell (2013, p. 175) recommends the use of high quality "tapes" for audio recording (!), and although mentioning ATLAS.ti, a notable CAQDAS program and a progenitor of audio-coding technology, he makes no allusion to audio-coding whatsoever (similarly see Miles, Huberman, & Saldaña, 2014 above). In one case, Magnusson and Marecek (2015, pp. 74–75) caution that "neither listening to an interview recording nor working from notes is sufficient. You must work with a written transcription that is a verbatim . . . record of what was said." Although this comment alludes to the availability of other techniques, Magnusson and Marecek offer no explanation as to why whole-interview transcription is solely sufficient.

As noted above, all (save Dorfsman & Horenczyk, (2018) who do not identify their analysis technique) the aforementioned articles, in the examined U.S. outdoor-related journals, employing interviewing as a method seem to assume the necessity of full-interview transcription (e.g., Bailey & Falk, 2016, p. 72; Bell & Ricker, 2016, p. 6).

Strengths of Whole-Interview Transcription

Several strengths have been traditionally associated with full-interview transcription. Hahn (2008, p. 78) and Josselson (2013, pp. 176–177) suggest that the slow process of accounting for the interview, word by word, allows researchers to immerse themselves in the data. However, perhaps the greatest advantage of whole-interview transcription is the searchability it allows (Evers, 2011, Section 4). It is common for a researcher to remember a specific idea or comment from an interview, but be unable to recall its location or interviewee. Reducing a conversation to digital text, allows the interview to be searched, thus providing an aid to the researcher.

A transcript also permits an interviewee to confirm its accuracy, thereby increasing the trustworthiness of the research (Drever, 2003, p. 61). Such "member checking" is enhanced by recent CAQDAS developments, which link transcripts to the audio file. That is, the researcher or interviewee can "click back and forth" between the audio file and the written facsimile. "The ability to synchronize the transcript with the original media file ensures the transparency and trustworthiness of the research process" (Paulus, Lester, & Dempster, 2014, p. 111). With that said, the trustwor-

thiness of the research should ultimately be judged on the fairness of how the interviews were coded, interpreted, and written-up—not merely on how the interviews were transcribed before the analysis began in earnest.

Although the above strengths are notable, I will later demonstrate how audio-coding meets or surpasses them, while avoiding the many limitations commonly associated with transcripts, which I discuss next.

Limitations of Whole-Interview Transcription

The most frequent criticism of transcription is that of its subjectivity:

> Further complicating the issue, some scholars highlight the subjective nature of transcription. Subtle elements within human communication (e.g. paralinguistics—pitch, volume, intonation) nuance meaning, elicit emotion, and resist reduction to a written form. Thus, in deciding how best to represent these subtleties, a researcher's "fingerprints" can be found throughout a transcript (Tilley, 2003, p. 752).

Social interaction is too complex to capture in its entirety, thus all transcriptions "should be considered partial representations, selective and situated in relationship to the goals of a particular study" (Paulus, Lester, & Dempster, 2014, p. 95). While some transcription of the interviewee's comments is inevitable (e.g. for publishing purposes), the concern here is that in whole-interview transcription, the reduction of the social interaction to text occurs BEFORE the analysis, rather than once the analysis is finished as is done in audio-coding. Indeed, Magnusson and Marecek (2015), who argued for verbatim whole-interview transcriptions above, caution that "sometimes you may benefit from listening again to a segment of an interview as you are doing the analysis. That also gives you the opportunity to add more details to the transcription of that segment" (pp. 74–75). If this is the case, why not just code on the audio-file, so that you ALWAYS return to the pertinent segments of the actual interview? In 2008, Poland similarly questioned the desirability of transcription in the interpretive process, noting that verbal communication does "not translate easily into text" (pp. 884–885). Using stronger language, Kvale and Brinkmann (2008) describe a transcript as "a bastard, it is a hybrid between an oral discourse . . . face to face . . . and a written text created for a general, distant, public" (p. 192). It is important to note that these scholarly criticisms are questioning the time-honored value of transcription not because of its time-consuming nature, but because it forces analysis from a partial and selective representation.

As noted earlier, transcription takes roughly five hours for every hour of interview. Even smaller case studies often include some 20 interviews thus creating an additional 100 hours of work. Such expenditure often requires contract researchers to "hire out" for transcription (Josselson, 2013, p. 176). However, such services further distance the researcher from the initial conversation. Remember that a justifying argument for the value of transcription is the slow process of accounting for the interview, word by word, which immerses the researcher in the data—hiring out for transcription or the use of speech-to-text transcription technology eliminates much of this justifying value. Further, such distance means "the researcher should check transcripts against audio recordings to correct any transcription errors, which is a lengthy process in itself" (Wainwright & Russell, 2010, p. 1; see also Bokhove & Downey, 2018, p. 10). Since time is a finite commodity, each small pre-analysis investment necessarily precludes time spent elsewhere on the research (Evers, 2011, Section 4).

If transcriptions, then, are only "partial representations," subjectively covered in the researcher's fingerprints, it is troubling to note that none of the articles I examined in the U.S. outdoor-related journals mention how transcription was approached, nor cite any of the growing literature highlighting the limitations of the transcription process. Further, consider the time invested in whole-interview transcription. As a thought experiment, I'll assume a conservative *n* of 15 for each of the 21 studies I examined. If each interview lasts an hour, typical of many interviews (e.g., Wigglesworth & Heintzman, 2017, p. 77), this equates to a minimum of 315 hours of interview time. Then, using Gillham's (2000a, p. 62) transcription rate of five hours for every hour interviewed, the total amounts to 1575 hours for transcription. Since researchers employing audio-coding will still need to transcribe any (read *only the*) relevant interview sections for publication purposes, some time for this necessary transcription must be subtracted from the 1575 hours above. Again, using Gillham's (2000a, p. 62) figures, if an average interview generates 18 pages and 6000 words, and a researcher using audio-coding transcribes, for publication, 15 sentences at 15 words each for every interview, this equates to less than four percent of each interview being transcribed. Thus, the audio-coding researcher avoids needlessly transcribing 96% of the interviews. If this four percent is subtracted from the 1575 hours above, the sum of unnecessary transcription now totals 1512 hours. In terms of a 40-hour work week, the researchers involved in these 21 articles spent a combined 37.8 weeks transcribing (in the judgement of a growing list of scholars (see below)) unnecessarily. Keep in mind that the calculations here are conservative, and only represent three journals' last four issues. Even so, 37.8 weeks represents more than a full-

time equivalent 9-month academic contract—although many faculty report work weeks that well-exceed the 40 hours per week used in this calculation (see Berg & Seeber, 2016, p. 19).

With the subjectivity of transcription now calling into question its assumed rigor, and its labor-intensive demands on time now well-established, a researcher might reasonably search for alternatives.

Modified Transcriptions

Evers (2011, Section 5.1.1) separates transcription into three different categories: Jeffersonian, Pragmatic, and Gisted. Jeffersonian is a well-established, highly-detailed, transcription system developed for conversation analysis. Pragmatic transcription is the form most-often used by researchers where the level of detail is matched to the theoretical needs of the research and what is permissible given available time and money. Although the detail may vary with pragmatic transcription, it is typically still a verbatim method. The third style of transcription, gisted, attempts to "get the gist" of an interview. Dempster and Woods (2011) state, "the idea of gisting is to create a summary transcript that captures the essence of a media file's content without taking the same amount of time or resources as a verbatim transcript might require" (p. 22). Where a verbatim transcript may take five hours, a gisted one could take only one or two. Paulus, Lester, and Dempster (2014) further differentiate two types of gisted transcription: "condensed transcripts," where "the transcript is condensed by removing unnecessary words and phrases, leaving a simplified version, but with exact words" and "essence transcription," which retains only a paraphrased version of the recorded data (p. 98). While gisted transcription holds some promise for interview research efficiency, it is even more vulnerable to the charge of researcher subjectivity.

One other proposed transcription efficiency is speech recognition software (Josselson, 2013, p. 192). Essentially, a computer program or web-based tool could process a digitally recorded interview and convert it into text. Although a review of the available automated speech recognition (ASR) software and services is beyond the scope of this paper, and perhaps futile given its constant evolution, Bokhove and Downey (2018) propose its merit for researchers committed to the transcription process. Noting that there is little literature available on the use of ASR in transcription processes (p. 4), these authors conduct several experiments with contemporary technology to determine available accuracy. They take for granted

that "transcription in the research process will always be a trade-off between available time or means, and the quality of the transcript" (p.3). They therefore posit that a responsible middle-ground between conducting one's own transcription (time-consuming) and paying for others (e.g. www.rev.com) to do it professionally (expensive) is to use ever-improving, free, web-based auto-captioning services (e.g., www.YouTube.com), which achieve accuracies that rival stand-alone software packages. Bokhove and Downey's (2018) results were that in one-on-one high quality recordings, users could expect accuracy surpassing 90%, when the automatically generated transcripts where compared to human generated ones (p. 10). Results dipped to around 68% accuracy in a single-microphone recording of a lecture in a busy classroom (p. 9). While recognizing that accuracy drops on all ASR with multiple speakers, differing accents, interrupted dialogue, domain specific vocabulary, and the quality of the recording, they conclude conservatively that a transcript can be generated within minutes (not including a two-hour wait time, which the researcher can allocate to other tasks) with 66–90+% accuracy (pp. 9–10).

Such advances in technology are certainly remarkable, and are already saving researchers substantial amounts of time. However, as Bokhove and Downey (2018, p. 1) assume from the outset of their paper, all transcription, no matter its origin, will likely require multiple rounds of edits as the researcher checks the transcript against the audio file (see also Wainwright & Russell, 2010, p. 1). Research conducted by Ranchal et al. (2013, pp. 305–307; see also Galletta, 2012, p. 121) suggests that such editing can be time-intensive.

These advances in transcription technology, though, may weaken the justification for transcription, for they decrease researchers' immersion in the interviews, thus distancing them from the recorded conversation. Given the limitations of transcripts noted in the previous section, and the further drawbacks of automatically generated transcripts described here, it would be natural to inquire if alternatives were available. CAQDAS developments have "sparked discussions among researchers about whether it is even necessary to transcribe media files prior to analysis" (Paulus, Lester, & Dempster, 2014, p. 111).

The Promise of Audio-Coding

Surprisingly, audio-coding technology has been available since 1991 (Fielding & Lee, 1991, p. 196), and recognized for its promise as early as 1996

(Kvale, 1996, p. 174). Gillham (2000b) similarly appeared comfortable with it in 2000 (p. 61). In fact, a growing number of scholars (Brinkmann, 2013, p. 62; Saldaña, 2016, p. 17; Wainwright & Russell, 2010), some within the field of Outdoor Education (e.g. Thomas, 2007, p. 104), are viewing audio-coding as a viable and integrity-filled alternative.

Such burgeoning support is to be expected when one considers the many benefits of audio-coding. However, before examining its many strengths, it may be helpful to provide a more detailed account of the audio-coding process. As a researcher listens (and re-listens) to each interview, she selects substantive audio sections and can simultaneously attach an open-code for each selection. As the thematic analysis deepens, a researcher is able to aggregate the open codes into broader axial and selective codes (essentially, themes and sub-themes made from the open codes; see Ezzy, 2002, pp. 91–92). It is important to realize that at any moment in this analysis process the researcher can click on a code (open, axial or selective) and immediately listen to the original portion(s) of the interview(s) connected to said code. This ability "to move swiftly between codes and audio excerpts," allows the researcher to "think analytically about the data while being immersed in the flow of the recorded interview, attending to utterances, silences, emotions and the interactive dialectic between interviewer and interviewee in ways that are difficult when reading even detailed transcriptions" (Wainwright & Russell, 2010, p. 3). Notice here that proponents of audio-coding are making the same argument for their technique that proponents of transcription cite for theirs: both techniques provide an immersive experience in the interviews. However, audio-coding uses the interviews themselves for the coding process, rather than a more distant facsimile (i.e. transcript).

Once the analysis has been performed and the themes and sub-themes identified, the researcher can then select the portions of the interviews that best represent each theme and only then transcribe that which will be used in publication. With some foresight, a researcher might have attached an additional "Quotable" open code to any audio selection that was particularly clear or articulate during the analysis phase. When it is time to write, the researcher could then perform a simple CAQDAS query, which would reveal all the quotable sections pertinent to a given theme. The researcher then need only click on each to again hear the interviewee's own words, and transcribe solely the one(s) that best suits the current need.

In addition to interview immersion, saving time through limited transcription, and aiding in the efficiency of the writing phase, audio-coding offers other pronounced benefits. However, these benefits are best explained as responses to the central criticisms lodged towards audio-coding.

The Proposed Limitations of Audio-Coding

Although audio-coding prides itself on time-saving through limited transcription, some (e.g., Fernald, 2001) have suggested that these savings are lost during the analysis phase when the researcher must continually re-listen to the interview in "real-time" speed. The thinking here is that it is far faster to read a created transcript than it is to listen over and over again to the interviewees slowly putting their thoughts together. Initially, this was a limitation of audio-coding. However, recent developments in CAQDAS programs (e.g. see ATLAS.ti 8) now allow the researcher to adjust the play-back speed of the audio recordings. Since speed reading rates can be as fast as 250–300 (see Pastore, 2015) words per minute and average speaking rates are 150 words per minute, reading can be twice as fast as listening. Fortunately, in a review of speech comprehension rate studies, Pastore (2015, p. 67) found that "compressed" or sped-up speech remained comprehensible to rates between 275–300 words per minute. Since clicking on a selected passage or a code within a CAQDAS program immediately loads the audio portion, such technological advances are closing the gap on this traditional advantage between text and speech.

A related proposed limitation is the cumbersome nature of navigating an audio file in comparison to the ease of scanning a transcription (Wainwright & Russell, 2011, p. 3). While I agree that using a mouse to play and pause, fast-forward and rewind an interview is clumsy and inaccurate, foot pedal technology has allowed far greater control of playback (see www.audiotranskription.de). Many CAQDAS programs now integrate foot pedal control directly into their interface (e.g. see ATLAS.ti 8).

As noted earlier, "searchability" of transcripts is a distinct advantage over audio-coding. However, this limitation is not as pronounced as it seems. For, audio files can also be annotated at the time of coding. By way of example, it is common to have an "interview schedule"—a list of questions the researcher intends to ask. When listening to the recorded interviews, the researcher could attach a note or memo directly to the audio file flagging, say, the beginning of question three, or, summarizing a long argument in just a short statement. These notes and memos can then be searched, allowing the researcher to find specifics within an interview, despite not having a full transcription (see Wainwright & Russell, 2010, p. 3 for similar sentiments). Interestingly, this may be a place where the automated speech recognition transcripts, discussed above, and audio-coding could join forces. If a researcher employing audio-coding is still struggling to locate an item within an interview, she might, using ASR technology,

create a "first draft," "good enough" transcript in minutes (Bokhove & Downey, 2019, pp. 1–2), in order to locate the idea.

Another critique of audio-coding is its inability to provide a transcript to the interviewee to check for accuracy. As I noted above, however, it seems far more important to check the accuracy of the codes, which directly lead to the findings. Since CAQDAS programs allow for a myriad of output formats, the researcher can easily export a document that highlights the selected sections of the audio file (e.g., from minute 2:25.6 to minute 3:10.2 of the interview) and the codes assigned to them. These documents and the recorded interview itself (assuming IRB and participant consent) can then be shared with a colleague who performs an audit on the codes to confirm the trustworthiness of the research (Guba & Lincoln, 1989, pp. 242–243). Similarly, if a researcher wishes to confirm the few transcribed selections that make it to the final draft of a publication, she could send the appropriate exported documents to each participant to confirm the transcription.

The last proposed limitations I found were in an article written by Evers (2011, Section 6.2.1) where she, a long-time qualitative researcher, experiments with audio-coding both on her own and in her classroom. Although she mentions several new criticisms—a laborious unintuitive number of mouse clicks, unappealing workflow in comparison to the use of transcripts, analysis process sped up too much, less immersion in the data, forgetting uncoded sections of the interview, and limited exportable formats—nearly all can be characterized as her customary practice, preferred learning style, or an unfamiliarity with the software. As to her sense that the analysis process was sped up too much, I can only reference the increasing number of scholars cited throughout the article who have not identified this as a problem. To the contrary, scholars (e.g., Wainwright & Russell, 2010, p. 3) have suggested that the immersive marination in the recordings themselves afforded by audio-coding allow the researcher to think analytically about the data while experiencing the flow, emotion and interchange between interviewer and interviewee in ways that would be difficult through transcription.

No doubt, whole-interview transcription and audio-coding have significant strengths and some limitations. However, I'm convinced that the many benefits of audio-coding described throughout this article make it a more efficient means of interview analysis than transcript-based practices. Seeking such efficiency is not a crude quest for speed, but a realistic recognition of the constraints scholars operate within. Interview-based research is known to be time-consuming (Kvale & Brinkman, 2008, p. 115), and many of the scholars conducting interview-based research within Outdoor Education are professors struggling to manage various responsibilities in the field and

classroom (see Berg & Seeber, 2016, p. 19). Therefore, if efficiencies can be made through audio-coding while maintaining rigor, or as some scholars posit, even deepening the interviewer's immersion in the data, thereby positively affecting analysis, such efficiencies should be considered. My belief in the efficacy of the audio-coding process rests not just on the literature cited here, but in my own research. Before transitioning to the conclusion of the article, I will briefly share my own experience using audio-coding for my Ph.D. dissertation (Stonehouse, 2011).

An Experience with Audio-coding

My dissertation topic centered around moral education within expeditionary learning. I used interviews to try and access the moral experiences of participants on an expedition. I accompanied 10 students and one other instructor on a two-week wilderness expedition and conducted two sets of interviews during the field experience. The first set of interviews explored the participants' own concepts of character. The second set of interviews explored how and whether the participants thought the expedition influenced their own character. At the close of the expedition, then, I had 20 interviews at roughly an hour each. This then meant that I was facing 100+ hours of transcription.

In preparing for the field research, I attempted to read broadly within the interview literature. I first encountered the notion of audio-coding within Kvale' s (1996, p. 174) *InterViews* text. Intrigued by the notion of saving some 100 hours of work, I pursued local qualitative research faculty for advice. Although none of the scholars I contacted had personal experience audio-coding, they all felt that the technique was trustworthy and that it could be defended in a methodology chapter. A fortunate encounter with Glyn Thomas, who had used a form of audio-coding in his own 2007 dissertation within Outdoor Education, encouraged me to investigate further. However, not wanting to rush in unaware, I decided to transcribe three interviews first, and then reevaluate. I created a transcription key to maintain consistency (see Bird, 2005, p. 240), and employed what DuBois, Schuetze-Coburn, Cumming, and Paolino (1993, p. 46) call a "broad transcription:" capturing the words verbatim, estimating pauses to be short, medium or long, and listing paralinguistic impressions (e.g. emphasis, emotion), while ignoring backchannel noises (e.g. hmm, uh-huh) and orthographic considerations (e.g., "nuculer"), which were irrelevant to my purposes.

During the transcription of these three interviews, I had a deep sense that I was not using my time as a researcher as effectively as I could. I found

myself transcribing long sections that I was nearly certain were tangential to the aims of the project. Admittedly, the process was immersing me in the interviews, but I felt that the audio-coding process would similarly allow me to work through the recordings, phrase by phrase, attaching codes as needed. After re-evaluating, I decided to try audio-coding, convinced that the hope of greater efficiency throughout my research career warranted the time investment necessary to learn the software. On the recommendation of several faculty, I choose ATLAS.ti as a CAQDAS program, which they had used to code transcriptions (most CAQDAS programs permit the input of multiple sources: documents, audio and video files).

Although by no means a techie, I found the program intuitive and rather straight forward. After working through a relatively brief tutorial, in a short while I was coding and making annotations on the audio files. My sense of the time-saving value of audio-coding was immediate. I used audio-coding for the remainder of the project and kept waiting to discover the limitations of the process. Literally, the only drawback that I found, alluded to above, was the one or two instances where I remembered an interviewee saying something pertinent, but could not remember who said it or in which interview (first or second) it occurred. On both occasions, however, I was able to remember pieces of the conversation and search for associated codes, and within a few minutes track down the relevant excerpts. Even this limitation could be further mitigated by occasionally adding descriptive codes to each interview as placeholders that index the conversations.

I was recently reminded of my own student-researcher journey while attending *The 2019 Canadian Student Outdoor Education Conference*. In a single day, I spoke with three different students who were conducting interview research—all of whom felt overwhelmed by the time-intense transcription process. Although none of the students had heard of audio-coding, they all were deeply interested. My sense is that audio-coding as both a concept and practice is an idea whose time has come. I now turn to the conclusion of the article and an appeal that audio-coding be more broadly adopted within Outdoor Education research.

Conclusion

Given the prevalence of interview-based research, it is curious that so little has been written, for or against, on the long-since-available audio-coding technique. Davidson, Paulus, and Jackson (2016) provide some insight, though:

> Individual qualitative researchers, such as any individuals facing a significant period of social and technological change, followed a variety of paths in their encounters with these new tools and possibilities. Some rushed to embrace them. Others tried tools selectively. Some are still reluctant or outright refuse to come to the party. (p. 606)

For those researchers in this last category, it does seem that the strengths of audio-coding delineated here at the very least warrant a trial investigation by qualitative researchers. Many CAQDAS programs that support audio-coding offer free trial versions of their software. As digital natives become researchers, it is likely that they will see the strong merits of audio-coding, and in-time it will becoming normalized.

Wainwright and Russell (2010) call the dogged commitment to transcripts, a "fetishised form of data," a "'knee-jerk' response to data creation" (p. 1). Citing other scholars, Wainwright and Russell (2010) explain this resistance noting science's bias towards sight and thus texts, and conclude recognizing that some degree of re-training will be necessary "to overcome our shortcomings and feel confident working in aural modalities" (p. 4).

Having earlier noted the relevance of interviewing to Outdoor Education research, I close the paper with one last strong appeal. Those working in the Outdoor Education field often do so because they're convinced of its value. Much of the time, their conviction is derived from their own anecdotal experience of being transformed through education in the out-of-doors, rich in experiential methods and philosophy. Most of these practitioners would like to see Outdoor Education become a greater part of education more broadly. Thus, they find themselves in a position where they need to prove Outdoor Education's value to colleagues or school boards. They look to research to help justify their arguments. Unfortunately, proving the value or effectiveness of Outdoor Education is a difficult and complex endeavor. Much like Einstein's quip, what we might wish to measure may not be measureable. For example, despite significant quantitative efforts to prove the transfer of learning between Outdoor Education programming and other contexts, findings remain at best ambiguous (see Brown's 2010 in-depth treatment of this subject). In contrast, qualitative interview research aims less to prove anything, than to give an account of someone's experience of something. For, transformational experiences are complex and resist reductionist attempts. Perhaps we must concede our universe's metaphysical limitations on our epistemology and humbly accept the authority of our participants' *testimomios* of their experience (Beverly, 2005). These accounts

of peoples' experiences could add up to a substantiating amount over time (e.g., see Lloyd, Gray, and Truong (2018) who employ interviewing through conducting "a case study to contribute to the growing body of scholarly literature concerning children and outdoor learning" (p. 53)). However, time is the limiting factor. Qualitative interview research is very time intensive, and this is why the efficiencies afforded by audio-coding are so important to our field. By streamlining the analytical workflow while simultaneously increasing the research's trustworthiness, audio-coding could assist in more quickly building generalizable claims from increasing numbers of individual cases (see Flyvbjerg, 2006, pp. 222, 224–225) or cases with a greater number of participants.

References

Association of Experiential Education (n.d.). *Our values*. Retrieved on 1/8/2019 from: https://www.aee.org/about-us

Bailey, D. L. & Falk, J. H. (2016). Personal meaning mapping as a tool to uncover learning from an out-of-doors free-choice learning garden. *Research in Outdoor Education, 14*, 64–85.

Bell, Brent J. & Ricker, Christa. When outdoor orientation program idioculture changes: Understanding student resistence. *Research in Outdoor Education*, *16*, 2018, pp. 1–23.

Berg, M., & Seeber, B. (2016). *The slow professor: Challenging the culture of speed in the academy*. Toronto, ON: University of Toronto Press.

Beverley, J. (2005). *Testimonio*, subalternity, and narrative authority. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (pp. 547–557). Thousand Oaks, CA: Sage Publications.

Bird, C. (2005). How I stopped dreading and learned to love transcription. *Qualitative Inquiry*, *11*(2), 226–248.

Bokhove, C., & Downey, C. (2018). Automated generation of 'good enough' transcripts as a first step to transcription of audio-recorded data. *Methodological Innovations*, *May-August,* 1–14.

Brinkmann, S. (2013). *Qualitative interviewing*. Oxford: Oxford University Press.

Brown, M. (2010). Transfer: Outdoor adventure education's Achilles heel? Changing participation as a viable option. *Australian Journal of Outdoor Education*, *14*(1), 13–22.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Los Angeles, CA: Sage Publications.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage Publications.

Davidson, J, Paulus, T. & Jackson, K. (2016). Speculating on the future of digital tools for qualitative research, *Qualitative Inquiry*, *22*(7), 606–610.

Dempster, P. & Woods, D. (2011). The economic crisis through the eyes of Transana. *Forum: Qualitative Social Research. 12*(1), Article 16.

Dewey, J. (1929/1958). *Experience and nature*. New York, NY: Dover.

Carey, M. (2012). *Qualitative research skills for social work: Theory and practice*. Farnham, UK: Routledge.

Dorfsman, M. I., & Horenczyk, G. (2018). Educational approaches and contexts in the development of a heritage museum. *Journal of Experiential Education*, *41*(2), 170–186.

Drever, E. (2003). *Using semi-structured interviews in small-scale research: A teacher's guide*. Glasgow: SCRE Centre, University of Glasgow.

Du Bois, J. W., Schuetze-Coburn, S., Cumming, S., & Paolino, D. (1993). Outline of discourse transcription. In J. A. Edwards & M. D. Lampert (Eds.), *Talking data: Transcription and coding in discourse research* (pp. 45–87). Hillsdale, NJ: Lawrence Erlbaum Associates.

Evers, J. (2011). From the past into the future. How technological developments change our ways of data collection, transcription and analysis. *Forum Qualitative Research, 12*(1), Article 38.

Ezzy, D. (2002). *Qualitative analysis: Practice and innovation*. Crows Nest, NSW: Routledge.

Fernald, D. (2001, April 02). *Coding interviews: Audio files vs. verbatim transcriptions*. Message posted to: http://forum.atlasti.com/archive/index.php/t-690.html. Retrieved on 01/08/19.

Fielding, N., & Lee, R. (1991). *Using computers in qualitative research*. London: Sage.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry, 12*(2), 219–245.

Galletta, A. (2012). *Mastering the semi-structured interview and beyond: From research design to analysis and publication*. New York, NY: NYU Press.

Gillham, B. (2000a). *Case study research methods*. London: Continuum.

Gillham, B. (2000b). *The research interview*. London: Continuum.

Guba, E., & Lincoln, Y. (1989). *Fourth generation evaluation*. Newbury Park, CA: Sage Publications.

Hahn, C. (2008). *Doing qualitative research using your computer: A practical guide*. Los Angeles, CA: Sage.

Josselson, R. (2013). *Interviewing for qualitative inquiry: A relational approach*, (1st ed.). New York, NY: Guilford Press.

Kong, T., Mahoney, D., & Plummer, K. (2002). Queering the interview. In J. F. Gubrium & J. A. Holstein (Eds.), *Handbook of interview research: Context & method* (pp. 239–258). Thousand Oaks, CA: Sage Publications.

Kvale, S. (1996). *InterViews: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage Publications.

Kvale, S., & Brinkmann, S. (2008). *InterViews: Learning the craft of qualitative research interviewing* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Lloyd, A., Gray, T., & Truong, S. (2018). Seeing what children see: Enhancing understanding of outdoor learning experiences through body worn cameras. *Journal of Outdoor Recreation, Education and Leadership*, *10*(1), 52–66.

Magnusson, E., & Marecek, J. (2015). *Doing interview-based qualitative research: A learner's guide*. Cambridge: Cambridge University Press.

Maxwell, J. A. (2013). *Qualitative research design: An interactive approach* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Miles, M., Huberman, A., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Thousand Oaks, CA: Sage.

Pastore, R. (2015). Making multimedia learning more efficient: Current research and practice. *TechTrends, 59*(2), 66–74.

Paulus, T. M., Lester, J. N., & Dempster, P. G. (2014). *Digital tools for qualitative research*. Los Angeles, CA: Sage.

Peräkylä, A. (2005). Analyzing talk and text. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (3rd ed., pp. 869–886). London: Sage.

Poland, B. (2008). Transcription. In L. M. Given (Ed.), *The Sage encyclopedia of qualitative research methods* (pp. 884–886). Los Angeles, CA: Sage Publications.

Ranchal, R., Taber-Doughty, T., Guo, Y., et al. (2013). Using speech recognition for real-time captioning and lecture transcription in the classroom. *IEEE Transactions on Learning Technologies*, *6*(4), 299–311.

Rapley, T. (2012). The (extra) ordinary practices of qualitative interviewing. In J. F. Gubrium, J A. Holstein, A. B. Marvasti, and K. D. McKinney (Eds.), *The Sage Handbook of Interview Research* (2nd ed.), (541–554). Thousand Oaks, CA: Sage Publications.

Rubin, H. J., & Rubin, I. (2012). *Qualitative interviewing: The art of hearing data* (3rd ed.). Thousand Oaks, CA: Sage.

Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Los Angeles, CA: Sage.

Seidman, I. (2013). *Interviewing as qualitative research: A guide for researchers in education and the social sciences*, (4th ed.). New York, NY: Teacher College Press.

Stonehouse, P. (2011). *The rough ground of character: A philosophical investigation into character development, examining a wilderness expedition case study through a virtue ethical lens*. (Unpublished doctoral dissertation, University of Edinburgh, Edinburgh, Scotland).

Thomas, G. (2007). *A study of the theories and practices of facilitator educators*. Doctor of Education. EdD, La Trobe University, Bundoora, Australia.

Tilley, S. (2003). "Challenging" research practices: Turning a lens on the work of transcription. *Qualitative Inquiry*, *9*(5), 750–773.

Wainwright, M., & Russell, A. (2010). Using NVivo audio-coding: Practical, sensorial and epistemological considerations. *Social Research Update*, *60*, 1–4.

Wigglesworth, J. & Heintzman, P. (2017). Perceived life significance of a university winter outdoor education course: A qualitative study. *Research in Outdoor Education, 15*, 72–92.