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Using Grounded Theory to Analyze Qualitative Observational Data that is Obtained by Video Recording

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Abstract

This paper presents a method for the collection and analysis of qualitative data that is derived by observation and that may be used to generate a grounded theory. Video recordings were made of the verbal and non-verbal interactions of people with severe and complex disabilities and the staff who work with them. Three dyads composed of a student/teacher or carer and a person with a severe or profound intellectual disability were observed in a variety of different activities that took place in a school. Two of these recordings yielded 25 minutes of video, which was transcribed into narrative format. The nature of the qualitative micro data that was captured is described and the fit between such data and classic grounded theory is discussed. The strengths and weaknesses of the use of video as a tool to collect data that is amenable to analysis using grounded theory are considered. The paper concludes by suggesting that using classic grounded theory to analyze qualitative data that is collected using video offers a method that has the potential to uncover and explain patterns of non-verbal interactions that were not previously evident.

Introduction

Understanding how people communicate is difficult both for those who have the experience of an intellectual disability and for those who attempt to communicate with them (Caldwell 2007). This difficulty is magnified for people with profound intellectual and multiple disability (PIMD), who are confronted with many challenges in living their daily lives. Such challenges centre around how to comprehend the world that they live in. However, functionally, the primary practical concern that they have is how to communicate with a complex and at times forbidding world.

The research study from which this paper is derived aimed to develop a theory to explain how people with PIMD confront that primary difficulty and communicate with others. The aim of this paper is to describe the method that was used in the study. Video was the tool used to collect the data, and this approach to data collection, combined with a meticulous analysis of the videotapes, revealed the micro-behaviours that constitute the basic building blocks of dyadic communication. The progression in the data analysis process is described from descriptions of these micro-behaviours towards the emergence of the concepts of the theory. A discussion of the arguments for and against video-taping in the context of the development of grounded theory is presented and finally the strengths and weakness of the method are considered.

Background to the Study

People with profound intellectual and multiple disability (PIMD) have an intelligence quotient below 25 points (American Psychiatric Association 2000). They require virtually total care in terms of assistance in activities of daily living (Casella, 2005), they often have accompanying secondary disabilities such as epilepsy, physical disability or mental health difficulties (Nakken and Vlaskamp, 2007) and they do not use speech, but generally interact using non-verbal communications (Hogg et al., 2001). As well as being non-verbal, people with this severe degree of disability have only a restricted capacity to communicate in any mode (Grove et al., 1999). The effect of the multiple difficulties that people with profound intellectual and multiple disability are confronted with is that they have to deal with a world where they receive restricted sensory inputs which they must interpret through the prism of a limited cognitive ability. Such a situation leads to communication difficulties both for the person with PIMD and the people who do not have a disability but who may be related to the person with PIMD or may work to support them. These difficulties are functional in that they affect the way in which interaction occurs between people who do not have a disability (primarily staff and relatives) and those who do.

There is evidence that staff who work with people with PIMD frequently use complex language and plentiful verbal communications when interacting (Bradshaw, 2001). Such complex communications are not likely to be understood by the person with PIMD. However, staff must interpret what they understand of the communications of the person with intellectual disability so that they can act as advocates and facilitators for them (Grove et al., 1999). Equally, persons with profound intellectual and multiple disability interpret and react to staff behaviours and communications. The problem is that the accurate ascription of meaning to another's interaction is difficult for both parties. For example, people with such severe degrees of disability may do things slowly, pause unexpectedly or indeed produce very few behaviours (Ware, 2003), making understanding of the significance of their behaviours problematic.

The key issue then is that both the person with the intellectual disability and the person who does not have the disability are predisposed to mutually misinterpret each other's communications. Given that interaction is dyadic and may be viewed as a continuous process of social coordination (Fogel, 1993), the main concern of both the person with PIMD and the non disabled person is to understand the nature of this continuous communication process in order to communicate effectively with the other person.

The theory of attuning

The fieldwork for the study took place in a school for adolescents and young adults with PIMD in Ireland. There were three participants in the study who had a severe or profound intellectual disability, each of whom was observed in the classroom with a non disabled person, namely the staff member who was chiefly responsible for the person's care, support and education. Each pair (dyad of staff and person with PIMD) was observed for one hour, engaged in activities such as

playing games, singing stories, painting and participating in gross motor activities such as throwing a ball and walking.

The outcome of the study was that a theory of 'attuning' emerged to explain the interactional process (Griffiths, 2010). The theory of attuning offers a theoretical explanation of how people with severe or profound intellectual and multiple disability communicate with others. The theory suggests that the process of attuning regulates communication. Furthermore, it suggests that this is a reciprocal process whereby the concepts and processes apply equally to both persons who are communicating, irrespective of whether they have a disability. Thus attuning may be regarded as a dynamic process that describes how the communication partners move towards or away from each other cognitively and affectively. The theory of attuning has seven concepts: setting, being, stimulus, attention, action, engagement and the core category of attuning.

In brief, the theory suggests that all communication takes place in a setting (the place where the dyad is located), which influences the state of mind of the people in it (their being). The person's state of mind influences how the person behaves. He or she may offer a stimulus to the other person in the dyad, to which the other may attend and then action may follow. The application by one person of attention to the stimulus of the other is not inevitable, but if it does occur, it will affect how the person acts and if they become engaged (communicate) or not. The process that enables the person to act and to communicate is the process of attuning, which affects and reflects how the partners feel (their being), what they do and if and how they become mutually engaged. Attuning therefore describes the nature of the continuous process of communication, the understanding of which is the main concern of the participants in the study.

Rationale for Data Collection

It is said that data for a grounded theory research project should be obtained through using the best technique available to obtain the information that is desired (Glaser Strauss, 1967). Classic grounded theory (CGT) was chosen as the preferred method for the study because so little was known about the patterns of communication that were inherent in what the study participants did. The lack of knowledge of what concerned people with these difficulties, and how they interacted, meant that the researcher approached the research question with an open mind as to what might be found. This approach fitted with that of grounded theory. However, a sense that the solution to the problem lay in the detail was a starting point in seeking answers to the research question.

Accurate descriptions of what is going on "run a poor second" to "socially structured fictions" (Glaser 2001, p. 146). It seemed to this researcher that the virtue of grounded theory was its ability to accept all forms of data and also its neutrality in terms of its approach to the data. Furthermore, it appeared that these virtues would facilitate the emergence of an accurate understanding of the patterns of behaviour that were embedded in the data. In particular it was important to extend the uncovering of patterns within the detailed data of very

small behaviours of the participants. The 'all is data' perspective requires many incidents to compare and saturate categories (Glaser, 2001). The 25 minutes of videotaped observational data in this study detailed more than 1000 incidents comprising 36,000 data points. There is a danger in over reliance on descriptive data because the data may dominate the findings to the point that an accurate description of what happened emerges rather than a conceptual theory. I was aware of this danger and took active steps to avoid it by appropriate application of the constant comparative method.

The detail in the data

Observation through the use of videotaping produced a detailed recording of micro-incidents. Micro-incidents are the bedrock data that generated the categories which form the basis of the theory. Micro-incidents may be regarded as constituting an important data source for the generation of theory because ultimately, an understanding of what is going on in the data is derived from constant comparison of micro-incidents, rather than macro-situations (Glaser, 1998). This study collected interactional data. Interactional data can be derived from interviews or alternatively from observation. This constitutes the verbal-actual axis (Glaser, 2001) of both talk and behaviour. Thus, verbal interactions, non-verbal interactions, and all observable behaviours that were displayed by the participants in the dyads in the view of the camera constituted the data. Video recordings were made of three of these dyads, each of which consisted of one student with PIMD and one carer or teacher (who was the student's keyworker). Each one hour recording sampled the student and keyworker in a variety of educational activities. In order to manage the mass of recorded data, just two of the three recordings were examined and between them selected episodes of interaction were examined, which yielded 25 minutes of data which were transcribed and analyzed.

All communications and behaviours that were observed during the 25 minutes of video were logged into a narrative that encompassed the totality of observed behaviours of both participants in the dyad. This was achieved by running the video-tape at normal speed, running it slowly and running it frame by frame, where each frame encompassed 1/24th of a second of the action. It has been noted that capturing of recorded video in a very thorough narrative transcription sensitizes the researcher to the observation of micro-events (Nilsson, 2012), a process which was very evident as the data transcription progressed. The narrative illuminated the verbal and non-verbal interactions of both participants in the dyad in detail and in sequence. Nilsson emphasises the utility of thorough transcriptions of micro-events, which enables the researcher to become aware of the "small details, changes and deviations in the action on the video recording" (Nilsson, 2012, p. 110). This awareness of small events was facilitated by the development of a list of possible target behaviours that would constitute baseline data.

Grounded theory classifies data into four types, in descending order of accuracy these are: *baseline data* which is the participant's best description of what he or she has to say, *properline data*, which is named when the participant tells what he/she thinks he or she is supposed to say. *Interpreted data* and

vaguing out are the least accurate data form. Glaser comments that baseline data is the “best description the participant can offer” (Glaser, 1998, p. 9). A check sheet of indicative behaviours was developed in order to orient the researcher to the types of behaviours that might be found. The check sheet was based on the relevant literature but also on discussions with Jenny Wilder, who had conducted similar observations of young children with intellectual disability (Wilder, 2005). This was by no means a comprehensive list of behaviours but it illustrates typical macro and micro-behaviours that occur in this type of interaction.

Vocalisation	Eye expression	Facial expression	Body activity	Gestures
Loud breathing	Gaze towards a person	Smile	Stretches	Lifts arms
Cry	Gaze towards activity	Chew	Collapses /Slumps	Stretches out arms
Laughter	Gaze towards object	Mouth open	Turns head away	Nods
Clears throat	Turns gaze away	Forms mouth	Collects body before activity	Pulls away hands
Cough	Focuses using joint attention	Frown	Body upright and alert	Gives hands
Spits	Blank stare	Purses lips	Stillness	Shakes head
Smacks mouth	Winks			Makes minor hand movement
Scream	Eyes closed			Makes arm movement
Normal breathing				Scratches
Babbles				Rubs
Moans				Points to object/ person
Silent				Gestures to ask for help
Speech/ vocalisation				

Table 1. Indicative behaviours.

Because grounded theory research is “collection method neutral” (Glaser, 2007, p. 20), as a research method, it can conceptualise any form of data. However,

interactional observations have been specifically identified as a form of data that may generate theory (Glaser, 2007). In short, the verbal-behavioural data juncture may reveal accurate detailed description of the behaviour that is observed or it may not. Grounded theory is not concerned with describing the data but with identifying the patterns that are inherent in the data. These may initially be inaccurate, however grounded theory has the capacity to correct inaccuracies, as the inherent patterns will inevitably emerge as data saturation is approached. This tendency for the data to self-correct was evident in the identification and emergence of the categories of data in the study. At the same time, the reliance on detailed baseline data meant that the patterns of behaviour that were being identified were patterns of very small behaviours, behaviours that might ordinarily remain unobserved.

There are doubts as to whether the collection of audio recorded data facilitates the development of a grounded theory. Indeed, it is suggested that it may actively hinder it (Glaser, 1998), largely because it promotes descriptive completeness rather than conceptualization of the data and hence it may hinder the development of theory. In considering whether such doubts apply to the use of video recorded data, Nilsson (2012) reports that Glaser acknowledges that the use of video is the only method that is sufficiently sensitive to be capable of capturing micro-communications and that for research participants who are non-verbal and therefore communicate by means of macro and micro non-verbal communications, there is no other method of collecting "original information explaining what was happening in their field of interest" (Nilsson, 2012, p. 107), that is, baseline data.

Data analysis

In undertaking this study, I took as the starting point Watzlawick et al.'s (1967) statement that observation of non-verbal behaviours has been shown to offer a powerful insight into the meaning that people place on an interaction. It seemed to me that such an assumption underpinned the identification of the main concern of the participants and how they resolved it. In order to achieve these goals, I sought to make a detailed description of observed communications and behaviours of both the person with a profound intellectual and multiple disability and his or her keyworker. The narrative data that was collected detailed the sequence of interactions. As a result, in some interaction sequences several behaviours could be identified as occurring in a very short period of time, with the result that a very fine detail of what happened in the communication was evident.

From a grounded theory viewpoint, a legitimate criticism of such a process is that the over concern with detailed description may impede the raising of the analysis to the conceptual level. In order to overcome this danger during the data analysis I constantly looked for patterns in the data and was aware of the injunction that grounded theory is based on a "latent structure analysis approach using a concept indicator model" that yields "emergent theoretical frameworks that the researcher must stay open to" (Glaser, 2005, p. 5).

Once coding of the data commenced the codes were tracked by physically moving and amending hard copies of each code as the code evolved and as its location within the emerging theory became clear. The constant comparison process not only generated codes that changed as the data analysis continued, but it also generated memos. The early memos detailed the properties of the codes, but as time went by, the memos indicated how codes should be sorted and tentatively named the categories (concepts) to which they belonged. This was the process that is described thus "in sorting, the analyst is constantly moving back and forth between memos and a potential outline working with it so everything fits" (Glaser, 1978, p. 118). In all, over 200 memos were written.

As the analysis progressed and as the core category and the eventual vertical structures of the theory (the seven categories) emerged, the memos became more sophisticated. Through the constant comparison of the emergent categories, ideas were developed that explored emergent relationships between those categories and also between codes both within and between categories. The result was that the memos wove a horizontal mesh that named the relationships that were inherent in the theory, some of which are detailed in section two. The increasing sophistication of the memos was in many ways the key to the process and it enabled an understanding of how a minutely detailed micro-communication such as a glance from one person to another might form part of a macro-theory which explains how the attention process (of which eye gaze is one small part) operates.

Evaluation of the Use of Video

The advantages of using video to record, and subsequently to document the action and interaction that was the subject of the study, were immense. Detailed descriptions of every action, pose, posture, movement, gesture and vocalisation of the participants were made. The narrative was embedded in the transcription structure such that precise sequences of communication and interaction were clearly identifiable. This is, in fact, the nub of the matter; video allowed for the collection of extremely detailed data that revealed what was not evident to the observer of action in real time. The fruit of this process was the fine-grained detail of incidents and sequences in behaviour that constituted the transcription and formed the basis for the data analysis. Arising from that transcription it became possible to identify the patterns in the micro-behaviours and micro-communications that constituted the interaction process. In view of the fact that these micro-communications were predominantly gestures, marginal vocalisations, alterations of eye gaze and inflections of body parts, behaviours which are easily missed or at least not consciously registered in real interaction, the use of video constituted a way of seeing what had not been seen before.

It has been noted that the examination through the use of video of fine detailed 'nuanced expressions' such as these, opens the way to the analysis of interactions and micro-behaviours that occur at other levels than that of the obvious activity that is evident in real time interaction (Nilsson, 2012). Such minute changes in behaviours are virtually impossible to identify without using

video (Nilsson, 2012). However, video unveils this world of nuanced expressions and makes these communicative behaviours amenable to interpretation.

There were two limitations in this study to the use of video. The first was that I was present in the classrooms where the interaction took place and my presence was compounded by the video camera and the stand upon which it sat. This can induce the Hawthorne effect (Heacock et al., 1996), which suggests that the presence of the researcher affects the people being observed (Polit and Hungler, 1999) and therefore the observed behaviours are changed because an observer is seen to be watching. The consequence of my presence in the classroom setting was that I took the role of 'observer as participant' (Speziale and Carpenter, 2007), which led to minimal participation in the action. On a few occasions I interacted with the participants in order to maintain the relationship which had been established prior to and during the data-gathering period. This begged the question: Did my presence affect the action that was taking place? The answer to that question can only be a subjective one, which was: not very much. Diary records show that I had spent some considerable time becoming familiarised with the participants before the observations commenced. The video records show that for most of the time, the participants were involved in interacting with each other and appeared to give little thought to the camera and observer. That view is an interpretation of the behavioural evidence. However, there was no evidence observable to me to gainsay that conclusion.

The second limitation of using videotaped data in this study was the length of time that the analysis took. The transcription of the videotapes was the most painstaking and slow phase of the data analysis. This had to be carried out in order to render as precise a written description of the data as possible. As such, each episode in the tape was viewed in real time, in slow motion and generally frame-by-frame, in order to ascertain the exact behaviours that were occurring and the precise sequences in which they occurred. Typically it took five and half hours to transcribe one minute of Tony and Mary's (one of the dyads) video and this covered 11 pages of transcript.

Indeed, it took two months of intensive work to transcribe 13 minutes of tape. Such lengthy data analysis is not untypical. Schonfeld made a videotape of a case study of one student engaged in a graphic educational computer game that attempted to "understand virtually all the actions taken in a problem session and the mental states that lay behind them" (Schonfeld, 1992, p. 182). Schonfeld asked the research group to analyze the behaviours that they saw. This took the group (the number of whom is not specified in the report) 18 months to analyze 7 hours of video. In the context of 'thick description' of an event, he notes that the descriptions were "thicker than most" (Schonfeld, 1992, p. 209).

Discussion: Unearthing the complex

This study attempted to uncover some of the more fundamental elements and the inherent patterns in the complex nature of human interaction. In order to achieve this aim video recording was used. As explained above, the videotape was analyzed by running it at normal speed, running it slowly and running it frame by

frame, where each frame encompassed the action of 1/24th of a second. Such detailed analysis allowed the synchrony in the interaction process to become clear, as well as the relationship between motor movements of both persons to become evident as the movements of each developed and decayed. Furthermore, the precursors of each person's interactions were made explicit. It was interesting to note that a repeated behaviour of one individual in many cases elicited different reactions from others depending on whom that individual was interacting with. Equally in many cases a pattern was established, whereby the same behaviour of one person consistently elicited the same reaction from the other person. When the reaction changed, the influence of different variables in the setting could be identified as the cause.

Density, precision and permanence

Video permits the fine-grained, detailed nature of the data that is; it's density to be made explicit (Latvala et al., 2000). Dense data typically contains subtle communicative behaviour. A good example of dense data is a sequential analysis of shifting eye gaze patterns between two people. Eye gaze changes quickly, at times up to three to four times per second. However, as the interaction was analyzed 24 times per second, the precise record of how a person's gaze shifted from one focus to another was identifiable, as was the movement of the person's attention from one stimulus to another and the resulting changes in eye gaze and other interactions of the second person in the dyad. Thus, detailed analysis demonstrated the interdependence of each person in the communication process.

The quality most clearly demonstrated by the analytic process was its precision. Heritage concurs with this view and notes that attaining a high level of precision is enabled by videotaped data (Heritage, 1984). This view is reinforced by Heacock et al who comment on the capacity of video to allow fine-grained recording, they state that "it is not unusual for an observer replaying a videotape to detect nuances in non verbal behaviour that an observer in the field setting missed" (Heacock et al., 1996, p. 336). In short, the density of the data was uncovered through the precise nature of the analysis. However, that precision was only made possible because of another aspect of video, namely it's permanence which meant that it could be viewed as many times as required and in many different ways. To sum up this section, video enables data to be collected that is permanently on record, that can be very complex or dense and that can be analyzed precisely in fine detail.

Conclusion

This paper has considered how grounded theory may be utilized as a mechanism for the analysis of observational qualitative data that is derived from videotaped interactions. In this case, the interactions were of people with profound intellectual disability and their carers and teachers. The nature of people with such severe disabilities is that they cannot interact in an ordinarily recognised manner; they have little or no speech and their non-verbal behaviours tend to be idiosyncratic. Video offered a possibility of examining these behaviours and those of the non-disabled partner in detail, with the consequence that the grounded

theoretical analysis made it possible to identify the main concern of the participants. It also enabled the patterns in the data to be identified. Thus, it facilitated the emergence of a theory explaining how the participants met the main concern. Video recording was integral to the research method and as such it is recommended as a mechanism for the investigation of interaction particularly in situations where the nature of the interaction is obscure. Lastly, this study found, as others have done, that the linkage of video and classic grounded theory provides a method which has the potential to uncover patterns of human behaviours which previously were not evident and thus to explain what is happening in complex social situations (Nilsson, 2012).

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