The Mindcam methodology: perceiving through the native’s eye
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Abstract
Purpose – Consumer researchers and marketing practitioners increasingly appreciate the potential of videography to generate better insights into consumers’ behaviours. The purpose of this paper is to introduce the Mindcam research methodology as an addition to the videographers tool-kit, which uniquely records and interprets videographic data from a first-person perspective.

Design/methodology/approach – The philosophical rationale for collecting observational data from the informant’s perspective is presented. A full description is provided of an innovative research method that allows market researchers to observe, record and interpret consumers’ experiences from the informants’ literal and figurative viewpoints. The technical and ethical issues that should be addressed when using this methodology are specified.

Findings – Observational research presently shapes and edits data as it is collected, filtering others’ behaviour through the researcher’s perspective to generate interpretive insights. Recording consumers’ lived reality, from their own unedited perspective, allows the consumer experience to be re-lived by the researcher. This assists in generating a negotiated interpretation of the consumer’s reality. Findings are not constrained by the researcher’s perspective of the informants’ reality.

Originality/value – This new method integrates own-perspective videography with post-hoc visual elicitation, thereby generating informant-driven perspectives of their own lived consumption reality. Dual-mode presentation of the data (original experience with the informant’s interpretation) enables viewers to judge the truthfulness of the interviewer-informant negotiated interpretation of the informant’s lived consumption reality. Enough information is provided for others to employ the Mindcam method in their own research.

Keywords Visual perception, Ethnography, Qualitative research, Consumer behaviour

Paper type Conceptual paper

Introduction
Consumer researchers and marketing practitioners increasingly appreciate the potential of videography to generate insights into consumers’ behaviours (Belk and Kozinets, 2005). Videography, although superior to photography and verbal descriptions in capturing consumers’ lived experience, remains a representation of reality. In traditional videography, an active videographer, knowingly or unknowingly, is a filmmaker or auteur, analysing and filtering the situation as the film is made. As such, the representation recorded is, in Peircean semiotic terminology (Merrell, 1995), a second-order image – an incomplete image of the reality as perceived by the videographer.

In this paper, we introduce the Mindcam research methodology as a way to introduce the first-person observational perspective to the collection and analysis of video-recorded data. We first explain the theoretical rationale for seeking a first-person perspective understanding of reality, explicating why current videographic methods should embrace this goal. We then explain the Mindcam methodology, noting the
technical and ethical issues that users must consider. We conclude with a discussion of the advantages and limitations of the Mindcam methodology.

Philosophical underpinnings

The first-person perspective

The ability to step into another’s shoes is a repeated theme in popular art, seen in Mark Twain’s *The Prince and the Pauper*, The Hayley Mills Show featuring interchangeable identical cousins, and the film *Being John Malkovich*, in which ordinary people are transported inside the actor’s head and life. Achieving insights into other’s lived realities from a first-person perspective can be a major goal of qualitative research. Most qualitative researchers seek to observe from the perspective of a trained outsider, while interpreting context from the perspective of their informants. Negotiating this complex dialectic between etic and emic perspectives is a perennial challenge as researchers seek to understand other selves and contexts.

Bridging self and other

The issue of the researcher and his perspective has been carefully explored in anthropology. The dominant ethnography paradigm has strong ties to Malinowski (1922), who viewed anthropological encounters as a dyad. The researcher is a conscious outsider (self), and the individual or culture under study is an insider or native (other). Contrast between the outside and inside perspectives, at both the individual and cultural levels, should lead to greater insight, because differences are highlighted. Naturalistic inquiry within marketing has accepted this idea that contrast in research domains can lead to revelatory insights (Belk et al., 1989).

For Malinowski, the concept of a “native anthropologist” would be contradictory: a native is too inside his own context to step outside and reflect in an objective way. Although there are significant conceptual problems with this self-other dichotomy (Bakalaki, 1997; Pirsig, 1974), an assumed difference and distance between the observer and the observed remains as an implicit assumption of much ethnographic fieldwork. Responsibly bridging this gap between observer and observed has been described as one of anthropology’s “most persistent dilemmas” (Bunzl, 2004, p. 441). Victor Turner describes both aspects: his initial observations of Ndembu culture made him feel like he was “on the outside looking in” (Turner, 1969, p. 7), but prolonged engagement allowed him to understand Ndembu rituals from the “Ndembu point of view” (Turner, 1969, p. 11). Thus, naturalistic researchers acknowledge the need to understand consumer behaviour from the “inside-out” or a first-person perspective. To gain useful qualitative insights, we must work with this dichotomy.

Issues of representation

Representation, or representation, as Grayson (1998) terms it, is key to communication. As Grayson (1998) explains, in Peirce’s view, when we observe a real entity, it appears as “a sign in our mind’s eye” that is once-removed from reality. Accordingly, any depiction we make of what is observed is an imitation of how reality appears, and thus, twice-removed from reality. This is an intriguing paradox for researchers: the more realistic our depiction, the more likely it is that the receiver will forget that the depiction is not reality. In Peircean terms, the sign becomes confused with the original, a process termed degeneration (Merrell, 1995). Thus, video, being the most realistic
medium presently available, also has the highest potential to exhibit degeneracy. Video, like photography, has a high degree of facticity. Although the video is a text, observers can be easily confused about its nature. An analyst must look explicitly at the text \textit{per se}, but video is so realistic that it can lead observers to look “through” the text, and feel that they are experiencing the reality it depicts (Sontag, 1977). Understanding the creation process underlying the video text is essential to using it effectively as a qualitative research tool.

In traditional videography, an active videographer chooses what subjects to film, and makes many ongoing decisions on particulars about how to film them. The videographer is a filmmaker or auteur, and is implicitly analysing and filtering the situation as the film is made. This makes for more interesting viewing, but the resultant video is now quite removed from the subject’s own perceptions of reality. The video is the third-party observer’s edited depiction of someone else’s lived reality. Comparing the videographer’s depiction to the subject’s experience, there are inherent differences in physical and emotional perspective, what is attended to or ignored, and relative emphasis of different elements in the situation. The ability to get closer to the original lived experience would clearly help us understand in new and valuable ways.

\textit{Need for the first-person perspective}
Since, observers inherently have a third party perspective, they cannot see or experience reality in the same way the experiencer does, nor interact with the environment in the same way. And unfortunately, due to the particularly rich depictions of reality captured by the videocamera, viewers are apt to forget that the lens only captures part of reality. Consequently, when trying to understand others’ perceptions from the inside out, we believe it is particularly critical that videographic data be collected from the first-person perspective. We believe that our Mindcam methodology offers a solution to the problem of recording data from a first-person perspective, while simultaneously allowing the researcher to participate in a negotiated interpretation of that data.

\textbf{The Mindcam research methodology}
The Mindcam is a new video-based approach that we believe offers substantial methodological improvements over previous observation methodology. This method passively and unobtrusively collects rich, objective observational videos of consumer behaviours, uniquely filmed from the consumer’s own point of view. The actual video is then used as a stimulus during a videotaped depth interview with the consumer, resulting in a unique process for achieving a negotiated interpretation of the consumers’ lived reality. Since, recognition is a more sensitive and discriminating measure of memory than recall (Singh \textit{et al.}, 1988), providing a video stimulus that incorporates visual elements including colour, motion, and sound can stimulate various types of processing and rekindle a range of memories that would otherwise remain latent.

The Mindcam employs highly technical equipment, but the essence of the method is conceptual. Insights are derived not from the specific equipment, but from the conceptual manner in which it is used. There are two fundamentals to the Mindcam concept:

\begin{enumerate}
\item video is passively collected from the subject’s point of view; and
\item interpretation uses the video as a prompt to elicit the respondent’s reactions.
\end{enumerate}

Within these parameters, the type of video equipment used is quite mutable.
Research apparatus

The collection apparatus consists of concealed video equipment, using a small, battery-operated pinhole video camera and microphone mounted in an unobtrusive, nearly invisible way. The camera moves with the person and requires no attention or effort to operate. The camera is mounted either on:

- the consumer’s head by concealing it in a hat or eyeglass frames; or
- the consumer’s body by concealing it in a handbag, or other object such as a button, piece of jewelry or cellular phone housing.

The video camera and microphone are connected to other required hardware such as a battery, video recorder or video transmitter. If desired, binaural microphones can be used to capture a stereo soundtrack with the ability to precisely localise sound sources when replayed. When in use, the apparatus captures an exact and objective record which is similar to the subject’s own fields of vision and hearing. This includes the subject’s own behaviours, any interpersonal interactions the subject may have, details of the visual and auditory experimental environment, a record of spatial movements, and an accurate record of elapsed time, all from the consumer’s point of view.

Video technology is now smaller, lighter, cheaper, better quality, and more reliable than our initial prototypes. Technical improvements in the future will be readily compatible with our methodology. The Mindcam technique can be used in wired or wireless form. It can be viewed by the researcher in real time via a wireless transmission for building a grounded theory (Glaser and Strauss, 1967), recorded for later analysis, or both. The camera can be placed anywhere on the subject’s person, as long as it captures some aspect of the subject’s point of view. Multiple cameras on the same subject are feasible, as is the addition of GPS location equipment to track the exact location of a subject in terms of XYZ coordinates. The camera can be any video system (PAL, NTSC, SECAM, third generation cellphone or computer formats), and the recording can be made on any video medium (videotape, DVD, memory cards, or hard-disk based recorders such as the video iPod). The equipment required for the Mindcam has become commonly available, off-the-shelf technology which is accessible to any interested researcher.

Research procedure

We employ three distinct stages in a Mindcam research project. After the research domain and issues are established, the first stage is recording video data from the informant’s point of view. When this is complete, the second stage uses this first-person video as a memory prompt in a detailed and videotaped interview with the informant. The third stage is final analysis, editing, and presentation of the findings.

In the first stage of the research, the consumer is outfitted with the video apparatus (the “Mindcam”), and the camera is aimed to approximate the informant’s field of view. In an experimental setting, the subject is typically instructed to undertake a particular task in a chosen environment, and engages in this task while wearing the Mindcam. Our current version of the Mindcam uses a full-colour, full-motion video camera about the size of a postage stamp with an easily concealable pinhole-type lens. The attached digital video recorder will capture up to 90 min of high-quality video without interruption, which allows for extended behaviour analysis. Hard-drive based audiovisual recorders will allow longer recording periods if required. This apparatus
records exactly what the consumer does, in a detailed and objective manner, from the consumer’s point of view. Because the camera is mounted on the consumer facing outwards, it objectively records visual, auditory, spatial and temporal information.

As the research task unfolds, the Mindcam records approximately what consumers see, what they hear, what they say, where they move, how long they spend in each area of the premises, what they touch, what they do purchase, what they do not purchase, what they say, and how others interact with them, environment atmospherics, and so forth. Importantly, however, the Mindcam records everything that is visible and audible from consumer’s point of view, including a range of stimuli that were present but either not perceived or not remembered. This can offer unique insights into selective perception and memory processes. If desired, the consumer can be instructed to provide verbal protocols as they engage in the task, and these will be recorded automatically. The outcomes of all behaviours that are visible from the camera angle are captured, regardless of whether the consumer’s motivations are conscious or subconscious. An exact map (both spatial and temporal) of the interface between the consumer and the research environment can also be produced.

After the experimental task is complete, the second stage involves interviewing the consumer. The consumer watches a video replay of his previous task while being interviewed, and this interview is also videotaped. This is a modification of a photelicitation technique called autodriving (Heisley and Levy, 1991), which uses still photographs of the respondent taken in a research context as interview stimuli. However, our method differs in intent; for while Heisley and Levy (1991) used photelicitation as a projective stimulus, we use video elicitation as a memory prompt. In addition, Heisley and Levy (1991) used researcher-generated stimuli, while we advocate the use of informant-generated stimuli.

When the task and interview videos are combined, we obtain a stimulus-aided time-synchronised record of the consumer’s unique experience including thoughts, feelings, and observations. In the third stage, the videos are edited, with analysis and commentary added as appropriate, and integrated into a picture-in-picture display with associated text. This simultaneously shows the original video of objective consumer behaviours, video of consumers’ subjective commentary on the experience, and independent analysts’ observations on the same experience. The triangulation of this information – the record of the task, the prompted post-task interview, and the analyst’s impressions – allow us to better understand the consumer’s perceptions, feelings, motivations and thoughts, and how these may have affected their behaviour.

**Initial tests of the methodology**

The Mindcam has been developed over a period of years, and undergone a number of pre-tests to assess usability and reliability, and to develop experimental procedures. The first major trial was conducted as a proprietary commercial market research study at a large shopping mall. The mall owners sought to understand how customers navigated within the shopping centre, and what effect this was having on sales in particular areas of the mall. The authors were also interested in the robustness of the technique, in fine-tuning the analysis of the data, and in exploring the capabilities and limitations of the Mindcam in a real-world setting.

Consistent with other qualitative methodologies, the study relied on a small number of subjects (ten) whose attitudes, behaviours, and feelings would be explored in-depth.
Recruitment was carried out by random-digit telephone dialing within the centre’s catchment area. Respondents were screened to fall within the centre’s prime target market (females aged 18-54 years who had shopped at the centre within the past 6 months). Those respondents who met the demographic criteria were offered the opportunity to participate in a shopping study and would receive a $100 voucher good at any shops in the mall. Subjects were informed that the shopping centre had granted permission for the videotaping, and shown the Mindcam equipment. All agreed to participate, and each was given the $100 voucher with instructions to spend as much or as little of it as they chose. The remaining funds belonged to the respondents, and could be used on a future shopping trip.

The study was exploratory in nature: the shopping centre management had detailed data on store-by-store sales, but had formed no working hypotheses about the effects of navigation and mall geography on store sales. Subjects were fitted with the Mindcam concealed in a baseball cap, and attached to a small digital video recorder in an unobtrusive shoulder bag. Each woman sent shopping by herself, with instructions to walk past or through the geography of interest, but otherwise to shop as they normally would, and to return within 1 h. All subjects successfully completed the shopping task and debriefing interview process, and there were no equipment failures.

Upon the subject’s return, an individual videotaped interview was held in a small conference room. The respondent’s Mindcam tape of their just-finished shopping trip was shown as a prompt. Two interviewers viewed the tape along with the respondent, and asked questions to clarify what the respondent was doing, thinking, or feeling at a particular point in the shopping experience. A video camera was used to film the respondent’s face and body language as she watched her shopping trip played back.

The validity of the technique is enhanced by several aspects of the technique. Each respondent is shown a rich stimulus of her previous experience. The videotape is automatically complete, properly sequenced, and holds a myriad of detail. As a result, the effects of selective attention and selective memory are short-circuited: if the action is on the tape, it occurred, even if it might not be recalled in an unprompted interview. The use of two interviewers allowed for different perspectives in the questioning. We found that the tapes elicited very rich responses from the respondents. They were able to talk in great detail about what they were doing, deliberating about, or feeling. This may be due, in part, to the highly visual nature of the stimulus. The tapes offer an interesting self-referential feature: they are an exact but highly accessible script of a recent experience. Because the Mindcam tapes are sequenced, highly detailed, and seen shortly after the experience, they are able to evoke very clear responses from the subject. No respondents noticed any part of shopping the trip that they did not recall. However, many spontaneously noted that there were aspects of the store environment that they had not attended to in the store, but did notice when shown the tape afterwards. In particular, the stores’ background music seemed to be more noticeable on the videotape than it had been in the stores themselves.

For final analysis, the researcher has a rich set of texts to work with: the tape of the experimental experience, the respondent’s spontaneous reactions to the tape of the experience, and the respondent’s answers to specific questions asked by the interviewer. These can be analysed according to the researcher’s own approach. For example, we augmented the qualitative insights with a positivist quantitative analysis of the number of stores entered, the amount of time spent in each, and the number of
purchases made. Different units of analysis can be chosen in a retail setting: for example, one can analyse at a store level, or by the number of product categories a shopper browses, or by the brands that apparently enter her consideration or purchase set.

Issues to be considered

Verisimilitude

It is easy to videotape an environment, but it is impossible to reproduce that environment in a way that exactly matches human perception. The Mindcam can only approximate a human point of view, and understanding these perceptual differences is an important part of analysis and interpretation. We have found several specific issues worth noting. The overall impression of an environment is captured well. The timing of events is captured exactly, which is a major improvement over fallible recollections of time. Colour, motion, spatial movements, and general auditory impressions are also well represented.

Estimates on the width of the human vision field vary, but it is clearly wide: horizontal coverage including peripheral vision is approximately 150° for a single eye, and 198° for both eyes (Howard and Rogers, 2002). The way we attend to objects in the central and peripheral visual fields is difficult to translate directly to photography or videography. The angle of view for a typical pinhole video camera is approximately 90°: much narrower than human peripheral vision, equivalent to the very widest still camera lenses, and far wider than the typical video camera. The image from these cameras is sharp from edge-to-edge, which appears more like central than peripheral vision. Despite all of these variables, we find that these wide-angle video cameras, mounted near the eyes and used at a short distance, capture a reasonable approximation of what we typically perceive. All informants recognise the experimental environment they visited, and in all cases the Mindcam tape has served as an effective memory prompt.

Some aspects are portrayed with less verisimilitude. All video appears more two-dimensional on playback than the real environment, because it lacks the depth perception provided by binocular vision. The relative level of different ambient noises is modified. Some noises are amplified, others attenuated, and all of these effects can be different from the informant’s perceptions. Some sensory cues, such as smells, temperature, and tactile cues, cannot be captured at all.

Aiming and parallax

The high-technology component of the Mindcam has continued to become more reliable. The most persistent challenge with employing the technique is a low-technology concern: positioning the camera securely, and aiming it properly. We have generally used the camera in a baseball cap, which attaches fairly securely to the informant’s head. The bill of the cap provides a useful visual cue for how the hat should be positioned. Prior to the research task we put the hat/camera on the informant, connect it to a video monitor, and adjust that hat until the camera’s viewpoint approximates the informant’s viewpoint. Slippage and maladjustment does occur, but the wide angle of the camera allows some latitude for misalignment. Cameras can also be mounted on the body, in a bag, or on a strap. These body-mounted locations are more stable, because the torso moves less than the head. They are also more difficult to align properly.
There are also some modest parallax issues: when worn in a hat, or on the informant’s torso, the camera does not line up exactly with the wearer’s eyes. This generates a point of view somewhat different than what the user perceives. An elegant solution to this is a nosebridge-mounted camera, which solves both the aiming and parallax problems. At present, such cameras are expensive and offer lower resolution, but they are a feasible alternative.

**Visual scanning**

One human function that the Mindcam cannot mimic is eye motion. Human eyes move constantly, whereas the Mindcam is fixed, and moves only when the wearer’s body moves. This raises the issue of whether the Mindcam is capturing what the informant is looking at. Our qualitative assessment indicates that it does. In general, people do turn their heads to locate an item or to navigate, but will realign their body, usually with neck approximately straight and eyes forward, to look with any object of longer-term interest. Under these conditions, the Mindcam does capture what the informant is looking at, and usually takes in even more unattended-to information than is actually in the viewer’s non-central visual field. We have encountered no instances in which our triallists claimed that their object of interest was outside the view of the camera.

**Legal issues**

The Mindcam has developed in a time when technology has advanced more rapidly than the law. In general, the legal latitude for using Mindcam is quite broad. In the USA, with few exceptions, any person or thing may be filmed without permission in a public place, regardless of whether the camera is hidden or visible. People can be filmed on private property with the permission of the property owner (Krages, 2002). In the UK, laws are similar, and rights to privacy by individuals are somewhat limited (Macpherson, 2004). This allows broad scope to videographers. Undoubtedly, there are other countries where the use of such equipment is highly illegal. Legal issues vary substantially internationally, and these issues must be researched carefully before the technique is employed.

**Ethical issues**

Although there is broad legal latitude for using the Mindcam, there are serious ethical issues to consider. Some researchers have expressed concern about the ethics of employing hidden cameras (Hirschman, 1986). Belk and Kozinets (2005), in discussing our technique, rightly pointed out the need for good research ethics protocols. We agree. The observational research guidelines set out by market research societies (Market Research Society UK, 2002) are quite suitable to protect the interests of research respondents, non-participants who are inadvertently filmed, and researchers. Stipulations include clear disclosure about the purpose and rationale of the research provided to respondents upon recruiting, legible signage about the filming placed in the experimental area, permission of respondents to show tapes, and compliance with applicable laws (Data Protection Act (UK), 1998). At the same time, it should be recognised that filming for Mindcam purposes has not yet been specifically considered by market research societies, and there are areas which remain unclear.

We also recognise that there are emotional reactions to the idea of hidden filming, as it can sound voyeuristic or inappropriate. In some cases, we believe it can be inappropriate.
For example, there are explicit guidelines for hidden filming of mystery shopping (Market Research Society UK, 2005, pp. 14-16). Although we concur with these guidelines, we have chosen not to employ Mindcam for the observation of dyadic exchanges because of potential ethical and epistemological problems. Ethical violations can occur if the dyad is the explicit unit of observation, and one party is not informed. However, epistemological problems can occur if one or both parties are informed. Under these circumstances, there is a significant chance that behaviours will be changed as a result of disclosure, potentially negating the purpose of the research. Although such research can be carried out legally, and in compliance with ethical guidelines, we still prefer not to use the Mindcam in questionable areas. We have tried the Mindcam in less contentious ways, with respondents and property owners fully informed. In general, both respondents and viewers find our actual tapes or respondent behaviour to be quite innocuous.

The Mindcam can easily be used in a non-hidden manner if desired. This resolves the potential ethical issue of covertly filming third parties without their knowledge, but it creates epistemological problems. Non-hidden videotaping is intrusive, can make subjects feel uncomfortable, and does change behaviours. Habituation to the taping process will reduce these effects, but is unlikely to eliminate them.

It should be recognised that this technique is developing at a time when the context of filming human behaviour is changing rapidly. In many countries, technology now pervasively films our everyday activities outside the home. Many of these cameras are unobtrusive or hidden, and few have explicit signs. London, for example, has over 500,000 security cameras, and studies find that an average person may be filmed up to 300 times per day (Stecklow et al., 2005). Worldwide concerns about terrorism have also led to greater public awareness of video and photographic surveillance, greater legal latitude to employ it, and even to greater suspicion of tourist videography, as it might be used as reconnaissance for future terrorist attacks.

Although we may reasonably expect a modicum of privacy in public, this is often unavailable. Researchers are currently using a considerably higher standard of conduct than the law requires, and this also leads to an asymmetry. Explicit signage is required for research to understand human behaviour, but minimal signage is needed to allow covert security camera filming for behaviour modification (e.g. discouragement of shoplifting) and legal enforcement purposes. We must recognise that cultural and legal contexts vary substantially, and they do shift over time. This will, and should, affect how we use videography and the Mindcam for research purposes.

Concerns for informant privacy
We believe that the ethical and privacy issues of using the Mindcam are situation-dependent: they vary according to the unit of analysis and how the tapes are employed. The informants do not actually appear on the Mindcam tape: only their hands, speech, and the locales they visited are recorded. Because the informants are fully informed about the filming, whether in public or private spaces, there is little concern about the invasion of their privacy. Our pre-tests have indicated that informants themselves are relatively comfortable with the process. All informants reported that self-consciousness about wearing the equipment faded quickly, and that it did little to change their normal behaviours. None expressed concern that it would violate their own privacy, and none showed discomfort on viewing the tapes.
Despite the concerns expressed by Belk and Kozinets (2005), our pre-tests indicate that delicate situations rekindle awareness of the equipment, allowing informants respond appropriately. One of our informants went into a dressing room, and, as previously instructed, covered the camera to protect her privacy.

**Concerns for bystander privacy**
The biggest ethical issues are not with the informant, but with those bystanders who are incidentally captured on tape. Our research focus has been on the actions of the informants themselves. The actions of non-informants caught on camera are treated as inadvertent artifacts of this particular research, and not analysed. Nonetheless, we have ethical and epistemological concerns about filming others as a main focus of research, and our informants were also conscious of the issue. It is clear that in dyadic interactions, self-consciousness about wearing the Mindcam will change respondent behaviour. At the same time, the Mindcam is rarely noticed by third parties, even in close encounters, and therefore has much less direct impact on their behaviour. The effects on the dyad are therefore asymmetrical: large on the respondent, but smaller on the third party. This is likely to affect research findings in unpredictable ways. Our preference is to avoid the use of this technique for analysing dyadic interactions altogether. If interactions with others are a unit of analysis, then all parties should be explicitly informed that such research is taking place, and the guidance of a human subjects committee should be sought. Although this research process is less blind, it does offer the opportunity for thorough analysis of both sides of the dyad in the interaction.

Inadvertent filming of others, where their appearance is an artifact of the process rather than its main focus, is less of an issue. Our main use of the technique is to film public behaviour in public or quasi-public spaces such as shopping malls. Most people in these spaces behave within accepted social norms, and there is little concern about invading their privacy under such circumstances. After filming, the tapes are typically seen only by analysts in a private setting, greatly limiting any potential for harm. Furthermore, the identity of non-informants appearing on the tapes can be easily disguised with editing processes if required.

Ultimately, the ethics of using the Mindcam technique are dependent on the ethics of the researcher. As with any video, whether overt or concealed, we can assemble a sensitive and insightful analysis that respects all of those portrayed, or we can create a misleading and offensive parody. The outcome relies on the taste and concern of the researcher using the technique.

**Advantages of the Mindcam**
*An unobtrusive first-person perspective*

Some researchers have held that visually recording behaviour is too intrusive (Hirschman, 1986), and will change the behaviour being observed. Others have found intrusiveness to be a minor issue (Belk et al., 1988). These concerns, that the method employed might change the phenomenon under study, fall into three areas: type I – direct effects on the respondent (self-consciousness of the respondent changes his behaviours), type II – direct effects on others the respondent interacts with (their self-consciousness changes their behaviours), and type III – interaction effects (self-consciousness by one party results in different responses by another party).
We believe that the Mindcam research method answers many of these concerns. On type I concerns, we have found, in pre-tests, that any self-consciousness by the respondent fades quite quickly, consistent with Belk et al. (1988). This also accords with adaptation-level theory (Helson, 1964), which posits that any stimulus experienced repeatedly (such as wearing the Mindcam) is adapted to, and then perceived as neutral. With the Mindcam, type II concerns (self-consciousness on the part of others) vanish: the device is so unobtrusive that others are unaware of its presence. Type III concerns do occur. Respondents have noted that when they interact with others, their consciousness of the Mindcam device is rekindled. Generally, however, these concerns fade as it becomes clear to respondents that others are unaware of the device. Nonetheless, the type III interactions, combined with the possible ethical concerns of taping others while unaware, make interaction tasks a less suitable application for the Mindcam.

An unedited, unfiltered record
Our technique is philosophically different from traditional videography. The camera is passively attached to the respondent, and requires no attention or adjustment. The tapes that result are unfiltered and unedited records of what the respondent did and saw. When a respondent behaves naturally (as they typically do), there is no active selection of subjects or point of view. The sequence and timing of events is unaltered, and no exogenous elements are added. This means that our original source tapes are tedious if watched as cinema, but exceptionally valuable if used as a data source or memory prompt for respondents. The Mindcam captures all possible data in an unfiltered way. If new research questions occur post-hoc, all the information to explore them already exists. This cannot be done with a selectively shot video.

A versatile research methodology
Because the equipment is unobtrusive and portable, the task can occur in real-world settings just as easily as in the more usual artificial experimental environment. Analysis can be conducted by researchers in any field, using a range of different analytical approaches. For example, an ethnographer can combine his own first-person observations, and those of others, with insights gained from interviewing respondents. An experimental researcher can recode behaviours, and do statistical analyses on the frequency, duration, and interaction of events. A geographer can look at spatial movements, a social psychologist can analyse personal interactions, and so on. Any of these researchers have the ability to replay the original respondent’s activity tape, in combination with the interview tape, to clarify observations. This can improve the accuracy of the research, as we are no longer dependent on capturing an ephemeral moment of behaviour as it happens.

A rich record of behaviour
Observational research can provide a rich record of human behaviours. This has been explored in commercial ethnography (Underhill, 1999) using traditional observers making written records of behaviour. The Mindcam tapes can be recoded in similar fashion, but offer an improvement because they capture data that is too complex to code in real time. We capture not only an informant’s actions, but also factors as varied as the look and feel of lighting, the aesthetics of an environment, the nature of sounds
and music, the stillness or business of the setting. The sequence, timing, and spatial occurrence of behaviours is captured in exact detail. All of these observations are also unique when captured via Mindcam, as only this technique offers perceptions from the informant’s point of view. For example, one of our trialists was quite short. Her difficulty in seeing and reaching products was made dramatically clear on the Mindcam tape, in a way that a taller observer would never understand as an outside onlooker.

A verifiable record of behaviour and perceptions
Regardless of their epistemology, all consumer researchers must develop records of behaviour that are acceptable within their particular paradigm. Hence, positivists seek “valid” and “reliable” records of behaviours, while qualitative researchers and ethnographers seek “truthful” records of behaviours (Lincoln and Guba, 1985). Most researchers, to a greater or lesser extent, also depend on self-reporting from respondents (Woodside and Wilson, 2002). Recent findings comparing objective records to subjective recall (Woodside and Wilson, 2002) indicate that respondents’ self-reported buying activity can be quite inaccurate, calling into question the veracity of research based on self-reported information (Kover, 2002). The Mindcam produces a recording which can wholly or partially replace self-reporting with more accurate measures of observed behaviour.

The Mindcam research methodology also uses triangulation to improve verifiability. The first-person recording is integrated with the interview recording, and also with the analyst’s interpretation. This provides three different perspectives. Since, the final viewers see both recordings simultaneously, they can judge for themselves whether the receiver-informant negotiated interpretation of reality is reasonable. Even more viewpoints can be added to the interpretation if desired. The events on the Mindcam recording may be supplemented with other forms of third-party recording, such as traditional videography or security camera footage. This multiplicity of viewpoints can greatly strengthen our understanding.

The ability to compare objective records of environmental stimuli to remembered impressions of those stimuli can also be quite valuable. It provides insights into human selective perception and memory processes. The Mindcam tape presents a wealth of information, and typically informants only recall a small portion of the stimuli on tape. However, through the negotiated interviewing process, we can develop a vivid understanding of what the informant perceived. With the tape as a memory prompt, and the interviewer as an insightful guide, and the impressions of the informant, there is the opportunity to triangulate and develop good insight into perceptions as well as behaviours.

Limitations
Loss of external physical cues
The inside-out perspective adds a great deal of data, but does have some losses. We see what the informant sees, hear everything they may say (including verbal protocols if they are so instructed, and ambient noises), and can watch much of what they do, but we do not see what the informant looks like while doing it. The Mindcam does not capture informants’ facial expressions or body language while they are engaging in the focal activity. Because this issue is unique to the Mindcam first-person approach, we
are unaware of any prior studies that have explored these limitations. If desired, the addition of traditional videography, or adding security camera footage from a retail setting to the Mindcam technique, is a perfect complement that will overcome this loss of information. Although the Mindcam cannot capture many physical aspects of the respondent, this is mitigated somewhat in the interviewing process. As the Mindcam tape is replayed, we do capture the informant’s facial expressions and body language on video.

**Vertigo**

None of our triallists reported any negative experiences related to wearing the Mindcam equipment. It is small, lightweight, and has minimal chance of any unpleasant effects. However, we anticipate that a small percentage of informants might experience some minor vertigo when watching replay of their tape, because of a difference between human and machine perception. The eye and brain employ complex mechanisms of eye movement and visual processing to give the impression of a stable visual image as we move. Although our heads bounce markedly as we walk, this is not perceived. Visual image compensation leaves the impression that we move smoothly, like a plane or ship. When a video camera is head or body mounted, there is no compensating movement of the optics, nor processing of the visual image. The image that the informant perceived via eye was stable, but the replayed video image of the same scene can wobble substantially.

Vertigo induced by video playback has been noted in other contexts, and specially designed tapes have been shown to induce vertigo experimentally in motion-sensitive subjects (Dobie and May, 1990). There is no direct solution to this problem. The interviewer must immediately stop playback if any discomfort occurs from the informant. There is an effective alternate interviewing technique which can be used as an alternative. The interviewer can prepare still images from the video and use these as memory prompts. However, use of this technique for only some of the respondents does mean that the interviewing protocol will vary between subjects.

**Potential for future research**

Our initial interest in the Mindcam has been to develop and demonstrate the methodology. There is now the potential to apply it to more substantive marketing problems, especially in complex *in vivo* environments. The Mindcam provides a complete record of even complex environments, and as such is a very strong stimulus to memory. The ability to juxtapose a full and objective record of an environment with a respondent’s perceptions and recollections of that environment makes the technique well-suited to studies of selective attention and memory effects.

Verbal protocols can be used as the subject undertakes a task (giving contemporaneous insight into thoughts and feelings, but potentially interfering with those thoughts and feelings by requiring verbalisation). The Mindcam, uniquely, can do a form of *post-hoc* verbal protocol: as the tape is replayed, the subject can narrate what was going through her mind as the actions occurred. In this context, the *post-hoc* protocols may be somewhat less precise, but they have the significant advantage of having no effect whatsoever on the experimental thoughts or behaviours.

Store atmospherics, and the analysis of other environmental influences, are another logical application for the Mindcam. Appearance, ambient sounds, lighting,
visual properties, colour, and physical layout are all captured on the tape, and can be manipulated if desired. How a subject responds to them can be assessed with classic experimental design.

Finally, the Mindcam is highly portable, which means a study can be conducted in as broad an area as desired. Studies of wayfinding, and how subjects use cues to navigate in marketing environments, are logical uses for the technology. The ability to track movements via GPS satellite systems could be a useful quantitative adjunct to this approach.

Conclusion
We see this technique as a useful addition to ethnographic filmmaking, but certainly not a replacement for it. Each technique has different benefits and shortcomings. A film-making approach is better for understanding the narrative, conveying a rich understanding of a subject, and sheer watchability. Our technique is better for understanding precise details, exact cognitions, differences between perceptions/recollections and reality, and respondent thoughts and feelings about the processes portrayed. Different research applications will find one of the techniques more appropriate. There is considerable scope to further develop the method, particularly in the interview process using video elicitation. After substantial development, we believe the Mindcam technique is now ready for use in substantive research, and we encourage other researchers to employ the Mindcam technique where appropriate.

References


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