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Working Paper 148: A Method for Capturing Movement and Touch-Based Interactions During Ethnographic Fieldwork

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A method for capturing movement and touch-based interactions during ethnographic fieldwork.

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Abstract:

This paper introduces a paper and pencil-based method for capturing naturally occurring interactions in ethnographic fieldwork notes where no electronic (audio / video) recording equipment can be used. The method was developed for a study exploring the practical accomplishment of hospital-based physiotherapy education. Physiotherapy is a movement and touch-based healthcare profession where students learn by shadowing and co-working with qualified therapists. To observe real time placement-based physiotherapy education it was important to capture the non-verbal and physical (contact and spatial), as well as the verbal elements of the observed interactions. The method is based on Laban-Bartenieff Movement Analysis and the work of Birdwhistell, Heath, and Goffman and captures the minutiae of some elements of participants' interactional use of gaze and space. This paper describes the development of the method and illustrates its use in the context of hospital-based physiotherapy education.

Key words: movement, touch, ethnography, practical accomplishment, physiotherapy

Acknowledgements:

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Introduction

This paper introduces a new method for recording, in real time, the movement, touch and spatial elements of naturally occurring interactions in ethnographic fieldwork. The method was developed and tested during an ethnographic observation of hospital-based student physiotherapy education. Physiotherapy in the UK is defined as 'a healthcare profession which emphasises the use of physical approaches in the promotion, maintenance and restoration of an individual's physical, psychological and social well-being' (Chartered Society of Physiotherapy 2002, p. 19). The 'use of physical approaches' in this definition refers both to the therapists' use of their own bodies to move, support and resist the movements of their patients, and to their selection of other physical resources, for example water, equipment, heat and other electrical therapies, to help maintain or restore patients' movement and function. Figures 1 and 2 offer some examples of physiotherapy practice.

Figure 1: A ward-based therapy session to help a paralysed person cough.

In Figure 1 the therapist is using her hands to act as the patient's (paralysed) abdominal muscles and force air through his mouth as if in a cough. Timing her hand movements to the patient's breathing pattern is crucial. The therapist is watching the patient's face closely while he gazes towards the ceiling.

Figure 2 illustrates how two therapists work together to maximise patient movement. In Figure 2 a physiotherapy assistant (in blue) holds one of the patient's legs while the physiotherapist stretches out the muscles on the back of the other. The therapist is sitting on the plinth with the patient's foot on her shoulder. Out of shot she is holding his bare foot and applying a downward force to stretch his calf muscle. The amount of force she applies must match the amount of resistance the patient's muscle is offering. The therapist is concentrating and looks down at the patient's leg.

Figure 2: A gym-based therapy session.

In both Figures 1 and 2 the therapist is applying physical force through her own hands to effect change in her patient's body. While therapy may not always be contact-based, elements of most physiotherapy interactions involve both the observation and touch-based movement of an appropriately exposed human body.

The nature of the data collection challenge

Pre-registration physiotherapy students spend a minimum of 1000 hours learning in placement settings. Despite its significant contribution to students' learning, few studies have attempted to describe the real time practice of placement education. The study for which the new method was developed sought to describe placement education practice in two physiotherapy settings in one hospital by observing six final year students on placement. Visiting students are placed alongside practising therapists and learn by shadowing the staff as they work before taking over, under supervision, a small patient list of their own. An ethnographic observation of placement-based physiotherapy education thus required the ability to record the physical contact and movement-based interactions of naturally occurring physiotherapy to real patients in hospital settings. In order to cause as little interference as possible to the patients and interaction settings while following a therapist and student throughout their working day, it was agreed that no electronic recording equipment would be used in patient settings. Before entering the field therefore I needed to find and practise using a pencil and paper based method for accurately and robustly recording physiotherapy interactions.

Ethnographic observation in healthcare and education settings

There is a rich and varied tradition of ethnographic observation in hospital and community-based healthcare settings. Exploring this body of research in preparation for my fieldwork emphasised the need to capture the 'contours of [the] culture' I was observing (Atkinson et al. 2008, p. 146) as well as the seemingly obvious verbal features of the interactions. Making visible the 'contours' of the observed interactions locates the participants in the context of their place, spaces, artefacts and time and enriches the fieldwork data. Given that my study was to observe educational practices in hospital settings, I focussed my attention on studies that had been conducted in similar locations and had not used electronic recording equipment. The works of Goffman, Emerson, Bloor, Dingwall, Atkinson, Delamont, Prior and Twigg (to name but a few) were influential in illustrating how ethnographic observation could be used to locate interaction in its culture of practice. In all of these eminent ethnographers' work there was certainly evidence that the observations were 'intensively focused on the visual aspects of performative action' (Atkinson et al, 2008 p. 187), but there was also an assumption that the ethnographers' work was to communicate their observations to others by capturing the utterances of the interactions while simultaneously translating their visual images of the environment and context into words.

Preparing for my fieldwork involved practising note taking while watching publically available video recordings of physiotherapy practice in hospital settings. Attempting to turn what I was observing into words proved to be problematic as I had neither the language skills nor the writing speed to accurately and richly capture the complexity of the verbal and non-verbal (spatial, physical, and movement based) elements of the interactions I was observing. Realising that word-based field notes were not, on their own, going to be a transparent and rigorous form of data to record real time physiotherapy interactions, I turned to anthropological and dance-related literature to see how researchers in other fields recorded and analysed the movement and spatial elements of human interactions.

Making visible the non-verbal elements of human interactions

The work of two American anthropologists particularly informed the development of the new method. Hall coined the term 'proxemics' to refer to the study of the use of space in communication (Hall 1966). Since Hall started using the term 'proxemics', the study of the use of space during human interactions has developed substantially. Two distinct areas in the study of proxemics are relevant here: the physical (or territorial) elements of space i.e. how interaction players are positioned in relation to each other (Hall 1966), and their individual movement flow through and use of the interaction space (Goffman 1972).

The second major influence on the creation of the new method was Birdwhistell's study of 'kinesics' or the use of gesture, movement and paralanguage (e.g. gaze) in interactions (Birdwhistell 1970). Birdwhistell suggested that not all contexts involving more than one person constitute an 'interaction' or a communicative event, rather, an interaction takes place when communicants use and respond to cross-referencing signals (Birdwhistell

1970). When an encounter becomes an interaction communication will ensue through the use of gesture, silence and 'untalk' or paralanguage, without the need for the rules of the interaction to be made plain with explicit use of verbal language.

My preliminary video studies suggested that therapists' work was often undertaken in silence and that staff appeared to be using their bodies artfully to respond to the physical needs of their patients. The therapist in Figure 2 is a classic example of a silent, focussed therapist at work. Figure 2 also shows how therapists commonly work in pairs, and together, through perhaps a sense of 'intercorporeal knowing' (Hindmarsh and Pilnick 2007, p. 1396) silently adjust their handling to achieve the physical responses they require from their patient's body.

For the rest of this paper I explore the relevance of the study of proxemics and kinesics to physiotherapy interactions, describe the development of a data collection method to record them in the field, and illustrate the use of the method in the context of hospital-based physiotherapy education.

Capturing the proxemics of interactions

A closer look at physiotherapy interactions and the development of the method

Figures 1 and 2 illustrate the close physical contact that is the norm in physiotherapy interactions. If the photographs had been taken at a time when a student was on placement with the team, the image would have included the student either watching the therapeutic interaction while set apart from it, or taking turns with the qualified therapist to perform the therapeutic activities. To capture the real time proxemics of these three-person interactions it was necessary to create a method that was able to record the broad spatial orientation of the players to each other and the presence of key artefacts or professional tools within the interaction space while simultaneously making visible the physical easefulness with which the players occupied and used the interaction space. Goffman (1972) used the term 'umwelt' to refer to a person's easefulness in space occupancy. In practice easefulness (or lack of it) was visible through the external body postures participants adopted during an interaction.

At this point it is important for readers to note that I am a physiotherapist by training. Although I have not worked clinically for over twenty years, I taught students basic therapeutic skills as an academic until 6 years ago. This insider knowledge impacted on the study because I have been trained to notice the minutiae of human movement. Physiotherapists look at movement as a series of related joint angles and associated skin and underlying muscle shapes. Throughout their training physiotherapy students spend hours watching and handling the 'normal' bodies of their peers (see for example Rose 1999). In this way students construct a mental template of normal movement against which they compare the movements they observe and feel in their patients. Thus, while my training had not prepared me for watching human movement

from a social interaction perspective, I was familiar with noticing both the limb-based specifics and the fluidity (or not) of human movement performance. As I watched the practice videos my professional vision (Goodwin 1994) appeared initially to be a hindrance to my field note writing: while I could see the contact-based, spatial and non-verbal physical changes of interaction participants, I had no way to record them. My familiarity with body shape and limb interactions during movement however became an asset as my recording method developed. The method however does not depend upon prior anatomical or physiological knowledge. All ethnographers with a keen sense of 'noticing' will be able to use the method to make visible the proxemics of an interaction. Figure 3 provides an illustration.

Figure 3: The new patient (on the left) is telling the story of his presenting condition to the therapist who makes notes on an assessment card. Both participants watch the notes.

Figure 3 is a screen shot of a video recorded new patient assessment. In Figure 3 a patient (on the left) is telling the story of his presenting condition to the therapist (on the right) who makes a written record of elements of the patient's story on the patient's record card. This interaction is typical of the early phase (known in physiotherapy as the subjective phase) of a physiotherapist's assessment of a newly referred patient. Looking at Figure 3 through a lens of 'contours of culture' (Atkinson et al. 2008) we can see some of the artefacts of physiotherapy: there are narrow padded plinths that appear to have a mechanism by which they can be raised or lowered, pillows are sparse and covered in white pillowcases, chairs are identical, upright, padded but do not look comfortable, the linoleum floor is shinning and the long windows are screened by slatted blinds. Adopting a proxemics view of the interaction we can see both participants sitting facing each other a little distance apart, and both are resting one arm on the plinth. If we take their body posture to be an outward expression of their 'umwelt' we might note that the patient has a closed upper body posture, but is seated fully and relaxed in the chair. The therapist has adopted a fully open posture and both interaction

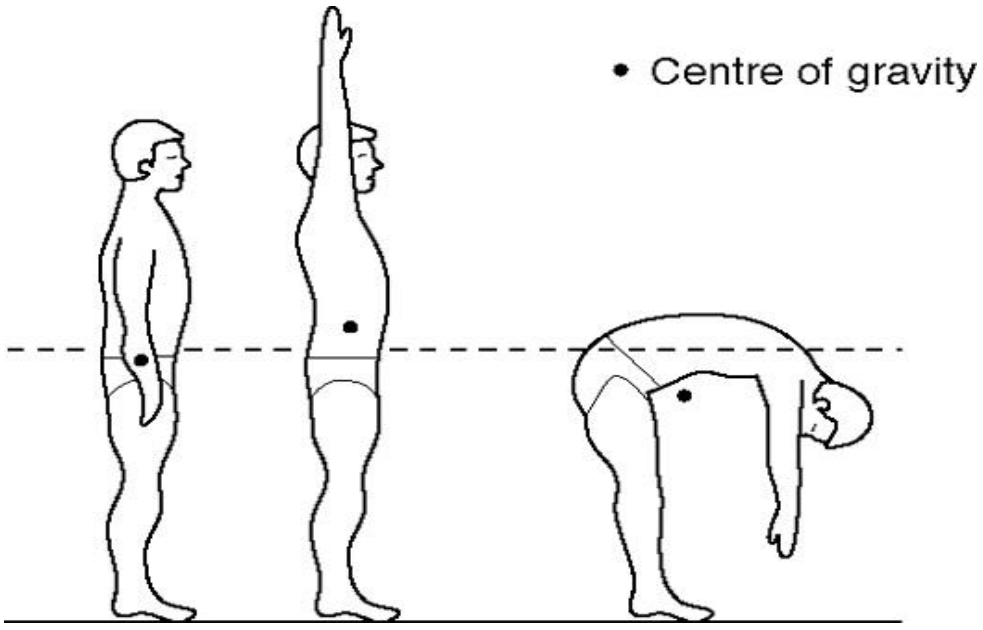
participants' eyes are focussed on a piece of paper. All this data is plainly visible, but very difficult to capture in written word form especially when the interaction is being watched in real time.

The first element of the new method therefore is to sketch the basic spatial orientation of the interaction by representing the interaction participants as line drawings. Sketching human bodies as stick figure drawings requires a basic understanding of relative human limb proportions and body stability so that, even when drawn at speed, the sketches are identifiably humans in postures that are anatomically possible, likely given the context, and reflect the proxemics as accurately as possible. While most people have a sense of relative body limb proportions from daily movement observation and childhood art lessons, compiling the limbs into a stable entity requires a basic understanding of stability as outlined below.

Creating a physically possible and stable line drawing representation of the human body

Two physical concepts are central to an understanding of the stability of a body: Centre of Gravity (COG) and Base of Support (BOS). A COG is the imaginary point in a body through which all the forces of that body are said to act. In the average standing human body the COG is said to be located internally just in front of the person's lower spine at the level of their mid-pelvis. As the relative positions of the body's limbs change the COG changes as illustrated in Figure 4.

Figure 4: The relative position of a body's COG as limbs move[1]. In the first sketch the COG lies just in front of the lower spine as the person stands at rest. The COG rises in the body as the arms are lifted above the head, and falls outside of the body (sketch 3) when the person leans over.



[1] http://content.answcdn.com/main/content/img/oxford/Oxford_Sports/0199210896.centre-of-gravity.1.jpg accessed October 11th 2011

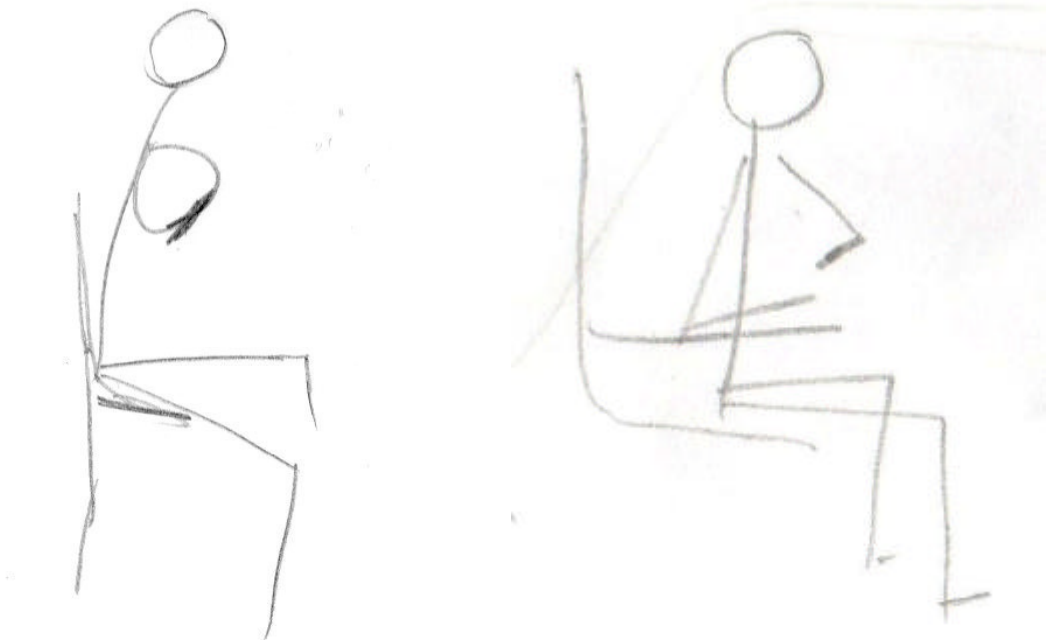
A body's Base of Support is the area bounded by the surfaces of the body in contact with a supporting surface. The height of the COG and its position within the BOS affect the body's stability and the amount of background muscle work that the body needs to recruit just to keep in that posture. Thus a person who is lying on their back will be very stable because they will have a low COG that will fall within their very large BOS; the muscles of their body will have to do very little work to maintain this position. An observer noticing muscle recruitment in lying would recognise that as unexpected. In contrast when standing the COG rises and the BOS reduces, increasing the inherent instability of the position. Standing requires the human body to recruit background muscle activity but this can be reduced by adopting anatomically efficient standing postures e.g. arms by sides with feet hip distance apart (Figure 4 Sketch 1). Adopting a forward learning posture (Figure 4 Sketch 3) is potentially stable as the COG is lowered, but, because it falls outside and in front of the body, the position requires increased muscle work in the muscles of the spine, bottom and back of the thighs to stop the body toppling forwards. This increased muscle work would again be viewed as a normal response.

Recording interaction body postures

Humans can trade the efficiency of their posture with stability by recruiting more background muscle work, but such mechanical wastefulness would be noticeable. Thus sitting on the edge of a chair is not the best use of the chair and will require more muscle work to keep the top half of the body upright. For the purposes of the method described here, I have taken body posture to be an outward sign of internal 'easefulness' within an interaction space. The line drawings in Figure 5 illustrate these ideas.

Figure 5a is a line drawing representing the patient in Figure 3 above. The patient is using the support of the chair and plinth to sit. In contrast Figure 5b captures the sitting posture of an elderly patient who has come into the physiotherapy department for the first time to have an assessment of her recently broken right wrist.

Figure 5: Using line drawings to capture ‘easefulness’ in an interaction.
Figure 5a Figure 5b



An understanding of stability helps observers to notice elements of unexpected muscle work in the patients captured in Figure 5. The patient in Figure 5a appears to be mechanically efficient because he is using the whole of the seat and plinth for support. On closer inspection however, his arm position and the muscle work required to maintain it is not efficient: even where chairs have no arm rests you might expect an arm to hang onto the thigh (as illustrated by his therapist). The potential instability of the patient in figure 5b is more obvious. Even given her short legs, the patient could easily move further back in her chair and take its support. Instead she perches on the edge and twists her upper body over her right wrist as she moves to stroke her wrist with her left hand. The sketch captures her upright spine which is an external sign of the muscle work she is doing to maintain this fairly unstable position. Exploring possible interpretations about why the patients are adopting these postures requires the proxemics sketches to be placed in the context of their accompanying ethnographic field notes and is beyond the scope of this paper. Here I use these sketches as examples of one way in which line drawings can be used to record interaction proxemics.

Capturing multi-player spatial orientation

A second use of line drawings in the context of proxemics is to record the spatial arrangement of multiple players in an interaction and, especially in physiotherapy, the external display of the therapists’ ‘intercorporeal knowledge’ (Hindmarsh and Pilnick 2007). Figure 6 is a real-time, unedited proxemics sketch of the physical assessment phase of a ward-based patient. The interaction involves three people: a therapist, a patient and a student. In this sketch the patient is sitting on the edge of their bed but neither the bed nor the mattress are drawn. The use of line drawings to record the real time

proxemics of interactions requires a significant drawing speed to capture snippets of scenes before the elements change. Drawing effective and accurate proxemics sketches thus requires the fieldworker to 'make real time judgments about the most analytically interesting features of the emerging scene' they were observing (Hindmarsh and Pilnick 2007, p. 1400). While my years of training in, and teaching of, noticing body movement gave me analytical advantage in the research setting (my 'professional vision' as it were (Goodwin 1994), these real time judgements were grounded in an understanding of the ethnographic literature about social interactions. Thus while my field notes describe that the interaction recorded in Figure 6 happened on the patient's bed in the ward, I took the decision to focus the line drawing on the physical interaction of the players.

Figure 6: Using line drawings to capture participants' spatial orientation.

The proxemics sketch in Figure 6 shows a qualified physiotherapist kneeling on the mattress behind the patient; she is supporting his back using her thighs while she holds his shoulders with her hands. The second therapist, in this instance a student, kneels on the floor and is stabilising the patient's knees with his hands. Practically this sketch was drawn from the patient's body outwards. Observing the live interaction it was clear that the patient was very weak and inherently unstable in the sitting position. As we have seen, the work of physiotherapy is to use physical resources (in this case their bodies) to help their patient's own body movement. In the placement education setting the patient becomes the vehicle through which students learn to notice variations in body movement and decide on appropriate interventions. In the ward-based setting, with the student in the role of co-worker, it is usual for the therapist to talk to the student about what she is seeing / feeling while the patient waits. It is not the place of this paper to talk about the precise nature of physiotherapy education and so the accompanying field notes and extracts of

the conversation between the therapist and student are not presented here. The knowledge that the patient was the focus of their physical and verbal attention however is why I drew the patient first so that his own efforts to support himself in sitting (his slightly forward leaning posture to lower his COG, and his outward placement of his hands on the bed to widen his BOS) were captured accurately.

Continuing the sketch outward from the patient, the line drawing records the parallel alignment of the therapist's spine with that of the patient and the student's physical contact and pressure (hands emphasised) being placed on the patient through his knees. As a whole the sketch captures the artful working of both student and therapist: the therapist's use of her own body as a support saves her having to overuse her arms for the same effect, and the student is kneeling with a wide base to ensure his own stability as he supports the patient. There was no verbal interaction between therapist and student to set up this physical orientation.

Using proxemics sketches to suggest movement fluidity with an interaction

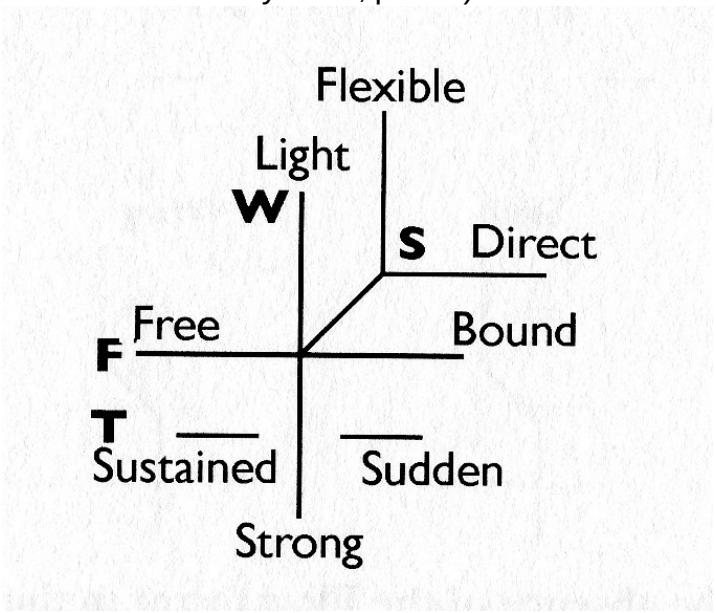
An introduction to the Laban Bartenieff Movement Analysis system

The line drawings of the new method are also used to capture a sense of movement and movement freedom within interactions. The trigger for the development of this element of the method was the Laban Bartenieff Movement Analysis system (LBMA). Experimenting with the way in which the human body could move in space, Laban a dancer and choreographer developed a two-dimensional notation system (later Labanotation) that, 'like an alphabet', spelled out patterns of movement, their place in space and their underpinning motivation (Laban and Ullman 1984). While it is possible to learn to read and reproduce labanotation, it is 'very slow and very laborious' (De Mille 1963, p. 206) and was inappropriate for a research environment where movement records were needed to be made in real time. The extension of Labanotation into the physiotherapeutic context was the work of Irmgard Bartenieff. Having studied dance with Laban, Bartenieff went on to train as a physiotherapist and, working with children suffering the physical effects of polio, created a computer-based movement analysis system that analyses both movement quantity and quality in three dimensions (Hackney 2002). LBMA describes human movement using the BESS framework outlined in Table 1 and visualises these in three dimensions as illustrated in Figure 7.

Table 1: Basic LBMA framework referred to as BESS (Campbell 2005)

LBMA framework elements			
Space	**Effort**	**Shape**	**Body**
The psychological and physical use of the body in the surrounding space.	A description of the energy invested in a movement or series of movements.	A description of the constantly changing shape of the body.	The connectivity and organisation of the whole body.

Figure 7: LBMA Effort graph. Key: W=weight, F=flow, S=space, T=time (from Newlove and Dalby 2004, p. 153).



The elements of the LBMA framework, as outlined in Table 1, require an understanding of body stability and background muscle use described earlier. Once observers can see bodies in terms of their expected stability and the associated levels of muscle recruitment, it is possible to notice how the movement between postures (as physiotherapists describe human movement) occurs with respect to the efficiency of muscle recruitment and overall movement fluidity. The fluidity with which a movement is performed is a visible feature of a person's internal health and their confidence to move within the environment. Possible causes of atypical movement range and flow include pain, muscle tightness, swelling, anxiety, fatigue etc.

Campbell and colleagues explored the application of LBMA in the context of clarinet playing (Chagnon et al. 2005). Listening to expert clarinettists and mapping their playing to their electronic LBMA profiles, Campbell noticed that different players seemed to be using their movement space differently and that this space use affected the quality of the sound they produced. From her observations Campbell called the area of an interaction space over which a person has physical or psychological control their 'kinesphere' (Campbell, 2005 p. 15). Using the grid in Figure 7 and knowledge of body stability, it is possible to describe the extent of a person's kinesphere and the quality of a movement within it. If a person only appears to move in one plane their movement is likely to be bound or restricted when they try to move from that plane into another. Bounded movement will affect functional movement fluidity as maximum movement efficiency is achieved by moving across planes. LBMA labels postures that favour movement in different planes in the terms outlined in Table 2.

Table 2: The planes used in body attitude in space (Campbell, 2005 p. 17)

Body attitude	Pin	Wall	Ball	Screw
Plane	Vertical	Vertical, horizontal	Sagittal	Vertical, horizontal, sagittal

LBMA is therefore a system by which video-based recordings of movement are analysed using computer software to produce a movement profile that enables the exploration of both the kinematic (spatial-temporal body and limb relationships: 'the what' of a movement) and the non-kinematic features (the qualitative aspects e.g. intensity, shape, flow or 'the how') of movement (Foroud and Whishaw 2006, p. 138). While LBMA itself could not be used in the field, the ideas upon which it was based, i.e. that movement and movement flow could be conceived in planar and cross-planar terms, were instrumental in the development of the new method as illustrated below.

Developing a paper and pencil method for recording body posture and use of space.

In the method of creating proxemics sketches presented here each stick figure has been drawn with emphasis on base of support and the way that the person is holding the segments of their body on top of each other. By drawing using simple lines to represent body segments and with attention to BOS and COG the data records appear realistic and come alive. In this section I illustrate how sketches can be drawn to allude to the players' movement flow within the interaction space. Some of the sketches in this section were made in the main field notes during fast moving interaction sequences and are thus on lined paper.

Figure 8 depicts the standing postures of two students Isobel and Stuart (names are pseudonyms). All sketches were taken when the students were observing their educator talk to a patient in a hospital ward-based setting. In each case the student was about to be asked to do something with the patient. Using LBMA terminology Isobel (Figure 8a) stands with a wide base of support in a horizontal plane. While she plays with the button of her shirt, she stands tall, almost planted over her BOS. Using Campbell's LBMA descriptors Isobel would be described as in a 'wall' body attitude. In Figure 8b Stuart is drawn first planted in a horizontal plane and then in a posture using all planes of movement as he rests on a patient's ward cupboard. Stuart (referring to Table 2) would be described as adopting a 'screw' body attitude.

The reason for focussing on body attitude here is because observations of these students in non-educator-present time suggested that they moved freely across movement planes and performed everyday functional activities in ways that appeared normal. In the clinical setting however, under the supervision of her educator Isobel's posture changed and her movement became bound. As a physiotherapist uses her own body to facilitate the movement of others, it is crucial that their movement is as 'normal' as possible so that the patient's

body learns appropriately. Figure 9 develops the proxemics sketches of these students to capture the impact of body attitude on therapeutic interactions with patients.

Figure 8: Body postures adopted by students when in a ward setting. Figure 8a shows Isobel planted in a 'wall' attitude and Figures 8b Stuart adopting cross planar postures.

Figure 8a: Isobel 8b: Stuart in two poses

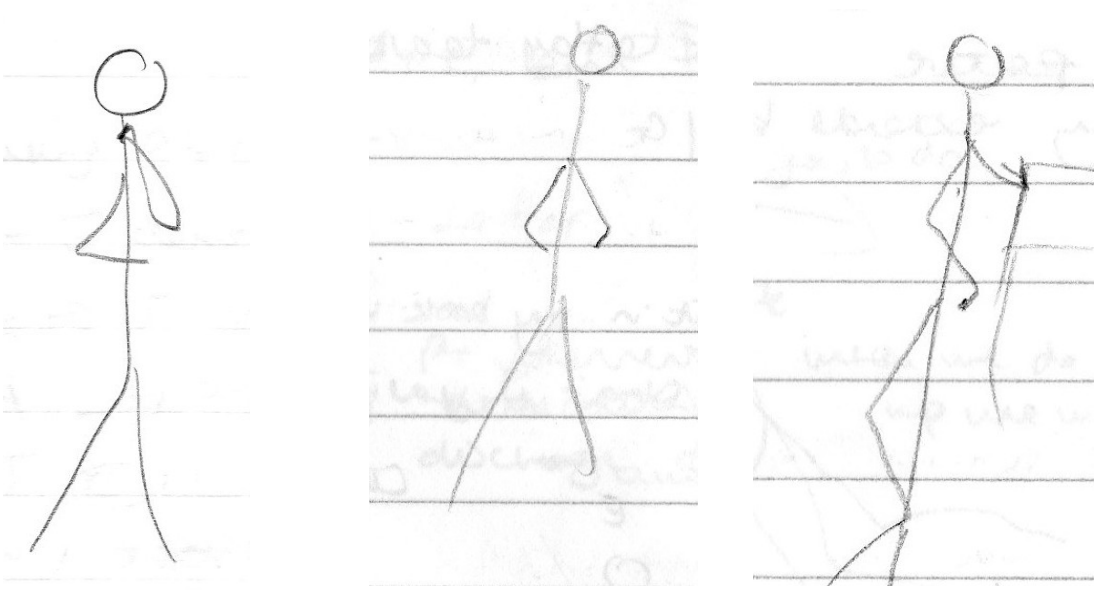


Figure 9: The implications of body attitude on therapeutic interactions.
Figure 9a: Isobel (in 'wall' body attitude on the patient's left) crab walks alongside a patient. Maintaining normal stride rhythm was difficult and Isobel had to frequently perform a quick skip to prevent herself tripping over her feet.

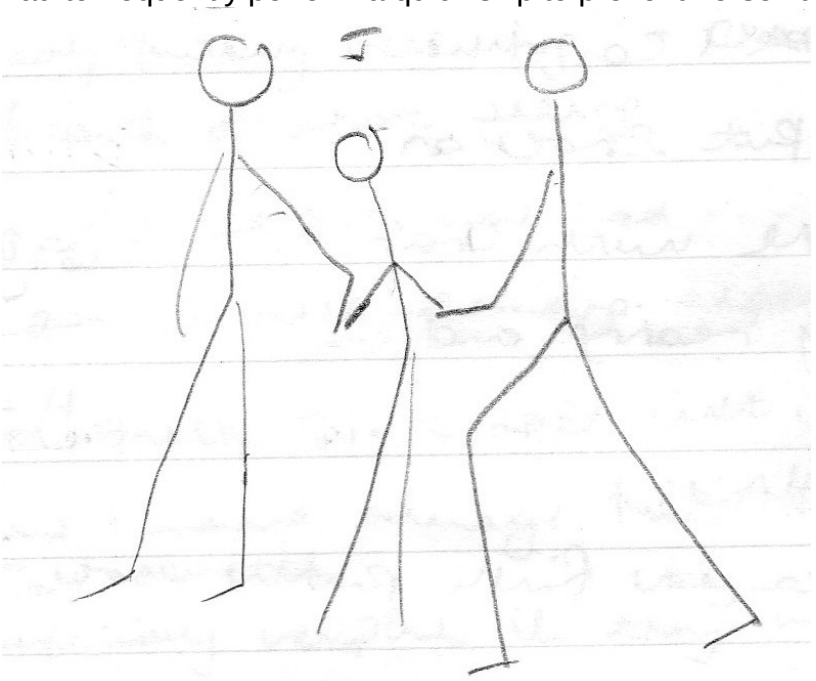
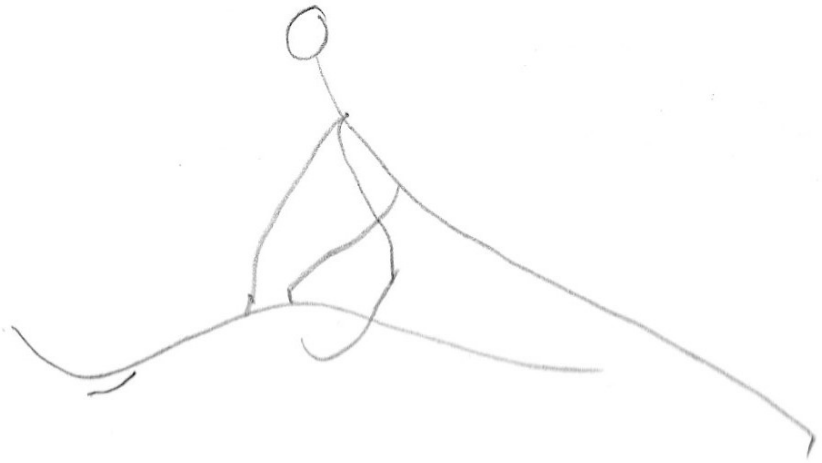


Figure 9b: Stuart facilitating a patient's cross-planar movement from lying to sitting by controlling the movement of the patient's legs.



In Figure 9a, Isobel is drawn walking crab-style (i.e. retaining her 'wall' body attitude) while her educator walks freely on the far side of the patient. Stuart's cross-planar, more 'normal' movements (Figure 9b) were ironically much more difficult to capture in a two-dimensional proxemics sketch than his peer's more uni-planar activities. In Figure 9b Stuart is helping to move a patient's legs from lying to sitting. To do this smoothly, so that the patient feels the movement as normally as if he does it himself, Stuart needs to lower his COG and embrace the patient's legs. In this way the patient's limbs become part of Stuart's own movement of weight transference from his back to his front right leg. By keeping his own BOS large and close to the patient Stuart ensures both his own stability and that the patient experiences a fluid movement into sitting. The proxemics sketch in Figure 9b tries to capture the smoothness of Stuart's movement by focussing on his BOS, COG and contact with the patient.

Stuart's cross-planar movement freedom and fluidity was unusual. Most of the students I observed adopted 'pin' or 'wall' body attitudes in clinical settings. The reasons for their restricted kinesphere and movement flow are not explored here, but their proxemics sketches are used to illustrate how simple line draws can make movement freedom visible. Figure 10 records a student and her educator performing the same activity during a skills-practice session. In Figure 10 the pair are practising a skill that requires the transmission of force through the therapists' hands to stabilise a patient's pelvis (here the pelvis of a fellow therapist). The 'weak patient' is expected to use the stability they are given to perform 'normal' quality leg movements. The skill of the therapist is to match the support offered with the support needed by providing body force in a way that is efficient and effective i.e. that enables the therapist to protect her own body. The proxemics sketches in Figure 10 record the impact of different therapist body attitudes and movement flow on patient movement outcomes.

Figure 10: Drawing proxemics sketches to suggest effort and movement flow.

Figure 10a: A student performs a technique on a model who is lying on a raised plinth. The movement is bound. The model feels the awkwardness in her body and offers guidance.

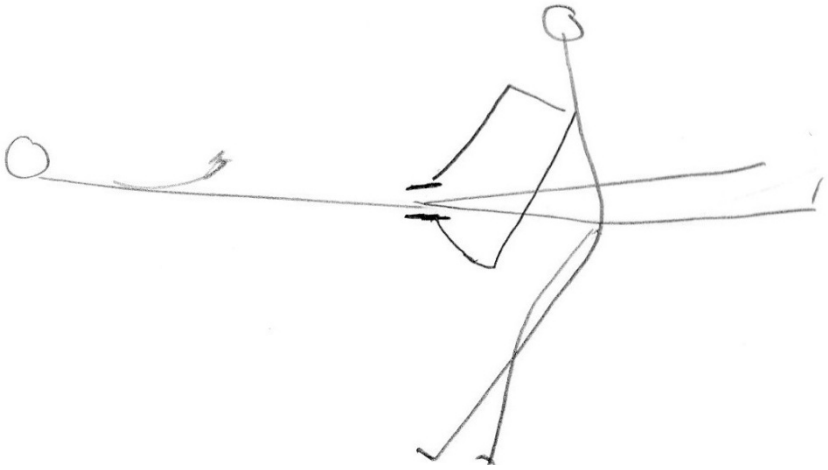


Figure 10b: The technique performed by a skilled therapist. The movement is focussed, free and results in a smooth leg raise.

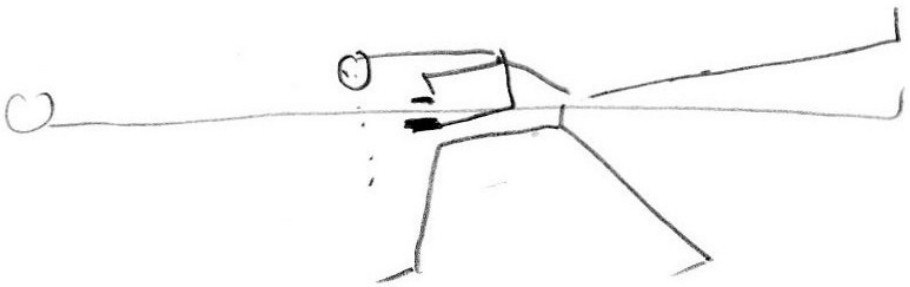


Figure 10a is a proxemics sketch of a student who adopts a ‘pin’ body attitude (i.e. she tries to stay within the vertical plane [Table 2]) while in the clinical context, trying to perform the pelvis support activity. The sketch has been drawn starting with the physical points of contact between the pair and outward to her base of support. In the sketch the student’s small BOS and straight knees prevent her lowering her COG so that she can approach the patient’s pelvis. She needs to apply bilateral horizontal forces through her arms (in a pincher-type movement) and must come out of the vertical plane to do this. The proxemics sketch captures her reluctance to move across planes and the bound, restricted movement that ensues. Bending her arms over a small BOS sends her own pelvis backwards and makes her unstable. She compensates for the instability by increasing the surface area of her hand holds on the ‘patient’s’ pelvis. The model is aware that she is not feeling the support as she should and is raising her head and talking (and gesticulating) to the student as the movement is performed. As a consequence of her own

upper body movement, the model's leg rises and gives the impression that the student's technique is effective. The educator is unable to see the posture of the student and does not question it. The proxemics sketch in Figure 10b illustrates the same technique performed by a skilled therapist. The difference in body attitude is striking and the 'patient' responds to the smooth, focussed support she receives with a relaxed leg movement.

Section summary:

In this section I have presented a method of capturing visually in real time, and with only paper and pencil, the physical and spatial elements of interactions. Drawing on the work of Goffman and LBMA the method for creates proxemics sketches that are capable of recording:

- The spatial orientation of the interaction players and their key artefacts;
- The 'Umwelt' or 'easefulness' of the individuals in the interaction and
- Physical movement flow within the interaction space particularly where the movement has occurred in one plane.

The use of the method has been illustrated in physiotherapy contexts. My insider knowledge has been an asset in helping me notice movement-related elements of physiotherapy interactions, but the steps to creating these proxemics sketches is accessible to all. In the next section I develop the proxemics sketches to record the use of gaze in the interaction and introduce the final element of the method: the kinesics stave.

Two ways to record elements of the kinesics of an interaction

As illustrated in Figures 1, 2, 3 and 5b physiotherapy interactions include periods when therapists watch faces and body parts, and patients watch the treatment notes and touch their own bodies. These nonverbal activities were consistent elements of the video recordings I used to prepare for my fieldwork. Specifically focussing on the therapists' use of their eye movements suggested that physiotherapists use gaze in two different, but consistent, ways in patient-facing interactions. In this section I present the final two elements of my new paper and pencil method which focus on recording the kinesics or the gaze and paralanguage of an interaction (Birdwhistell 1970).

Birdwhistell worked, using videos of human interactions in a variety of contexts, to develop a detailed annotation system for different elements of face, eye and head movement. His aim was to explore the idea that learned forms of communication were 'patterned within a culture' and were distinct to that culture (Birdwhistell, 1970 p. xi). The minute detail of Birdwhistell's annotation system was inappropriate for real time fieldwork, but his focus on individual and shared eye movements or gaze as tools for managing a therapeutic interaction and signalling the focus of a therapist's attention have been invaluable in the development of the data collection method here.

Tracking the focus of players' gaze during therapeutic interactions

I use the term 'gaze' to describe prolonged eye focus that is distinct from the quick flashes to faces, body parts and artefacts that were captured during the more verbal-based phases of physiotherapy interactions (see later sections). Recording gaze is simply a matter of drawing hashed or continuous lines onto proxemics sketches to illustrate the gaze direction. This simple method has enabled a number of different uses of gaze to be identified in physiotherapy interactions. We have seen earlier, in Figure 2, how gaze is used as a blank stare as therapists concentrate on what they are feeling through their hand. In addition we saw in Figure 3 how patients sit quietly watching their upside down notes being written during the assessment phase of interactions. Figure 11 is the full, real time drawn sketch of the interaction in Figure 3 to capture both the proxemics and the gaze lines of the interaction participants.

Figure 11:

Figure 12 illustrates three other uses of gaze within interactions that became visible once gaze lines were added to the proxemics sketches.

Figure 12: Making the work of physiotherapy visible through the addition of gaze lines
Figure 12a: Capturing a patient's 'middle distance gaze' and the therapists' focus on the patient's face.

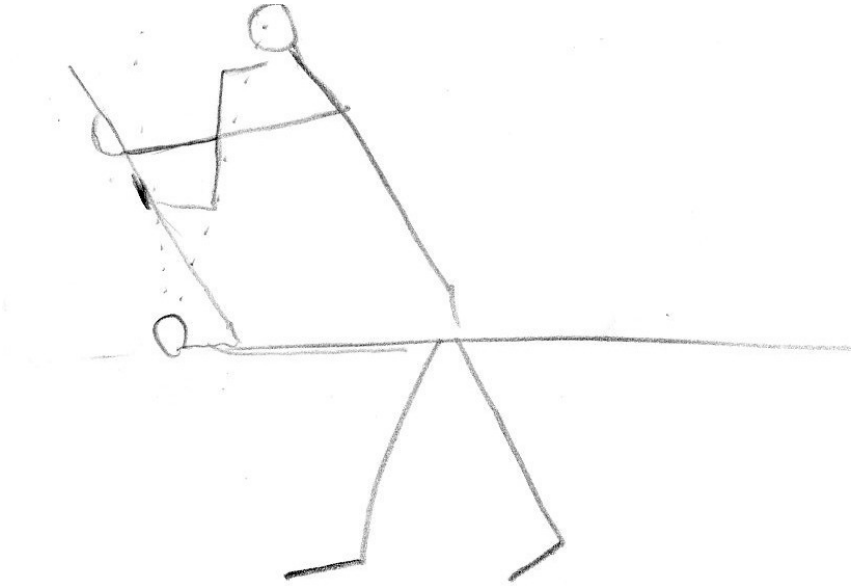


Figure 12b: Using gaze lines to identify the focus of a physiotherapist's work.

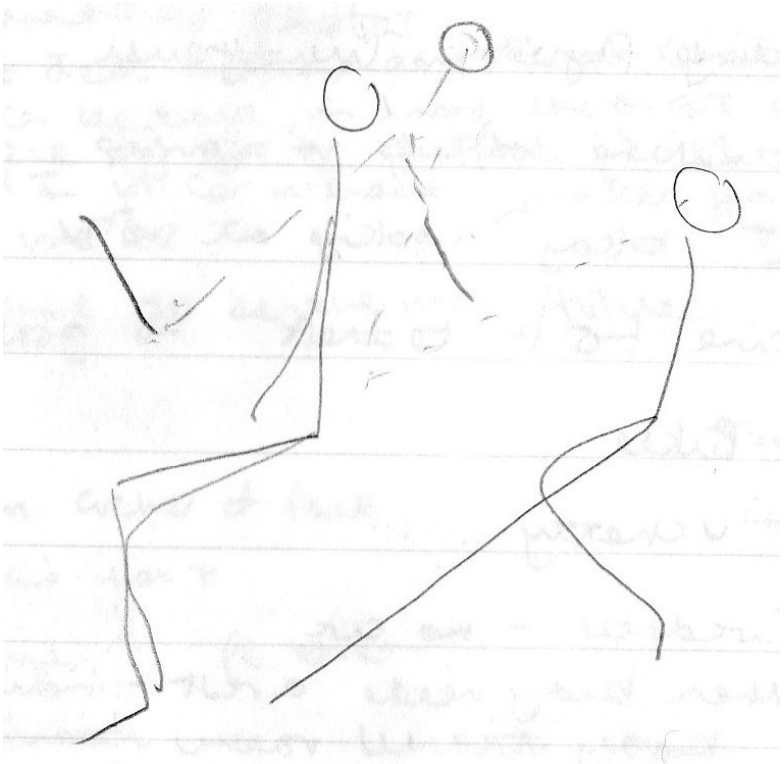
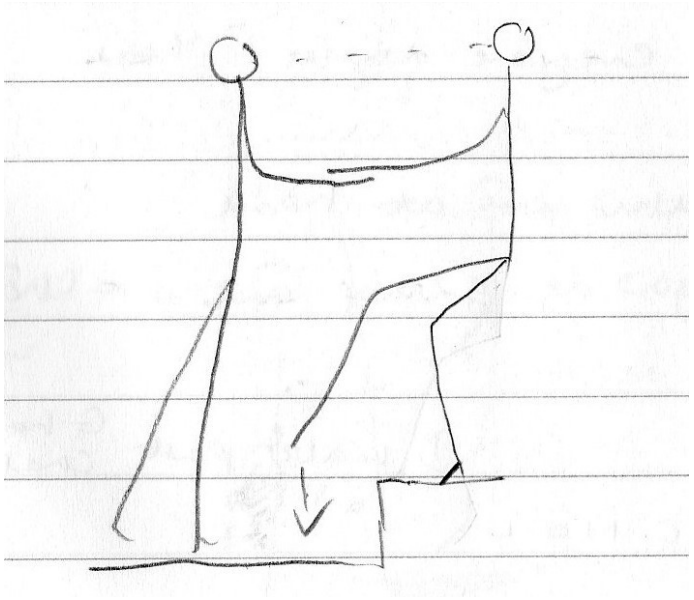


Figure 12c: The kinesics of the hydrotherapy pool: holding eye contact and ignoring ‘the part’.



In Figure 12a a student is moving a patient’s shoulder. The patient is lying, undressed to the waist, on the plinth. The therapist has told the patient to relax so that he can move their arm without the potential obstruction of the patient’s muscle work. The hashed lines represent the lines of gaze for each player in the interaction. The sketch captures the patient’s focus on the ceiling of the treatment cubicle. This focussing of gaze away from the eye contact of the therapist (even when that therapist is almost in the direct line of the gaze) mirrors Heath’s observation that, during the physical phase of a medical assessment, patients attempt to distance themselves from the body work being performed on them (Heath 1986). Another feature of the sketch in Figure 12a is the focus of the student’s gaze on the patient’s face. This scene was replicated in almost every physical assessment interaction observed during the fieldwork. Therapists describe this gaze as searching the patient’s face for signs of pain or discomfort (twitching eyes, mouth movements etc.) as they performed movements on the patient’s body.

The proxemics sketch in Figure 12b records a new patient assessment in which the student and their educator are both playing an active role. Before conducting a physical examination of the patient, the pair undertakes a detailed observation of the patient. In this sketch the patient, a female in her mid-twenties, is sitting on the edge of a wide plinth wearing sports bra and shorts. The therapists conduct their observation by climbing around her on the plinth. The proxemics sketch with gaze lines added (Figure 12b) illustrates that the patient’s lower back is the object of the therapists’ attention during this phase of the assessment.

Finally in Figure 12c gaze lines capture the fact that interactions in the hydrotherapy pool (a pool of warm water in which patients exercise) are different from physiotherapy interactions on dry land. The hydrotherapy pool was the only environment in which gaze focussed almost entirely on mutual

eye contact. In Figure 12c the student (on the left) is seen offering his hands for support as the patient, who has a painful hip, goes to make a step down in the water. On dry land the physiotherapist would watch the patient's limb as the movement was being performed. In the pool the therapist appears to ignore the 'part' and focuses instead on the patient's eyes. This gaze holding was a consistent feature of all physiotherapy interactions observed in the pool environment and appears to be a device for both players to manage the potential awkwardness of exercising in close proximity with almost strangers while everyone is wearing only swimwear.

Adapting Heath's kinesics staves to record the paralanguage of physiotherapy assessments.

The final element of the method is the creation of a kinesics stave to track the moment-by-moment use of eye contact during periods where people are physically static but engaged in verbal interaction. As we have seen earlier, new patient physiotherapy assessments in non-ward contexts begin with a period of verbal information gathering. In this 'subjective' phase of an assessment the therapist asks the patient a series of standard, and then more focussed, questions to elicit the history and scale of the patient's presenting condition. The therapist will use the information gathered during this phase to formulate possible hypotheses which will focus the objective (or physical) phase of the assessment process. Preliminary observations of subjective assessment interactions suggested that the therapists were using an eye-contact-based system to manage their patient's responses.

The form of kinesics stave developed here draws heavily on the ideas of Heath (1986). Heath built on Birdwhistell's work in his 1986 study of interactions between doctors (GPs) and patients. Specialising in video-based studies of social interaction and with a particular interest in the interplay of talk and bodily conduct, Heath developed an annotation system that combined eye movement descriptors with transcripts of the verbal elements of interactions (see Figure 13a). Developed retrospectively from video recordings of doctor: patient interactions, Heath's notation system aligns the verbal and non-verbal, eye-based movements of the interaction players above each other in the form of a stave. Heath's intention was to develop a system that illustrated how the 'vocal and visual elements' of interactions are 'packaged together to accomplish a particular activity' (Heath 1986, p. 17).

Figure 13a: Heath's Transcription System for the visual elements of an interaction (Heath, 1986 p xii - xiii).

_____	Gazing at the face of the co-participant
- - - - - - - - -	Looking at an object
""""""""""""""""""""""""""""""	Turning away from a participant
.....	Turning towards a co-participant
----------	Movement (with the type of movement hand written)

Figure 13b: An example of Heath's annotation system recording the eye-based paralanguage of a doctor: patient interaction (Heath, 1986 p. 32).

Dr looks at desk
- ..----------
Dr: ----------, ---------°hhhhh right-well....
P: tch
....__________

In Figure 13b Heath's stave places the players' kinesics actions on top of each other so that it is possible to read how they interact with each other over time. The stave is read from left to right. In his system Heath writes the gross movements of the players (here the Doctor) into the stave by hand (type) and uses variations of hashed lines to reflect eye movement. While it was impossible to implement this notation system in real time observation, the idea of recording the non-verbal interaction between players in the form of a stave that moved with time across the page from left to right, provided a significant step in the development of my hand drawn kinesics stave.

Creating a two-person kinesics stave

The aim of the method of drawing kinesics staves presented here is thus to capture the location of the individuals' eye focus and paralanguage (e.g. gesturing) throughout the interaction sequence. A hand written, real time kinesics stave is created by drawing a horizontal line across a page and placing one interaction player above, and the other below, the line. The stave is written as paired sequences from left to right as the interaction progresses i.e. as the person on the top of the stave does 'x' the person under the line does 'y'. Where possible snippets of verbal interaction are recorded to place the kinesics in context, but the emphasis is on tracking gesture and eye movements.

Figure 14 presents the full data set collected during the assessment of the patient introduced in Figure 5b. The interaction is between an elderly patient and a student, Emily (her pseudonym). The sequence commences with the written field notes. As the interaction players settled physically I recorded the proxemics and immediately began creating a stave to capture the kinesics of the subjective assessment as it unfolded. The stave in Figure 14a is the handwritten record collected in real time. The typed version of the stave follows underneath (Figure 14b).

Reading the stave in Figure 14b from left to right, Emily is recorded looking at the patient's face as she asks her first question. The patient responds verbally and with eye contact. As the patient talks about her wrist problem, she moves her wrist. As the patient continues to speak (noted by the continuous line), Emily begins writing her notes while making the occasional flash of eye movement to the patient's face. The next sequences of the stave capture the patient trying to offer Emily unsolicited information. Initially Emily meets the patient's eyes, but as the patient's talk continues Emily removes eye contact and focuses solely on the notes she is writing. The patient is recorded actively searching for Emily's eyes. Not receiving any reciprocal eye contact the patient stops talking. Emily's next question is asked while still looking at her notes. The patient replies and stops. Emily gives the patient quick eye contact before returning to the notes. The rest of the kinesics stave captures an interaction where the therapist asks a question, flashes her eyes to the patient, the patient responds while watching the upside down notes being written, and remains silent until asked another question. I suggest that the kinesics stave in Figure 14b captures Emily turning an encounter with a new patient into a therapeutic interaction (Birdwhistell, 1970) by using 'the look' (Heath, 1986 p. 26) to initiate and progress the interaction. Over the course of this two minute extract I think we can see the patient's behaviour change as she learns the 'participation framework' of a physiotherapy interaction (Heath, 1986 p. 98).

The interaction pattern captured in Figure 14 was repeated in every two-way interview observed for this study irrespective of the proxemics of the setting (see for example Figures 11 and 14a). Further, in each case the patient appeared to learn the interaction pattern and adopt the role of a 'competent patient' (Heath 2006, p. 186). While not included in this paper, the kinesics staves were used successfully in three-way interactions (i.e. where the student's clinician was in the interaction) by drawing a second horizontal line onto the page. Interestingly, the addition of a second therapist (or student) appeared to disrupt the kinesics-based control of the interaction, with patients asking questions and initiating conversation.

Writing kinesics staves in real time is not difficult and offers a new opportunity to record the minutiae of eye-based interactions reliably and rigorously.

Figure 14 Turning an encounter into a physiotherapy interaction: the subjective assessment of a new patient
Figure 14a: The full proxemics sketch, field notes and handwritten kinesics stave as they were recorded in real time

10.43am Emily gone to collect patient. Comes back with patient and settles in chair.
10.47 Emily manoeuvres bed backwards – back rest still up;
Patient: 'Shall I take off my coat?'
Emily sitting on bed perched on high plinth: 'No, I just want to ask you a few questions first. We have had a referral … how did you do it?'

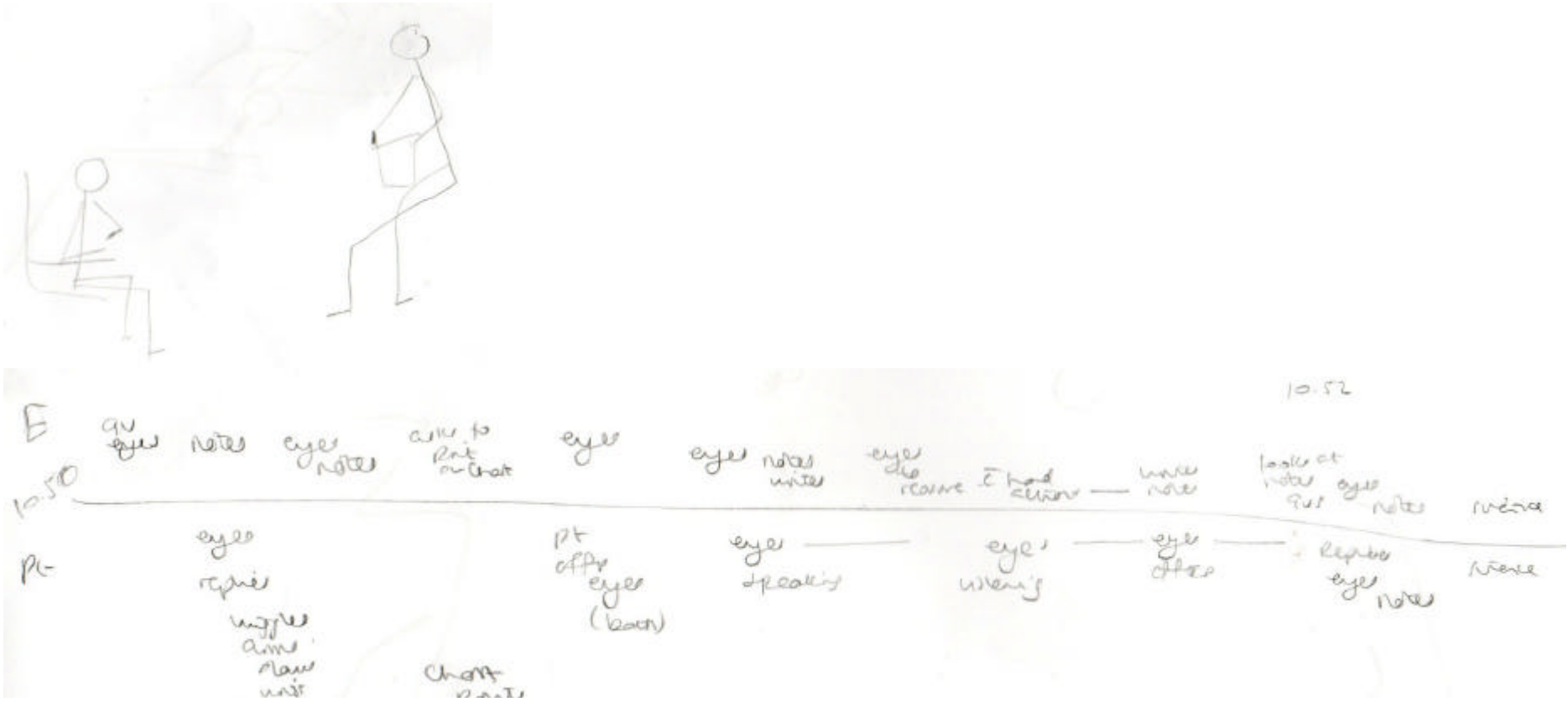
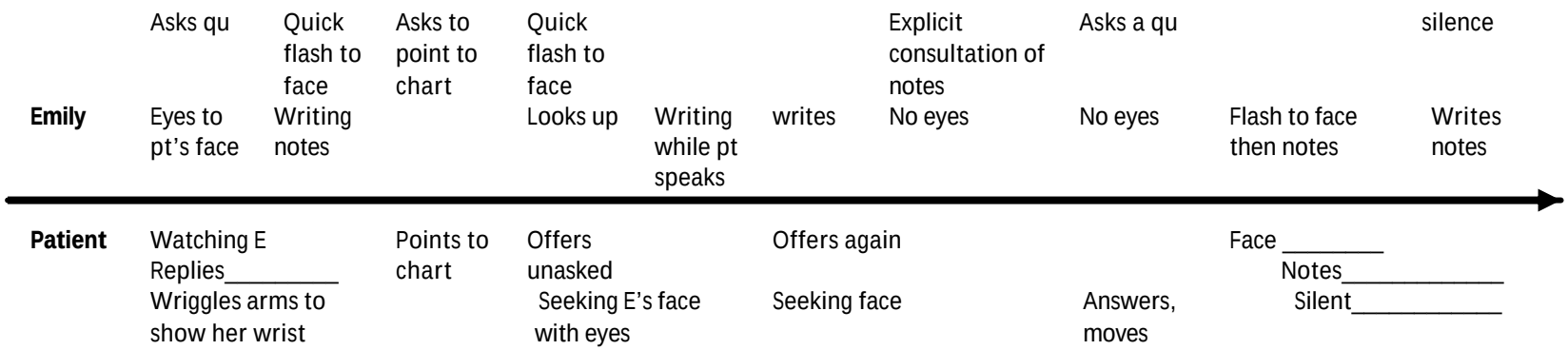


Figure 14b: A word processed kinescics stave



Section summary

This section has introduced two pencil and paper based tools for recording the use of kinesics or non-verbal paralanguage within interactions. The new data collection tools build on the work of Birdwhistell and Heath to record prolonged episodes of eye focus (gaze) and other quicker, more flash-like eye movements and communicative gestures.

The first tool is to draw gaze lines onto existing proxemics sketches to make visible the focus of players' attention during an interaction. Analysis of the completed sketches in the current study suggested that gaze was consistently, but differently, used by both patients and therapists.

The second tool is a version of Heath's kinesics stave that can be drawn in real time and used to record the eye-contact and gesture based elements of interactions. Kinesics staves are compiled where the interaction participants are static physically. Analyses of two-way staves recorded during patient: therapist interactions suggest that therapists use the giving and removing of eye contact to control patient involvement in therapeutic interactions.

The final sections of this paper summarise and systematise the full data collection method and make recommendations for further development.

Systematising the method

This paper has introduced a method for collecting elements of the proxemics and kinesics of real time interactions using only paper and pencil. The method comprises two new tools that supplement written field notes: proxemics sketches or line drawings, and kinesics staves. In this section I summarise the key steps to compile each data collection tool and discuss possible adjustments and applications for their use.

Proxemics sketches

In this method line drawings are used to record the following elements of the proxemics of an interaction:

i) the spatial orientation of the interaction players (after Hall, 1966);
ii) the key artefacts of the environment;
iii) the players' interaction with the artefacts and each other (after Goffman, 1972);
iv) a sense of an individual's 'umwelt' within the interaction setting (after Goffman, 1972);
v) and an individual's movement freedom within and through the interaction space (after LBMA and Campbell, 2005).

The proxemics sketch is also the vehicle used for recording the focus of sustained participant gaze during an interaction (after Birdwhistell, 1970).

Representing the human body with line drawings (thus as stick figures) requires a basic understanding both of the relative proportion of the limbs of the body, and their interdependence with respect to maintaining the body's balance and freedom of

movement. Figure 15 outlines a basic protocol for creating proxemics sketches that I developed following extensive drawing practice using videotaped recordings of physiotherapy interactions. I used the protocol in the field, stuck to my clipboard, when I felt at a loss about how to capture the complexity of the interactions I was observing.

Figure 15: Protocol for creating stick figure line drawings of human interactions

- If possible position yourself sideways to the interaction;
- Draw the humans before the furniture or artefacts in the space;
- If participants are in physical contact start by drawing their contact points. Emphasise contact point size;
- Draw backwards from the contact points to the participants' base of support (e.g. floor, chair seat etc.) particularly ensuring that spinal and limb alignment indicates the relative stability or instability with which the movement appears to be progressing;
- Draw in key artefacts and furniture;
- Draw in gaze lines.

On a practical note, the challenges of speed sketching in the field cannot be underestimated. In the context of fast moving hospital-based observations it was essential that I was self-sufficient and as inconspicuous as possible. I spent many hours testing drawing pencils and practising sketching while standing so that I could learn to balance my clip board, field note book, patient consent forms etc. with enough space to sketch freely. Thus in my study I used 0.5mm leaded propelling pencils of high quality that ran smoothly (quickly and silently) across the paper and had an inbuilt and effective eraser. These may sound small issues but were essential to enable me to draw freely and with confidence in the field.

All the proxemics sketches used in this paper are originals and have not been redrawn or enhanced. In the context of today's video graphic packages it may be possible to develop a tool for deepening the lines of the drawings and highlighting different features or artefacts with colour. I think the proxemics sketches have huge potential for the study of human interactions. In my own work as a teacher for example, I spend many hours observing other teachers teach. The proxemics sketching ideas developed here are offering me a new way of capturing the impact of the teaching environment (and teacher) on students for teacher self-critique and reflection. I also anticipate the use of the method within pre-registration physiotherapy curricula. Teaching students to sketch would help them to see how body attitude impacts on movement flow and thus the execution and effectiveness of their therapeutic techniques. Making visible the possible differences between students' 'at ease' and 'placement-based' body attitudes could help students reflect on the reasons for their change in posture in clinical settings, and consider strategies to ameliorate the impact of these changes. Helping students visualise their posture and movement flow could also reduce the wear and tear of physiotherapy practice on their bodies and improve their patients' experience of physiotherapeutic handling.

The experience of collecting and subsequently using the proxemics sketches suggests that there is real potential for the method to enrich word-based field notes during ethnographic observations. I am aware however that the success of the tool in

the physiotherapy education study is probably due to the fact that anxious people (be they students or patients) appear to be bound or restricted within one plane of movement. The next challenge for the development of the method would be its use to record free flowing, cross-planar and thus 'normal' 3D movements.

b) Kinesics staves

The second element of the new method is to draw a kinesics stave. An empty stave is prepared by drawing a line across a page with one participant named above and one below the line. The stave is filled from left to right by recording the related elements of participants' paralanguage as adjacent elements on the stave.

Within the context of hospital-based physiotherapy education, the kinesics stave was only used when the interaction participants were engaged in verbal interaction. Attempts to create kinesics staves during periods of physical contact between participants were abandoned because touch immediately dominated the interaction. At the moment of physical contact the players' eye-based interactions changed from the quick flashes of eye contact seen in Figure 14 to the body-part or unfocused gaze kinesics of Figures 2 and 12. Proxemics sketches with gaze lines were the tool of choice in these settings.

Conclusions

This paper has introduced a new method for recording movement and touch based elements of interactions in real time without the use of electronic recording equipment. Two paper and pencil tools (proxemics sketches and kinesics staves) form the basis of the method. The development of the method is grounded in a critique of the related ethnographic and anthropological literature and a basic understanding of human movement. While my professional vision (Goodwin, 1994) was important for the creation of the method, this paper has made it an accessible resource for all field researchers with a keen sense of noticing.

As a fully portable tool, the method reduces the impact on observed interactions that video equipment might induce, and avoids the significant problem of returning from the field to find that video recordings have not focussed on core details of the interactions (see for example Jordan and Henderson 1995). In addition, the method enables real time ethnographic field note data to make visible elements of interactions that are not easily translated into words. This paper has illustrated how, when used individually and, most powerfully in combination, the elements of the method can make visible the complexity of naturally occurring interactions. In the context of hospital-based physiotherapy education, detailed analysis of the multi-layered data collected using the method has enabled practices of this touch and movement-based profession to be described in new ways.

Drawing proxemics sketches and creating kinesics staves does however require practice to ensure the accuracy and usefulness of the data collected. Specifically the method requires significant drawing speeds, first-time accuracy and the confidence to make minute-by-minute decisions about what data to capture (Hindmarsh and Pilnick, 2007) using which tool. The implications of this decision-making are clear in the data presented in this paper. Unlike the photographs, the stick figure sketches

offer little sense of the ‘contours of (the) culture’ I was observing (Atkinson et al, 2008). In my data set however, I have sketches of frequently used spaces that were drawn during periods of non-observation. These background sketches place the observation data in its wider context and avoided cluttering the real time proxemics sketches.

Notwithstanding the challenges of decision-making and drawing accuracy, I think the method is a considerable addition to the ethnographer’s toolkit. I look forward to working with others to test out the method in new settings and develop the proxemics sketches to record cross-planar movement more effectively.

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