'Incorporating Complexity Theory and Feminism into Video Ethnography'
ASCPRI STREAM: The Use of Video in Social Science Research

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Abstract

This research uses video firstly as a tool for data collection, and secondly as a method for reflexive sessions that engage both the researcher and clinicians in reflexive viewing of organisational aspects of clinical work. By focusing on empirical data from video-ethnographic research in an intensive care unit (ICU) in New South Wales (NSW)[1] this paper broadly demonstrates the compatible intertwining of complexity theory, feminist research principles and video-reflexivity.

Complexity theory views social systems as living, learning and self-organising which means that social systems such as the ICU incorporate and adapt to new information. Complexity theory frames the reflexive use of video in the clinical setting as a provider of new information to clinicians, and therefore as a potential catalyst for organisational change. An example of productive organisational change facilitated by a video-reflexive session regarding medical communication practices in ICU is outlined. This paper defines clinician and researcher reflexivity as a process of employing a critical edge to dynamically positioning the relationships between one's self, other selves and the contextual influences that shape clinical and research work. Thus reflexivity involves active attention to the management and organisation of one's own practice and the practices of others within the wider context of the clinical and research environments. Herein lies the paper's second focus: the researcher's own reflexive engagement with video ethnography. Using the feminist research principle of examining power relations and transparency in the research process this paper outlines how video-as-method was particularly facilitative of the researcher's own reflexivity which manifest in ethical practice.

Introduction: Intertwining Video with Feminism and Complexity

This paper offers a theoretical account, supported by empirical data, of a methodological intertwining of complexity theory and feminist research principles in the use of video-ethnography and video-reflexivity in hospital research. Contributing to the methodological praxis outlined in this paper are the critical feminist politics that feed into fundamental research principles across the many feminisms. These feminist research principles aim to challenge dominant belief structures that may support social asymmetry, limit human freedom and disempower people in vulnerable positions (Cook and Fonow 1990; Esterberg 2002). These principles can be fed through many social theories in order to frame and realise these fundamental political goals. This research utilises complexity theory to frame the relationship between clinicians and their enacted clinical-organisational processes, technologies and wider hospital influences in the intensive care unit (ICU). Common to both complexity and feminist approaches to research is the aim to *understand*, rather than *predict* and *control* the relationships between system components, which underlie the behaviours and processes of the social system of interest. A second commonality is the fundamental theoretical dissolution of the researcher-participant divide, and the breaking down of power relations through an 'upfront' mutual involvement of the researcher and participants as part of research practice and research design (Eoyang 2004). These discourses therefore neatly interlock in framing a research approach. Video ethnography and video-reflexivity were the methods chosen to gather data and facilitate active co-involvement of researcher and participants in meaning-making in this field site. This paper demonstrates an engagement of feminist research principles and complexity theory in the methodological praxis of video-ethnography and video-reflexivity. In doing so, it denaturalises the methodological praxis of video-ethnography and video-reflexivity through an introduction of researcher ethics.

The development of digital technology has enabled a new methodology to relatively easily enter the hospital environment: minimally intrusive handheld cameras, relatively portable storage devices for data analysis and presentation, and user-friendly software allow researchers to store, analyse and construct a sequence of moving images (Pink 2001: 77). Video is a tool that can be successfully used in examining communication and interactions, as video captures *actual* behaviour which can be retrieved time and time again for analysis. This feature is named 'permanence' (Bottorf 1994: 246). The density and permanence of video (Bottorf 1994), 'allows for detailed, minute observations, practices and interactions'(Iedema, Forsyth, Long, Carroll, Delaney, Jacob, Barton, Braithwaite, Westbrook, Lee and Kerridge 2005). I used video in ICU as a tool to collect and record data, and to construct sequences of data to present information back to ICU clinicians and other researchers. However video-as-method was not used in isolation. Extended observations and field-interviews occurred prior to, and along side the use of video. This approach enabled sensitivity of when to use the camera in the field site. Video that is used alongside ethnographic methods, we term 'video-ethnography' at the

Centre for Clinical Governance Research in Health[2] thus video used ethnographically and reflexively is not just a means of collecting data but as a means of creating ethnographic knowledge (Pink 2001: 77). I acknowledge that as a researcher I work alongside participants to actively construct a representation of what we see, hear, feel and experience in the ICU.

This paper uses the term 'reflexivity' with regards to 'video-reflexivity' where clinicians view and interpret their practices on video, and also with regards 'research-reflexivity' where the researcher positions herself in the research process. A definition of reflexivity is therefore required and a starting point is to distinguish between reflective and reflexive practice. In this paper 'reflection' is a process that can be considered deliberative, thoughtful and meditative where thought about practice tends toward what one did, or how one felt. 'Reflexivity' refers to a performed action that is directed back on to the actor. Reflexive practice brings circularity, and potentially a critical edge, that positions the subject in relation to practice, other subjects and broader influences of our actions that shape our own and others' work. Reflexivity in this way involves active attention to the management and organisation of self, practices and the contextual environment. In other words, how am I doing what I do, what are the effects, and how do these integrate with others' practices and the larger environment, rather than a simple reflective 'what do I do'? In using video reflexively with clinicians, 'video helps reveal existing practices...as well as meanings and feelings underlying these practices' (Iedema, Forsyth et al. 2005). Video reflexivity in this project involved clinicians reviewing edited clips of their 'real time' work on video in a settled environment away from the attention-dividing and very busy hospital environment. By engaging clinicians, video reflexivity is said to simulate and facilitate the negotiations and management of the differing viewpoints and interests, and the positioning of the self in relation to practice, all of which are interwoven in daily clinical and organisational practice (Iedema, Long, Forsyth and Lee 2006).

This paper provides two empirical case-studies that exemplify the intertwining of feminist research principles and complexity theory, that underlie the methodological praxis undertaken in this research of clinicians in an ICU. The first example outlines the structural changes that occurred to the ward round in ICU as facilitated by a video-reflexive session with medical clinicians. This case study utilises the complexity principles of system feedback and learning. Changes in ward round practices demonstrate complexity theory informing video-ethnography and video-reflexivity as praxis through the notion of feedback and system learning. Providing a legitimised feedback-through-research space within the busy clinical environment gives voice to issues that otherwise would not fall within the bounds of clinical work. More importantly, this paper shows that within this legitimised research space, a 'deliberative-democratic space' (Dzur 2002) can be created through the application of fundamental feminist research principles where power relations can be exposed or altered for both clinicians and researchers alike, at least during the duration of the reflexive session, if not beyond. The second empirical case study tells of video-ethnography and video-reflexivity facilitating feminist research principles: researcher-reflexivity and attention to

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[2] The Centre for Clinical Governance Research in Health is a research Centre in the Faculty of Medicine, University of New South Wales, Australia.

power relations with participants. An uncovering of the power of video as a visual medium during the editing and clinician-reflexive sessions facilitated the researcher's own reflexivity.

By viewing video-ethnography and video reflexivity through the structure of complexity theory and feminist research principles, this paper offers a rich methodological praxis in using video in health social science research. More importantly, this paper provides attentiveness to ethical practice with a powerful research tool, and an account of ethical relationships with research participants as mediated by video.

Feedback: Complexity Theory and Video Reflexivity

There are over 45 definitions of complexity (Kernick 2006). Complexity is an umbrella term for developments in non-linear science showing systems to be open to, and interactive with their surrounding environment, contributing to the nonlinearity and unpredictability of complex system behaviour. In the 1920s quantum mechanics challenged Newtonian linearity (Price 1997: 4), the notion of prediction of system behaviour, and the separation of the observer and the observed at the quantum level. This is just one contributory to the 'new' or 'complexity sciences'. Complexity literature is also used outside the natural sciences to quantitatively model social systems. It has also been used qualitatively in social science due to its rich metaphors (Begun, Zimmerman and Dooley 2003: 260), including in the health (e.g. Zimmerman, Lindberg and Plsek 1998) and public services (e.g.Haynes 2003). The principles underlying the rich metaphors that are commonly used in the applied complexity literature include interconnectedness, unpredictability, emergence, context dependence, order in disorder, and open systems. There are copious crossovers between the concepts in the scientific, sociological and applied literature, for example, complexity was born of chaos theory (Byrne 1998: 5), and both chaos and complexity are regularly used interchangeably (Albrecht, Freeman and Higginbotham 1998: 17). I will briefly outline the 'complexity paradigm' as it is used in this paper.

The central idea of complex systems is that there are many interactions and therefore 'entanglement' between component parts (Haynes 2003: 24-5). The interactions between these parts create emergent properties or unexpected outcomes which are context specific, non time-reversible (Byrne 1998: 15; Zimmerman, Lindberg et al. 1998: 263), nor predictable into the distant future (Haynes 2003: 24). A feature, or subset of complex systems is the adaptive nature of the system to changing environments (Zimmerman, Lindberg et al. 1998: 263). Complex Adaptive Systems (CAS) assimilate, learn and adapt as a result of information fed through the system, generated from the systems own outputs or behaviour. Feedback mechanisms in a CAS involve the external environment and outputs from the system itself. This is a central linking concept that intertwines complexity and video-reflexivity.

This research characterises ICU as a complex system as it contains highly connected human and non-human (technological) elements that interact, giving rise to emergent phenomenon, non-linearity and unpredictability. This is not surprising as ICU is a social

network, and most societies could be considered complex systems (Eve, Horsfall and Lee 1997). Unlike a Parsonian view of social systems, complex systems such as the ICU demonstrate dynamism and change and self-organising principles rather than tending toward an equilibrium through negative feedback mechanisms in the form of top-down structural management (Urry 2003). Rather, complex systems are likely to generate positive feedback over time, where 'change is reinforced rather than dampened down' (Urry 2003: 13) which takes the system away from equilibrium, explaining the dynamism and change, and generation of new orders in social systems (Urry 2003: 26-7).

There are significant commonalities between the notion of video reflexivity generating new ways of seeing practice and therefore facilitating organisational learning, and the notion of positive feedback in complex systems. Video-ethnography constructs rich information through the form of moving audio-visual images of clinician practice. Through showing this data in video-reflexive sessions further data is generated by the researcher and clinicians interpreting the visual data (Iedema, Forsyth et al. 2005; Iedema, Long et al. 2006) within broader ethnographic and 'lived' knowledge of clinical-organisational behaviours. A feedback loop within the ICU system is generated by researchers and clinicians working together with video-reflexivity to provide a new 'view' of clinical-organisational work. As the first case study will exemplify, this feedback loop provided an opportunity for adaptation and improvement and is a clear example of positive feedback in a complex social system. The video-reflexive process also highlights the participant-researcher relationship as intertwined, a notion that complexity theory supports. More importantly though is how the relationship between participants and researcher in the research process, and it is here where feminist research principles intersect with complexity theory by providing an ethics of praxis.

Feminist Research Principles meet Complexity Theory

There are multiple feminisms and feminist methodologies, that generate foundational principles (Crotty 1998; Olesen 2000; Esterberg 2002). Cook and Fonow (1990: 71) importantly note that there should not be a strict and closed set of principles that define a feminist methodology in order to prevent the wide variety of other approaches which may have feminist relevance, and thus, in sociology, they argue 'feminist methodology is in a process of becoming'(Cook and Fonow 1990: 71). There has been little feminist critique of complexity science and its methodologies, unlike the feminist critiques of Newtonian science of which the most notable is Fox Keller (eg. Fox Keller 1990). This paper has considered the commonalities between complexity and feminist research approaches. This paper outlines a collection of feminist methodological principles that cut across the diverse feminist methodology literature, but goes a step further by classifying them as sharing a methodological praxis with complexity theory (Fig 1). Tying feminism and complexity theory together methodologically relies on shared fundamental principles. Qualitative and integrative transdisciplinary research, like feminist critical social research aims to 'understand and interpret' rather than 'predict and control'(Esterberg 2002: 17). This sentiment is also echoed by complexity theories (Capra 1982) which challenge the Newtonian assumptions of system predictability. Further methodological tenets that both

feminism and complexity theory share include prioritizing the relationship between agents across time in order to understand a living, dynamic and social system and dissolving the notion of an independent and objective observer.

ETHICS: Feminist research methodologies aim to:

- Challenge the dominant existing belief structures, including patriarchy that 'restrict or limit human freedom' (Esterberg 2002: 17)
- Continuously attend to 'the significance of gender and gender asymmetry as a basic feature of all social life (Cook and Fonow 1990: 72).
- Use methodology that is consciousness raising and empowering for women (Cook and Fonow 1990: 72-3).
- Attend to 'ethical implications of feminist research and recognition of the exploitation of women as objects of knowledge'(Cook and Fonow 1990: 72-3).

Feminist **PRAXIS** in agreement with complexity theory

- Dissolution of the researcher-participant divide, and reflexive account of the researchers' role in the research process (Cook and Fonow 1990: 72; Westcott 1990: 60; Naples 1996; Olesen 2000).
- 'Understand and interpret' rather than 'predict and control'(Esterberg 2002: 17)
- Practice 'holism': the investigation of issues that heavily structure womens' lived experiences traditionally ignored in workplace research (Esterberg 2002: 18).

Figure 1: Feminist Research Principles which include shared praxis with complexity theory

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Catalysed by the researcher's video editing in the construction of the 'organisational side of rostering' reflexive session for ICU nursing staff, a complexity-feminist research principle was practiced in this research: reflexive engagement of the researcher with the research. This is outlined in case-study two. Tying together both case studies is the overarching notion of creating space for challenging dominant existing belief structures that contribute to asymmetries of power that particularly affect vulnerable positions in the social system under research. In case study one, those in the vulnerable position are patients. This reflexive session 'visibilized' (Iedema, Long et al. 2006) the inefficient ward rounds that resulted in less time being spent 'on the floor' by senior medical staff, or 'intensivists'. This time 'on the floor' is important as the presence of the intensivist in the unit has a measurable positive effect on patient outcome due to their 'ability to manage organisational and clinical uncertainty and to encourage and train other staff in such management'(Carmel 2003: 64). Other positions of vulnerability include clinicians in the hierarchy of ICU. For example, the reflexive session in case study one facilitated the realisation by senior doctors the tension that junior doctors face in presenting when fatigued and under pressure to perform in front of senior doctors. The reflexive session also provided a space that resulted in a change that the nursing staff had been requesting of doctors for years.

In case study two, the vulnerable position is filled by those with care responsibilities outside the workplace. Researching the organisations' need for labour manifests the unequal social relations that exist for many nurses who through providing bodywork

labour are synchronously juggling more than one identity and whose embodiment is often required in more than one space at the same time. This is particularly the case for women, who undertake the majority of unpaid labour in households that contain partners and / or children (Bianchi 14 June 2006). Therefore approaching rostering as a 'one size fits all' approach is inappropriate for people with different embodied identities and responsibilities. Exploring the 'underlying mechanisms of social relations'(Esterberg 2002: 17), such as notions of sameness and difference between and within the genders, and how this intersects with the unencumbered worker typical of organisations highlights an issue that heavily structure womens' lived experiences that has traditionally been ignored in workplace research (Esterberg 2002: 18). I opened for critical examination the processes of managing the nursing rosters in the ICU which requires fielding dense 1:1 nurse – patient ratios 'around the clock'.

Linking both case studies is a core message of this paper: the visual medium, that is video, is a powerful tool. Due to the power embedded in the qualities of video data; dense, rich, retrievable, recognisable and 'real', it can heighten the power of the researcher's constructed position when edited video is presented back to participants for feedback. This is not to say that participants are not capable of deciphering and actively critiquing visual data. However attending to the power of the researcher in constructing visual messages, I argue is necessary in the use of video as method.

Case Studies[3]

Case-Study 1: Video-reflexivity and Complexity Theory

The ICU ward round and planning meeting are formal means of communication, each considered by the medical staff as essential for communication, updating, problem solving and educative opportunities. The ward round is an opportunity to pass on to the audience of medical, nursing and allied health clinicians, a mass of clinically significant physiological detail and major patient status changes at a medical shift change over. Demonstrating the complex system mechanics of entangled process over simplistic structure, the ICU ward round is a collection of homogenized and oscillating statements and discussions of patient details. These include the trajectory of care, scheduled or required tests and procedures, potential admissions to the unit, recounts of the most recent medical emergency team (MET) calls, and the quizzing and education of junior medical staff. Given the multitudinous functions of the two formal communication periods, it is not surprising that a lack of structure in communicating 'big picture' patient trajectories and the significant finer physiological detail emerged from the analysis of the fieldwork and interview data as a prevailing issue. This coding was verified by medical staff who clearly expressed the need to have a *concise, structured* handover to obtain adequate knowledge in a *timely* fashion while balancing big and small picture information sharing, work-planning and education of junior staff.

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[3] All names used are pseudonyms.

Using video to facilitate reflexive practice in a location away from the 'hurly burly' (Iedema, Long et al. 2006) of the ICU was a rare, yet important opportunity in the schedule of busy ICU intensivists to potentially reconcile competing factors. The reflexive session involved ten intensivists and the session of discussion lasted for well over the allocated hour.

The multitudinous and homogenized nature of communication reported in the literature (e.g. Hunter 1991; Atkinson 1995; Manias and Street 2001; Carmel 2003) and found by the researcher in this ICU was also clearly seen by the medical staff upon viewing the DVD. The power of the visual and viewing 'real' work practices on DVD in combination with the opportunity to talk about communication issues in a focused environment successfully catalyzed new ways of seeing ward-based communication. This is evident in the following comments made during the reflexive session by intensivists:

> '*I realized that it was intimidating and daunting for junior doctors*'
>
>> (Paulo, 26/10/2005)

> '*I hadn't realized it was also about putting on an act*'
>
>> (Paulo, 26/10/2005)

> '*I also realized there is a complex and fragmented flow of communication. There were several contributors, talking at different levels and about different things*'
>
>> (Paulo, 26/10/2005)

> '*I learnt something and it only took 15 seconds*'
>
>> (Intensivist 2, 26/10/2005)

> '*One thing that struck me from watching the video is the endless interruption*'
>
>> (Intensivist 1, 26/10/2005)

The combination of video-ethnography, video-reflexivity and clinician-researcher collaboration catalysed ward round redesign and its relatively smooth acceptance into the unit. Changes to the ward round and planning meeting occurred within the 2 weeks that followed the clinician video reflexive session. The ward round was split in two and occurred concurrently at either end of the ICU. This more than halved the time the medical staff were involved in the ward round and increased the amount of time for direct patient care such as assessment and treatment. Secondly, a daily worksheet was designed to "assist with an organised review of each patient in ICU and that clear instructions and goals are communicated between all staff" (Havill 2005).

Discussion

Complex systems are open systems that have permeable boundaries which exchange energy and information with the wider environment. CAS have feedback loops where information generated from the system is fed back and incorporated into system process, often resulting in structural or process adaptation to this new information. In this sense, involvement from an external researcher, the editing, the analysis and then presentation of video data obtained from the ICU and then reintroduced thematically for viewing by ICU clinicians can be a likened to the CAS learning from, and adapting to information input from its wider environment.

The application of video reflexivity to medical communication efficiencies in this ICU is a perfect example of a complexity methodology outlined by Eoyang (2004) who explains the use of 'practice' techniques to uncover 'evident deep structures'. Evident deep structures are underlying influences that feed into a problem, which although articulated by participants cannot be solved (Eoyang 2004: 56). The application of tools and disciplinary knowledge by researchers at a very practical level (such as video reflexivity) involves no complex language or complex analysis, and participants can be satisfied by the accessibility of the problem–solving approach (Eoyang 2004: 57). Video reflexivity as one example of one complexity-driven methodological approach also contains one of Cook and Fonow's (1990: 80) feminist research principles: 'empowerment and transformation', where tools are transferred to the participants themselves to create their own plan of action.

Using the feminist research principles of examining power relations and transparency in the research process potentially dismantles the researcher-participant divide. The next section outlines a case-study of how video-as-method was particularly facilitative of the researcher's own reflexivity in attending to the two aforementioned principles.

Case Study 2: Researcher Reflexivity

'Rostering' in ICU balances organisational and staff demands, patient safety, staffing regulations and the myriad of personal dilemmas that are presented daily to the middle management. I had obtained excellent data on the rostering frustrations of nurses, therefore my agenda was to present middle managements' rostering work - meeting organisational needs and managing the requests and idiosyncrasies of over 150 nurses shift preferences - to the bedside ICU nurses. I compiled a DVD[4] of middle managements' rostering labour. The video clips I selected showed the 'organisational side' of rostering as an attempt to bypass the potential of the group centering on further rostering complaints. In doing this the ethical issues of high manipulability of digital data and my significant power and agenda setting as a researcher became evident.

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[4] I constructed a ten minute DVD presenting middle management nurses creating a roster, considering staff and organisational needs, scrolling through pages of nurses requests and narrating the mental processes that are considered throughout this task.

All data and methodologies such as the choice of language, the use of quotations and the structured interview schedule contain constructed agendas. However it is precisely the power of the visual medium due to its richness and perceived 'realness' that, I argue, requires a special attendance by the researcher to power and transparency. Using feminist research principles, and facilitated by my role in the construction of the DVD for clinician reflexivity, I examined my power, relationships with participants and transparency in the research process.

The power I had in the construction of the argument presented through the selected visual data was confirmed when the nursing participants' supported the positive angle I had convincingly constructed of the nursing middle managements' work:

> *'oh good old Devi...she really tries'*
> *'She's so sweet' '*
> *'I wouldn't want that job for quids'*
>   *20 / 10 / 2005, Nurses Reflexive Focus Group*

Stated positions like those above were not elicited when field-interviewing nurses about rostering. In other words, the video had succeeded. The job of middle management was perceived as difficult and as requiring a balancing of many organisational and human resources related tensions.

Discussion

Completing reflexive sessions while foregrounding feminist research principles potentially exposes organisational practices and topics for discussion that may remain hidden or appear 'facially neutral' (Thornton 1990: 7) such as rostering in the busyness of clinical work. Similarly, by reflecting on video as a tool for ethical data presentation, the power of this visual tool foregrounded power relations that equally could have appeared as 'facially neutral' in the research process.

Researchers would be wise to acknowledge the high manipulability of digital data, such as the seamless joining of different times and spaces, voice dubbing and pixilation while constructing their 'position' on a DVD in order to address power relations and transparency when 'feeding back' to participants. Secondly, acknowledging the representation of the field site as only a portion of the hours of film, and therefore only a portion of opinion, is necessary. Similarly, it is important to acknowledge during analysis and to participants during reflexivity that my controlling of the camera, and therefore framing of the data, resulted in one of many alternatives of representation. Pink (2001) states that 'video and the researcher become part of a focus group discussion or interview, as the video footage obtained provides an indication of how the researcher was involved in research interactions' (Pink 2001: 87). Foregrounding the high manipulability of digital data, representation of the field site is necessary because despite collapsing multiple views, times and spaces into a short segment of video data for reflexivity, the short video segment remains both rich and powerfully 'real'. Therefore

acknowledging and perhaps problematising the high manipulability and representation issues of video remains important.

Acknowledging the connection between researcher and research participants is well embedded in reflexive video sessions for both are integral to the concept. This case study broadly demonstrates compatibility between video reflexivity and feminist research principles, and which I argue is necessary due to the power of the visual. Pink supports this approach in visual ethnography by stating that as researchers we need to consider our relationship not only with the participants that appear in our film, but also with our relationship and agendas with the camera and its recordings (Pink 2001: 78).

Conclusion:

Enriching video in health social science research through complexity theory and feminist research principles

This paper has outlined the intertwining of complexity theory and feminist research principles which underlie video-ethnography and video-reflexivity as praxis. By filtering video ethnography and video reflexivity through complexity theory and feminist research principles it has provided additional richness in a methodological discussion of the role of video in hospital-based research. This paper has demonstrated the power of video-ethnography and video-reflexivity in the hospital environment as a research tool, as a means for clinicians to view and potentially improve their practices and as an aid to researcher reflexivity.

The relationship of researcher, participants and video is clearly evident in research that informs not only the researcher but reciprocates through visual feedback – that is video-reflexivity. Video reflexive space legitimises a research space or even creates Dzur's 'deliberative space' where an altering of power relations allows a space for clinicians and researchers to interpret the visual data. The power of audio-visual data gives it leverage among other methods of feeding back research to participants, and as demonstrated by this paper, is convincing in the decision making process. The researcher is intimately intertwined in the collection, editing choices, facilitation of reflexive sessions and analysis. As researchers we need to consider our relationship carefully, not only with the participants that appear in our film, but also with our relationship and agendas with the camera and its recordings, and the editing process. Used transparently and reflexively, video has the capacity to create an honest and transparent research process that is grounded in relationships with participants.

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