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# Using a 360 degree camera as a mobile data collection method towards understanding information types and use in running.

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## Abstract

This paper presents a mobile data collection method using a 360 degree camera developed in an ongoing qualitative doctoral research project. The method captures audio, participant action and the running environment visuals of a situation in an immersive way compared to traditional audio-video capture. The method contributes towards an understanding of information types, use and value amongst those who run. This paper describes the mobile method, its research context and provides an insight to how the method has contributed to developing findings about information types and use.

## Introduction

Running is an information rich environment often combining embodied information (Allen Collinson, 2008; Cox, Griffin, & Hartel, 2017) and quantified information usually created by mobile technology (Kuru, 2016; Lupton, 2016; Wiesner, Zowalla, Suledar, Westers, & Pobiruchin, 2018) used over the runner's career (Stebbins, 2018). Following a meta-ethnographic literature synthesis (Noblit & Hare, 1988) of embodied information, leisure social worlds, and the quantified-self, preliminary research questions were asked of which the following is relevant to this paper:

**What types of information are used and how are they used by those that run?**

Within the literature, mobile methods were encountered such as 180 degree audio-visual recording methods to study runners (Cook, Shaw & Simpson, 2016) and cyclists (Pink, Samartojo, Lupton, & Heyes La Bond, 2017). Practical and observational difficulties in recording information use during a run were observed by Temir, O'Kane, Marshall, & Blandford (2016). Using a 360 degree camera addresses these difficulties and provides a novel method of capturing the visual environment of a run, the participant and their use of information and devices. The method contributes to the noted challenges of multimodal video and eliciting 'elusive knowledge' in qualitative research (Heath, Hindmarsh, & Luff, 2010; Toraldo, Islam, & Mangia, 2018).

## Methodology

Research is based upon situational analysis as a "theory/methods package" (Clarke, Friese, & Washburn, 2018, p. 24). Situational analysis aligns with the researcher's present epistemological and ontological stance influenced by Pragmatism (Rorty, 1982), symbolic interactionism (Rock, 1979) and assemblage theory (Deleuze & Guattari, 1988; DeLanda, 2006).

The University of Sheffield's Research Ethics Committee granted ethical approval prior to commencement of data collection. Data was collected through the researcher filming participants whilst running and simultaneously answering questions about the types of information they use. A 360 degree camera was used mounted on an extendable hand grip (figure 1), held in front of the participant and researcher whilst recording (figure 2).

[INSERT FIGURE 1 AND FIGURE 2 HERE]

After collection, the recording was interactively analysed in specialist video editing software for audio responses, non-verbal audio and visual cues, participant body movements and uses of technologies which the researcher did not observe during the recording (figures 2 and 3). The recording can be paused and rotated through 360 degrees to see what it is they are gesturing to.

[INSERT FIGURE 3]

The footage is then viewed in a virtual reality headset to immerse the researcher into the experience of the recording situation. The spherical panoramas of figures 4 and 5 portray a small sense of the visual data presented in the virtual reality experience. This two stage analytical process generated rich, descriptive audio and visual transcribed data for situational analysis. The resulting data were coded through Corbin and Strauss' inductive, constant comparative method (Clarke et al., 2018, p. 107) and then analysed through abstract situational, social arena/world and positional maps.

[INSERT FIGURE 4 AND FIGURE 5]

Data collection was stopped due to the Covid-19 pandemic, with only four participants purposively sampled from running clubs before analysis would begin to direct theoretical sampling. All participants were of a white ethnicity, in technical and professional occupations, ranging from 18 to 74 age groups, with three males and one female.

## Findings

The participants used embodied information instead of quantified information to guide their running as the recording run was not a part of their 'training' regimes. 360 degree audio-visual data revealed the constant use of embodied sensory information of the immediate environment during the run, typified by

scanning the terrain a few steps in front of them to anticipate their negotiation of the environment. Environmental effects, such as weather, provided embodied sensory information that the participants used to adjust their bodily movement to negotiate the run.

Information use from devices seemed to be low because the participants did not consider the recording run to be a 'type of run' that merited using device information. It became apparent that a 'type of run' and the 'type of runner' were the likely variable criteria for how information from devices were used in running. A 'type of run' became a line of questioning, to understanding how different 'types of run' have a bearing upon information use during a run. However, despite "not using" their devices, all participants ensured that they made 'a record of a run' through the action of pressing a button on a watch and at the start and end of the run. It was during questioning that participants also reflected upon their information use outside of the physical running situation, which became another emerging line of inquiry.

## Discussion

The preliminary findings are limited in that they are work in progress and based upon four participants of demographic homogeneity. The findings presented are a part of an ongoing situational analysis. Further research will increase participant numbers and diversity to strengthen the developing theory.

The method allows for a rich understanding of information use within running situations, providing further insight than face to face interviews. The strength of the method lay in revealing the tacit, yet observable participant use embodied sensory information connected to the immediate external environment, combining visual, aural and haptic information which may otherwise not have been revealed.

## Acknowledgements

## References

Allen Collinson, J. (2008). Running the routes together: corunning and knowledge in action. *Journal of Contemporary Ethnography, 37*(1), 38-61. doi:https://doi.org/10.1177/0891241607303724

Clarke, A. E., Friese, C., & Washburn, R. S. (2018). *Situational analysis. Grounded theory after the interpretive turn.* (2nd edition ed.). Los Angeles, United States of America: SAGE Publications, Inc.

Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: techniques and procedures for developing grounded theory. 4th edition.* Thousand Oaks: SAGE Publications Ltd.

Cox, A. M., Griffin, B., & Hartel, J. (2017). What every body knows: embodied information in serious leisure. *Journal of Documentation, 73*(3), 386-406.

DeLanda, M. (2006). *A new philosophy of society. Assemblage theory and social complexity.* London: Bloomsbury Academic.

Deleuze, G., & Guattari, F. (1988). *A thousand plateaus. Capitalism and schizophrenia.* (B. Massumi, Trans.) London, United Kingdom: Bloomsbury Academic.

Heath, C., Hindmarsh, J., & Luff, P. (2010). *Video in qualitative research: analysing social interaction in everyday life* (Vol. 23).

Kuru, A. (2016). Exploring experience of runners with sports tracking technology. *International Journal of Human-Computer Interaction, 32*(11), 847-860. doi:https://doi.org/10.1080/10447318/2016.1202461

Lupton, D. (2016). *The quantified self: a sociology of self-tracking.* Cambridge: Polity.

Noblit, G. W., & Hare, R. D. (1988). *Qualitative Research Methods: Meta-ethnography.* Thousand Oaks, CA: SAGE Publications, Inc.

Pink, S., Samartojo, S., Lupton, D., & Heyes La Bond, C. (2017). Mundane data: the routines, contingencies and accomplishments of digital living. *Big Data and Society.* doi:https://doi.org/10.1177/2053951717700924

Rock, P. (1979). *The making of symbolic interactionism.* London, UK: The Macmillan Press Ltd.

Rorty, R. (1982). *Consequences of pragmatism.* Brighton, UK: The Harvester Press.

Stebbins, R. A. (2018). *Social worlds and the leisure experience.* Bingley: Emerald Publishing Limited.

Temir, E., O'Kane, A. A., Marshall, P., & Blandford, A. (2016). Running: a flexible situated study. *CHI '16 Extended Abstracts.* San Jose: ACM. doi:https://doi.org/10.1145/2851581.2892385

Toraldo, M. L., Islam, G., & Mangia, G. (2018). Modes of Knowing: Video Research and the Problem of Elusive Knowledges. *Organizational Research Methods, 21*(2), 438-465.

Wiesner, M., Zowalla, R., Suledar, J., Westers, M., & Pobiruchin, M. (2018). Accuracy and adoption of wearable technology used by active citizens: a marathon event field study. *JMIR Mhealth Uhealth, 5*(2), e24. doi:https://doi.org/10.2196/mhealth.9623

[1322 words: title, abstract, text, references]