The Significant Walks Project

Aesthetic Articulations of Walking, Data, and Place

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Abstract This paper discusses how the *Significant Walks* (2014) research project explored the impact of walking with chronic low back pain (CLBP).[1] The project involved an interdisciplinary research team working with participants to document how the familiarity of personal walks might be understood as a measure of physical and mental experience. The research methodology combined point of view video documentation of each walk, with simultaneously gathered biomechanical data recording the movement of the spine. Verbal data on pain levels experienced whilst walking was also collected. Additional layers of visualisation were added to the synthesized footage as the team worked with participants to explore how the interpretive aesthetics of visual effects applied to each walker's documentary film of their walk could further express their experience of walking with CLBP. Driven by the biomechanical data, the intensity of these effects captured interoceptive visual narratives that explored place, movement and sensory perception.

Focussing on the importance of real-world experience, the project took research out of the laboratory and clinic to investigate how personal walks might act as a measure of the changing physical experiences associated with chronic low back pain. By engaging directly with each participant's environment, these encounters revealed how individualised documentation can simultaneously express quantitative and qualitative responses to physical experiences. The research methodology reinstated each participant's aesthetic interpretation at the core of understanding and engaged with the arts and health agenda, phenomenology and aspects of new materialism. The resulting films act as a communicative interface, conveying the impact and lived experience of the prevalent, but often overlooked, condition of CLBP and exploring the connectivity of human, site, materials, technology and environment.

Keywords Arts & Health, Visual Art, Physiotherapy, Phenomenology, New Materialism

Introduction: From Drawn to Digital Realities

The rise in creative responses to illness has evolved as a defined area of practice that brings health professionals and patient groups together to create viable shared understandings of health conditions. The efficacy of creativity is increasingly recognised as a viable way to develop shared understanding communicated as visual or other outputs. In 1917 during World War 1, surgeon and artist Henry Tonks' drawn documentation of soldier's facial trauma began to address issues of disfigurement and identity. Initially producing drawings of pre and post-surgical procedures as a documentary aid, Tonks work raised "uncomfortable questions about the nature of subjectivity and the ethics of viewing" (Chambers 2009: 579), where his use of fragile pastels as a drawing medium adds personality, delicacy and a sense of empathy to the documentary process (*ibid.* 587). Tonks' additional insight as a trained surgeon provided the objective quantitative assessment of surgical training alongside the subjective qualitative eye of the artist, setting a model for future investigative work that has increasingly brought artists, medics and health professionals together in analysing the impact of health conditions. In recent years art has been recognised as an important means to extrapolate the experiential identity of patients as significant to the lived experience of health conditions, and therefore as a catalytic point of reference that, when enabled through cre-

ative processes, can begin to create an interface between patients and clinicians. Key to this process is engendering in patients and participants a sense of confidence that their voice is valued and that the process of communicating through art, when effectively managed, can contribute real understanding and therefore more constructive pain or life management processes for both clinicians and patient participants.

The transferability of visual practice that informs medical and public understanding has become a keystone of funding within the burgeoning arts and health environment, with significant investment by funders recognising the value of creativity as essential to public engagement with health and other sciences. The range of outputs has been wide and varied, from autobiographical approaches by artists such as Jo Spence (2020) to collaborative projects where artists such as Deborah Padfield explore the value of visual images in the diagnosis and management of chronic pain (*ibid.* 2020b; Macek: no date). The arts and health agenda has generated a range of participatory projects that include active collaboration with children and older adulthood groups in a variety of contexts. These have included, amongst others, initiatives involving dance, music and walking projects, confirming that arts engagement can contribute to wellbeing and improved mental health in a variety of clinical, applied health and community contexts (APPG 2017). These initiatives have shed light on the benefits of experiential sharing and have variously generated site or participant specific insight into a range of physical and mental health conditions.

The role of technology has been varied across these initiatives but has predominantly been employed as a documentary tool to record events and capture live or performative interventions on site. The transferability of digital forms of documentation has enabled the wide dissemination of outcomes alongside still imagery of research methods and the resulting creative outputs. However, there is less evidence of technologies being used as formative elements of research and although in some work the use of clinical data underpinned creative responses, the direct incorporation of data as visual form has been less well investigated. Within *Significant Walks* the innovative use of synchronised data was the fundamental underpinning of the research, with digital visual documentation providing a vehicle for the expression of biomechanical data. The two processes of collecting video documentation and movement data simultaneously whilst walking, were co-dependent and provided bespoke visual records of each participant's walk.

The Context of Aesthetics Within Contemporary Arts and Health Research

Practice-based research within the creative disciplines has evolved and widened in recent years,[2] and interdisciplinary approaches to research have recognised the value of arts practice as an interface that creates co-related understanding between research fields, via creative outputs that effectively interpret the sciences to their varied publics. In addition, the burgeoning growth of arts and health agendas recognises creative interchange as an effective conduit for shared understanding between medics, allied health practitioners, patients and service users (APPG 2017). Inter- and co-disciplinary research teams now affirm the communicative value of embodied approaches to knowledge that can reveal the co-dependent dynamic of symptoms that individuals experience within particular cultural, social and familial environments (Murray 2015; Carel 2016a; Padfield *et al.* 2018, 2020a). Mixed methods and qualitative approaches to research have widened to affirm creative processes and the production of arts outputs as viable research, where outcomes prioritise the experience of the patient or participant as the formative producer, rather than the recipient, of knowledge. In some cases the process of generating knowledge through active, participative actions replaces the product as the locus of enquiry (Johnson 2010), with the hapticity of making (Pallasmaa 2009; Biggs *et al.* 2010; Ingold 2010; McNiff 2013), or the embodied nature of movement (Sheets-Johnstone 2011), seen as viable transferable knowledge systems. The resulting blend of knowledge informs researchers, patients and participants, with the former providing a framework of enquiry and the latter an expression of lived, contextual experience that can avoid the "abstractive and generalising" objectivity of science (Johnson 2010: 147).

Aesthetics, a seminal preoccupation of visual arts discourse, has likewise evolved beyond what might be understood as an experience received through the visual stimuli of traditional media such as painting, sculpture, printmaking or photography, to more bodily forms of interchangeable contemporary practice that accept the whole producer (or artist) and the whole viewer (or participant, and vice versa) as experiential partners. Key to this development within the visual arts, is a recalibration of how and what we recognise as aesthetic experience. Moving beyond the received definition of form, surface, palette, composition (and multiple other visual qualities or analyses), arts practice now includes propositional forms of visual practice that engage more fully with the original, more transferable, definition of *aisthetikos,* which Buck-Morss (1992) describes as "perceptive by feeling" (*ibid.* 7)**.** This return to the ancient Greek origins of the term redresses the modernist approach,[3] where aesthetics was primarily applied to "cultural forms rather than sensible experience, to the imaginary rather than the empirical, to the illusory rather than the real" (*ibid*.). This modernist understanding of aesthetics continues to preoccupy the financially driven economy of the visual arts, although new seams of inclusive creativity have been redefined within the wider fields of socially engaged, performative and collaborative arts agendas (Bishop 2006; Thompson 2012).

Pre-empting these developments, Dewey's (134: 36) notion of situated aesthetic experience recognised that the basis of a non-hierarchical lived engagement with the production or experience of art, relied on the "interaction of live creature and environing conditions" (*ibid*.) where "every successive part flows freely, without seam and without unfilled blanks, into what ensues" (*ibid.* 37).

Dewey's thinking has evolved in to the interdisciplinary theories of new materialism (Bennett 2010; Van Der Tuin & Dolphijn 2010; Haraway 2016) and object oriented ontology (Harman 2017), where lived experience acknowledges the parity of human and non-human interactions, or 'intra-actions' as Barad (2007) calls them. The resynchronised worlds of new materialism and object-oriented ontology have been readily accepted into contemporary arts discourse and are already familiar within creative practice, where the process of making, haptic knowledge and engagement and exchange with materials and sites are familiar concepts to visual artists, musicians and performers.

Significant Walks reflected these new realms of experiential, lived, site based experience through the research team's mutual interest in the resonance of walking as an interpretive tool. The team came together in response to Chubb's (cf. Hilty *et al.* 1995; Patrizio *et al.* 1998; Chubb 2011), methodology of manifesting physical measurements of time and space within particular sites. This work had generated a number of site specific exhibitions, most pertinent here being her extensive work on the life and evolutionary legacy of Charles Darwin. Chubb's (2004) site-specific exhibition *Thinking Path,* took Darwin's daily ritual of walking the same path in the grounds of his family home as its inspiration, resulting in a composite work of 1400 images that considered his life and the expansive legacy of his theories. A second exhibition, *Pen Rest* (2014), further explored the empirical roots of Darwin's theories through ongoing engagement with UK sites of seminal relevance to his upbringing (Nicol 2014).

A Synthesized Qualitative and Quantitative Methodology

Initiated by the collaborative team of artist Dr. Shirley Chubb, musculoskeletal physiotherapy specialist Prof. Ann Moore, biomedical engineer Dr. Kambiz Saber-Sheikh and digital artist Neil Bryant, *Significant Walks* took place in two communities in Chichester and Brighton in the South East region of the U.K. The research generated an immersive digital artwork synthesizing eye level video documentation of participant's personal walks with simultaneously gathered biomechanical data. The research team worked with walkers to explore how the interpretive qualities of visual effects software could be applied to individually documented walks in order to express the nature and challenge of personal movement on regularly encountered walks. Open calls via the researcher's universities and via community magazines widely read in the urban centres of each city, recruited eight female and four male participants ranging in age from 26 to 64. The participants were variously part and full time employed or retired and rep-

resented a spectrum of socioeconomic profiles. Coming from a range of social and cultural backgrounds and taking a variety of work related and recreational walks, the participants often reported that their walk allowed space for reminiscence and reflection on past experience and ability. One participant had experienced a period of homelessness and returned to the rural environment that was his home during this time. One participant took an internal walk at a workplace, where the applied effects were extreme and reported as reflecting the anxiety and time pressure felt when managing CLBP in the work environment. By capturing real world experiences of this eclectic group of individuals within their chosen environments rather than laboratory-based simulations (Ingold 2007, 2010; Bunzli *et al.* 2013), the research manifested the raft of daily social, environmental and cognitive influences that impact on individual experiences of walking.

Fig 1: *Significant Walks* (2014). Exhibition, Otter Gallery, University of Chichester

The case for the research was underpinned by the authors' personal experience of the condition and the broader impact of CLBP which has been identified, globally, as one of the five leading causes of years lived with disability (Vos *et al.* 2017). As Maniadakis (2000) reported, the economic burden of low back pain has been known for some time and continues to be an area of particular economic and social concern, with an estimated 80% of people in the U.K. suffering with back pain at some stage in their lives. People with CLBP describe the problematic nature of legitimising their condition, feeling that people do not understand their experience and that, at times, they are not believed (Froud *et al.* 2014). The impact of chronic low back pain on sufferers can be profound with people describing a "loss of self" and the search to legitimise their pain for themselves, family and colleagues (Woby *et al.* 2007; Bunzli *et al.* 2013; Froud *et al.* 2014).

Collaboration between the artists, recruited walkers, a physiotherapy specialist and biomedical engineer provided the opportunity to realise onsite experiential accounts of the condition rather than relying on the constructed reality of laboratory-based simulations. Within this process the key research questions were:

How can art be used to explore the resonance of location, social context and life experience on the lived experience of CLBP?

How can synthesized digital technologies be used to document physiological and cognitive experiences of walking with CLBP?

How can the respective qualitative and quantitative research methods of each discipline be combined to manifest participants experience of CLBP and therefore develop enhanced insight, knowledge and greater understanding through creative enquiry and research methods?

The research methodology drew upon Solnit's (2001) insightful assessment that

> "Walking is usually about something else – about the walkers character or encounters, about nature or about achievement, sometimes so much so it ceases to be about walking" (*ibid.* 132).

The significance of walking challenged the research team to find a process that could encapsulate the interplay of experiential and contextual influences present within the act of walking with CLBP. A series of lab-based pilot studies tested the potential of coordinating the use of lightweight high definition video cameras to record eye level views of walks, with a simultaneous use of inertial sensors to monitor and collect posture and movement data. The twelve participants contributing to the project were invited to identify a familiar, regularly encountered walk of around ten to fifteen minutes duration and were accompanied by the research team recording video and biomechanical data throughout their walk. The use of video was important in capturing the individual

Fig 2: *Significant Walks* (2014): Subject 11 project walk

Fig 3: *Significant Walks* (2014): Subject 10 project walk

circumstance of each walker's lived experience and acknowledged Pink's (2007) and Skinner & Gormley's (2016) assertion that visual data can explore and represent the relationship between visual and other forms of knowledge about place, identity and status. In this context walking is seen as a physical challenge that can also act as a measure of memory, loss and achievement, becoming a metaphor for how participants, and consequently viewers, might understand our sense of engagement with the world as we consider how we internally and externally respond, interact and navigate through environments.

The simultaneous use of documentary and biomechanical technologies allowed the capture of movement and momentum within context, enacting Sheet-Johnstone's (2011) observation that

> "wherever there is animate movement, an individual of whatever order is not just doing something—'acting'—but is experiencing it kinaesthetically and/or proprioceptively" (*ibid.* 477).

The multifaceted nature of the research method captured intersecting data streams with its synchronisation enabling internal data to affect external documentation when adapted through the addition of visual effects by each participant. Most of the participants had minimal experience of using visual effects software although all had acquired IT skills and, with the support of the research team, responded well to the technology available. Two of the youngest participants (aged 24 and 36) were familiar and confident in the use of software and were able to develop their visual responses more independently once introduced to the process. As a whole the group produced variously nuanced responses as they developed visual adaptations of their synchronised footage.

Five stages of development brought the researchers and walkers together, with the initial session led by the author to provide an overview of the origins of the project and the processes and equipment that would be used. A schedule

Fig 4: *Significant Walks* (2014): Subject 12 project walk including research team monitoring data capture, Photo: Shirley Chubb

of walks was then agreed, with each individual taking their chosen walk accompanied by the research team who were collecting real time, onsite data throughout each walk. The second walk-site session required each walker to wear a small head mounted video camera alongside the use of miniature 3D inertial sensors taped across the participant's spine to collect kinematic data.

The resulting stream of continuous biomechanical data recorded the movement of the spine whilst one researcher prompted walkers to estimate their pain level on a scale of 1–10 at regular intervals during the walk. The walkers were also invited to comment on their reasons for choosing their walk with the memories and thoughts prompted by walking collected within the video documentation. This discursive element of data collection was crucial to encouraging each participant to discuss the significance of their walk, commenting on personal reminiscence or anecdote as well as the nature of the walker's physical experience at the time. The significance of each individual's walk was critical to this process as the synthesis of video documentation with kinematic pain data created tangible visual representations of the link between internal and external movement. Once each walk was completed the research team used rendering software to synthesize the documentary footage and kinematic data creating a blended film that could then be further adapted by each walker to represent their personal reflections and interpretation of pain whilst walking. At the third research session each participant was shown their synchronized film and was invited to consider how visual effects could be used to interpret the specific nature and challenge of their movement whilst walking their chosen route. Using laptops provided by the project, and with the help of the research team, each walker made choices from a menu of digital effects that could enhance the colour and saturation levels applied to their footage/data sets.

This key stage of the research process involved one to one interaction with each participant to introduce the range of available effects. Consequent support helped each participant to investigate how the use and duration of visual effects at different stages of their walk could communicate their individual experience of walking. Key to the process was how the kinematic data drove the effects applied to the video documentation, with the resulting films pulsating in direct correlation to each pace of a walk as the hybrid streams of video, data and visual effects became one seamless document of each walker's experience. Participants were then invited to a fourth meeting where, with the help of the research team, they could refine their choices and make any necessary changes to their footage.

These individual outcomes were then edited and combined to produce a cumulative video artwork featuring each participant's walk. A final fifth session provided the opportunity to discuss the edited composite film, with participants invited to reflect on how the process of monitored walking and the application of visual effects software to their individual films reflected their experience of walking with CLBP and helped them to understand, and potentially manage, their condition.

Case Studies

The case studies cited include comments on the project at the production stage and also at a post-production focus group, where only female participants responded to the invitation to discuss and reflect on the project. Their experiences are varied and show how some walkers focussed on effects to register discomfort or anxiety whilst others adopted more positivist approaches recording achievement and enjoyment and how this relieved stress.

Case Study 1: Participant 01

Participant 01 was a 51-year-old female working as a library resource assistant within a higher education campus library. At the time of the project, she had suffered with CLBP for 4 years and described "having to sit down and get up like an elderly person." (Interview 2013-04-13) Her back pain had significant impact on her quality of life, restricting her mobility and consuming much of her time in the careful management of physical activity. In a post-production discussion on living with CLBP she commented that "you're weary because you're [...] pushing through the pain barrier, you're not just occasionally having spikes of pain... I'm just tired, I'm mentally and physically tired." (Interview 2015-01-09)

Participant 01 was supported in her work environment where possible but found being in active external environments challenging, at times feeling vulnerable as her limited mobility made it difficult to respond to crowded or highly active environments (for example in one data collection session she was concerned by a cyclist passing close by her on the pavement). However, Participant 01 was also a resilient and determined individual who walks a significant distance (ca. four miles), to work and back on a daily basis. She saw her ability to maintain mobility as crucial to maintaining her professional life and took an active approach to managing her condition. She was interested in the research project as a means to understand her physical condition and also saw it as a way to show work colleagues that she was "taking the initiative to deal with a health problem that could be career-curtailing as worst and disruptive at best" (Interview 2013-07-19). Through habit and force of circumstance Participant 01 had developed an acute visual awareness of her environment and chose to use her daily journey to work as her subject walk. During data collection and the consequent manipulation of her synchronised documentation, she paid particular attention to street surfaces, carefully monitoring where pavement repairs resulted in uneven surfaces, and potential obstacles to her walk such as refuse bins. She also frequently glanced around her to make sure that faster walkers didn't force her to stop abruptly as this was a painful process for her. She had also developed other internalised methods to manage the discomfort of walking, most significantly her habit of playing out the rhythm of music in her head to pace and preoccupy her and to mitigate against the "ever-present ache and intermittent bolts of pain" whilst walking. (Interview 2013-07-19)

Participant 01 became every involved in the research process and appreciated the sense of engagement and community that it offered to her. She initially contributed her regular walk to work and followed this by taking a second recreational walk where the visual effects applied to her footage were in stark contrast to her daily walk to work. The former applied careful delineation of the walk, making specific changes in effects across the duration and terrain of the walk. For instance, from a tunnel effect whilst stationary at junctions, as pausing within a walk was uncomfortable, to an intense pulsating spherical interference in the video whilst walking uphill. For the second, recreational walk the effects used were softer, more positive in feel and included negotiating the inclusion of a key word at the start of the walk to reflect the sense of ease and positivity felt when walking in a less crowded or time limited setting.

In the post-production discussion Participant 01 contributed a range of commentaries including the sense of empathy and enlightenment she felt in response to the project and how reflecting on the relationship between the oscillation of her biomechanical data and the resulting intensity of visual effects had shown her

> "how one side was more obvious that than other side, I'd never known that before. And that was a revelation to me [...] That kind of knowledge helps you to deal with the thing, adding further that all these things are like building up knowledge about myself that no GP or specialist in the MRI clinic is going to tell me [...] It's very useful to understand

the physical pain and help you mentally deal with it." (Interview 2015-01-09)

Case Study 2: Participant 03

Participant 03 was a 46-year-old female administrator who had been living with CLBP since injuring her back as a child during a sports activity. She described how her condition impacted on her work life where the sedentary nature of her job could cause stiffness and discomfort. She also reported that interaction with her young daughter was problematic at times as she could not move quickly or spontaneously. Participant 03 chose the daily walk to collect her daughter from school and described this regular walk as beneficial in loosening her up after a day at work with increased mechanical mobility meaning that painful twisting became less likely. She also commented that this walk provided relaxed time with her daughter during otherwise busy schedules.

Participant 03 developed a sensitive adaptation of her synchronised footage, bringing together both positive and negative aspects of walking by making use of a variety of visual effects. She made specific references to short passages of the walk as exemplary of particular issues when walking with her daughter. For instance, one passage of walking prompted an awareness of the flexibility she had lost and how in watching her daughter "jump and run around and [...] climb over the wall and not think twice about it", she would "always get to that bit and think, oh I wish I could do that." (Interview 2015-01-30)

Throughout the research it was clear that Participant 03 took an anticipatory approach to walking, recognising potential problems and adjusting to accommodate each change to the walking surface such as exposed tree roots, street furniture or inclines. She described this process as

> "like mild stress, that kind of how or where I'm walking what's going to happen, what if it's going to be uneven, where is it going to be uneven [...] because you can't actually always tell" (Interview 2015-01-30).

She found the research process thought provoking and enabling, enjoying the opportunity to talk and recognise the experience of others during social and focus group discussions. In reflecting on her adapted footage she enjoyed the opportunity of taking time to

> "think about the fact that it's just one part of the day, one little journey, but it's something I do regularly. [...] And that you don't often focus on how you are physically until you stop or something makes you stop" (Interview 2015-01-30).

Continuing to add that "doing this made me stop and think about the fact, oh this is what happens to my back, this is the effect it has [...] but I hadn't really stopped and thought about how much it affects what I chose to do" (Interview 2015-01-30). Participant 03 also noted that taking part in the project, and the visualisations of her condition that resulted "kind of drew a line for me [...] I realised what the impact [of CLBP] was and since then [...] I've been trying to do things to help myself a bit more." (Interview 2015-01-30)

Case Study 3: Participant 07

Participant 07 was a 41-year-old occupational therapist who has lived with CLBP for 20 years. Her condition was pervasive and all consuming (she reported a 10/10 when pain was at its worst), and affected her when moving or stationary, with working at a computer being particularly problematic at times. Her professional experience meant that she was familiar with some work-based issues relating to her condition and that her father's similar experience had given her some medical reference points.

She was also affected whilst walking outdoors and reported that CLBP meant that she was often anxious about being in unfamiliar places. She had experienced relatively pain free periods for a number of months but that these were "followed by periods of constant (though changing) pain for months [which] is depressing because I don't know why it suddenly comes back and whatever I do in terms of management (exercise, relaxation, hot/cold, daily stretches, pain relief), doesn't make it go away." (Interview 2013-04-13)

Participant 07 took a very contemplative approach to walking a familiar rural route close to her home as her walking subject and walked barefoot resulting in an enhanced symbiosis of pace and place that was delicately communicat-

ed as she carefully placed her feet to the ground throughout her walk. She used her walk as a measure of ability, reporting that she responded to her physical state during these regular walks grading "how bad things are by how much that I can do." (Interview 2015-01-30) Walking was an integral part of her schedule and she reported

> "even if I can just get out to that very first bit I feel like life's going to be alright, and I can still get outside, and you know just being in nature, will just cheer me up, but the further along that I manage to go the more I feel like, okay I'm not just going to be house bound or you know unable to walk and [...] so it's kind of like a therapy." (Interview 2015-01-30)

The effects Participant 07 chose were linked to positive feelings of being aware of and at times overcoming pain. Her film had a tangible sense of rhythmic pacing with the use of visually soft effects subtly animating her rural surroundings, producing a sense of her being in tune with the natural environments she enjoyed. Although perhaps one of the more subtle visual interventions, Participant 07's manipulation of data often held viewer's attention as she walked through a verdant edgeland landscape with gently rolling inclines and, at times, overgrown pathways. In reflecting on her adapted film Participant 07 commented that the effects used were depicting

> "an awareness of my back and they were sort of rhythmic things [...] like I would feel the muscle in my back or if there's a particular point [...] I would feel it rhythmically as I'm going along" (Interview 2015-01-30).

For Participant 07 the opportunity to reflect anew on her condition and, importantly, see the results of that reflection, were enabling. She pinpointed particular phases of her walk with real accuracy commenting that, when going uphill

> "I feel like I can achieve something, so psychologically even though there's more pain [...] I feel like maybe it's a way of thinking, I'm coping with this pain, it's still a way of getting up this hill, even though I can feel that point in my back quite clearly." (Interview 2015-01-30)

The Realisation of Phenomenology and New Materialism

The above case studies encapsulate how participants realised the experiential impact of the research when adapting their footage. The objectivization of each walking experience, externalised and viewed on screen, allowed them to recognise and animate cognitive aspects of their walking experience, indicating new levels of insight into the impact of CLBP for physiotherapists. In embracing visual outcomes as a means to reflect on their walking, the Case Studies indicate how participants were able to bridge the gap between the biomedical understanding of the lived experience of CLBP and the impact and significance of the biopsychosocial nature of living, functioning and managing the condition (Bunzli *et al.* 2013).

The recalibration of what and how data was gathered, with an emphasis on taking the research out of constructed laboratory conditions and into the real world, enabled a more immediate understanding of the impact of daily experiences of walking with CLBP within urban and rural environments. Although supported in her workplace, Participant 01 often found her external urban environment challenging, with street furniture, traffic and other road and pavement users at times impacting on her sense of progression and confidence. In contrast, her second recreational walk embraced the positivity of her whole environment, as vividly captured in her addition of the word "alive" to a seafront promenade (see Fig. 7), acknowledging an enabled mindset that was able to reflect on the positivity of her wider life experience and cultural heritage. Manifesting what Dewey (2005) recognises as the "dependence of the self for wholeness upon its surroundings" (*ibid.* 61), Participant 01 also reflects how the immediacy of visual representation can encompass a multiplicity of experience. In this way the personalised footage of her walking encounters reflect Bennett's (2010) consideration of new horizons of agency that move beyond the human, acknowledging Merleau-Ponty's awareness of "motor intentionality" and the "agentic contributions made by an intersubjective field" (*ibid.* 30). Likewise, Participant 01's reflective reengagement with familiar landscapes can be seen to manifest what Bennett advocates as a widen-

ing framework of experience that includes the non-human influence of other vital or "vibrant" materialities (*ibid.*).

The experience of Participant 03 also revealed how the significance of place and company (in this case the company of her daughter), can prompt enhanced understandings of past and present physical abilities. The lively, playful walking of her daughter allowed Participant 03 to meaningfully reflect on her own comparative experience, initially considering the impact of CLBP and her own compromised flexibility. However, the consequent process of reviewing and manipulating the documentation of her walk led to her realisation that an embodied engagement with place allowed a heightened sense of agency in how she might actively manage her condition. The lines of communication between her understanding of her own ability and that of her daughter, experienced across a repeatedly walked route between home and school, reflects Bennett's (2010) suggestion of a wider field of inclusion where, (revisioning Bruno Latour's term) the "actants" enmeshed within an environment, create a vital materialism "with more channels of communication between members" (*ibid.* 104).

Participant 07's choice of walking barefoot indicated an acute sense of connectivity and trust in a familiar landscape, reflecting Merleau-Ponty's (1996) consideration of being "thrown into nature, and that nature appears not only as outside me [...] but is also discernible at the centre of subjectivity" (*ibid.* 346). Her sense of connectivity when walking was felt rhythmically (a sensation echoed in Participant 01's account of matching the rhythm of music to her walking pace), indicating a kinaesthetic self-awareness that was further echoed in the process of footage manipulation where the use of shimmering visual effects animated her sense of moving through and "being in nature." This heightened sense of communication through visual rather than spoken or written accounts of walking experience, captures what Sheets-Johnstone (2011) describes as "an aliveness that language [...] can and often does fail to capture" (*ibid.* 435).

The case studies indicate how the methodology embraced walking as an arts practice that could act effectively as an interface for communicating biomedical knowledge (cf. Walking Artists Network). Situated within contemporary site specific arts practice (O'Rourke 2013; Fulton 2020; Long 2020; Prodger 2020), the research simultaneously created conceptual partnerships between artists and physiotherapists with the phenomenological basis of the work (Merleau-Ponty 1996; Moran 2000; Weiss 2008; Diprose & Reynolds 2009) providing a key element of connectivity for the interdisciplinary expertise that each researcher brought to the project. Importantly, the methodology also pushed at the boundaries of discourse surrounding patient-centred agendas, with the participants and researchers co-dependently creating new understandings that relate to the health sciences and health psychology (Murray 2015; Carel 2016a,b; VOS *et al.* 2017). The expanded process of active, site-specific interview and documentation additionally speaks to current debate in sociological, anthropological and ethnographic discourse (Coles 2000; Ingold 2004, 2011a,b; Pink 2007; Urry 2007).

Whilst phenomenology addressed the human within the research, as the project evolved and continued to be disseminated in a variety of contexts, the relevance of the new materialist agenda became apparent, acknowledging the permeable nature of the research. Participants, researchers, technologies, sites and the environmental context of each encounter constituted a whole, hybrid experience where no one element could be recognised without being seen through the visual conduit and agency of the other human and non-human partners in action. Haraway (2016) uses the term *sympoiesis* to encapsulate this thinking, seeing the term as "proper to complex, dynamic, responsive, situated, historical systems [...] for worlding-with, in company" (*ibid.* 58). These discussions (Bennett 2010; Van Der Tuin & Dolphijn 2010; Haraway 2016; Harman 2017; Ferraris & Terrone 2019) are defining new systems of thinking that move beyond the anthropocentric to conjoin objects, materials and environments with the human as co-dependent, co-affecting and co-responsive partners of experience.

Conclusion

Significant Walks was predicated on the "vision" of the participant to record highly individualised reflections on the compromised nature of walking with CLPB in a variety of rural and urban envi-

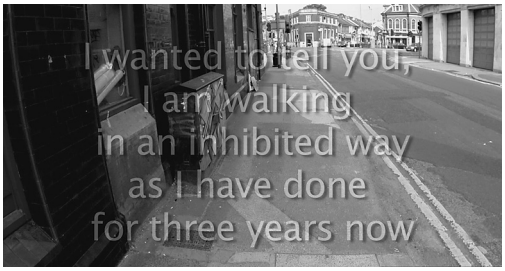

Fig 5: *Significant Walks* (2014): Subject 01 (walk #1), still of footage including digital effects and participant statement

Fig 6: *Significant Walks* (2014): Subject 03, still of footage including digital effects and participant statement

ronments. Each individualised account generated a unique, holistic account of walking through the incorporation of internal and external movement data. Quantitative biomechanical data recording the movement of the spine was synthesised with simultaneously recorded qualitative data capturing each walker's environment, with the consequent application of interpretive visual effects capturing individual responses to each walking experience. In this way the aesthetic of the research was multi-faceted, with each walker's documentary film enmeshed and unfolding from the internal source of the body. This process created an enhanced visual awareness of movement through particular environments as each walker sought ways to represent their cognitive sensory response to their body in motion and in context. These blended responses were intriguingly objective and subjective, realising Barad's (2007) notion of intra-activity, as each participant's internal biomechanical data rippled out to affect the perception of their chosen walk-site. Each walker, when presented with their footage saw their environment afresh and used their interaction with the embedded but "invisible" internal monologue of biomechnaical data recording their movement to affect their representation of walking through visually reconfigured external environments. Key to the realisation of the research, was the recognition of technology as an enabling, immersive and inclusive tool that democratises experience and the dissemination of outcomes (Hansen 2006; Alexenberg 2008; Stern 2013).

Significant Walks relied on a wholly collaborative approach reflecting aspects of the inclusivity of new materialism (Bennett 2010; Haraway 2016) alongside the formative use of technology to enable liberated, interactive, democratic understandings of self, site and circumstance. The research created knowledge that was "experientially exploratory" rather than "goal orientated" (Stern 2013: 48). By applying a new experiential rubric that relied on collaboration as the basis of shared knowledge, the research also challenged how contemporary visual practice often views the aesthetics of production through the lens of "lone" experience.

Significant Walks showed that collaborative interdisciplinary expertise and the use of emerging technologies to manifest quantitative and qualitative data can democratise the understanding of CLBP within lived environments. The research developed enhanced knowledge and understanding between health professionals, participants and the viewing public and the research was widely disseminated across subject disciplines promoting an increased understanding of a frequently misunderstood and misinterpreted condition within wider health-related and public communities. The innovative methodology, which to our knowledge has not be carried out before, indicates developing understanding, particularly in the field of Musculoskeletal problems. The visual and academic outcomes of the research addressed aspects of new materialism by remapping the body as a blended experience of internal movement permeated by a recalibrated awareness of surrounding environments. The participant walkers contributing to the project felt enabled by the research process, both in developing enhanced self-awareness and the consequent potential to manage their condition more effectively. The collaborative and co-dependent nature of the research relied on a synthesis of content as internal biomechanical data interacted

Fig 7: *Significant Walks* (2014): Subject 01 (walk #2) still of footage including digital effects participant statement

with the visual documentation of urban and rural sites. Bringing together researchers and participants as co-dependent producers responding to particular environments, the research recalibrated post-modern aesthetics through a return to the origins of the term *aisthetikos* as a rubric that understands sensory experience as legitimate, multifaceted knowledge.

Notes

1 *Significant Walks* was funded by the Wellcome Trust https://wellcome.org/
2 Here the creative disciplines include visual art, craft, design, film, dance and music.
3 The period of social and cultural "modernism" which we refer to, began in the early twentieth century and saw artists exploring new imagery, techniques and materials as they sought to reflect the "realities and hopes of modern societies" (cf. Tate 2021)

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References

Alexenberg, Mel (ed) 2008. *Educating artists for the future: learning at the intersections of art, science, technology and culture*. Bristol: Intellect.
All Party Parliementary Group on Arts 2017. *The Inquiry Report, Creative Health: The Arts for Health and Wellbeing*. 2nd edition.
Barad, Karen 2007. *Meeting the universe halfway: quantum physics and the entanglement of matter and meaning.* Durham: Duke University Press.
Bennett, Jane 2010. *Vibrant matter: a political ecology of things*. Durham: Duke University Press.
Biggs Michael & Henrik Karlsson (eds) 2010. *The Routledge companion to research in the arts.* New York: Routledge.
Bishop, Claire 2006. *Participation*. London: Whitechapel.
Bourriaud, Nicolas 2002. *Relational aesthetics*. Dijon: Presses du Réel.
Buck-Morris, Susan 1992. Aesthetics and Anaesthetics: Walter Benjamin's Artwork Essay Reconsidered, *October* 62: 3–41. doi: 10.2307/778700.
Bunzli, Samantha *et al.* 2013. Lives on Hold: A Qualitative Synthesis Exploring the Experience of Chronic Low-back Pain. *The Clinical Journal of Pain*, 29, 10: 907–916.
Carel, Havi 2016a. *Illness: the cry of the flesh.* London: Routledge.
––––– 2016b. *Phenomenology of illness.* Oxford: University Press.

Chambers, Emma 2009. Fragmented identities: reading subjectivity in Henry Tonks' surgical portraits. *Art History* 32, 3: 578–607.
Chubb, Shirley 2004. *Thinking Path*. Shrewsbury: Museum Service.
———— 2011. Location and intervention: visual practice enabling a synchronic view of artefacts and sites. In S. Dudley *et al.* (eds), *The Thing about Museums: Objects and Experience, Representation and Contestation*. London: Routledge. 199–213.
Coles, Alex (ed) 2000. *Site-specificity: the ethnographic turn.* London: Black Dog.
Dewey, John 2005. *Art as Experience*. London: Penguin.
Diprose, Rosalyn & Jack Reynolds (eds) 2009. *Merleau-Ponty: key concepts*. Stocksfield: Acumen.
Ferraris, Maurizio & Enrico Terrone 2019. *Cinema and Ontology*. Milan: Mimesis.
Froud, Robert *et al.* 2014. A systematic review and meta-synthesis of the impact of low back pain on people's lives. *BMC Musculoskeletal Disorders* 15, 1: 1–15.
Hansen, Mark 2006. *New philosophy for new media*. Cambridge: MIT.
Haraway, Donna (2016) *Staying with the trouble: making kin in the Chthulucene*. Durham: Duke University Press.
Harman, Graham 2017. *Object-Oriented Ontology: A new theory of everything*. London: Penguin.
Hilty, Greg *et al.* 1995. *Hold: acquisition, representation, perception: work by Shirley Chubb*. Brighton: Green Centre for Non-Western Art and Culture at the Royal Pavilion, Art Gallery and Museums.
Ingold, Tim 2004. Culture on the Ground The World Perceived Through the Feet. *Journal of Material Culture* 9, 3: 315-340.
———— 2007. *Lines: a brief history*. London: Routledge.
———— 2010. *Making: archaeology, anthropology, art and architecture*. London: Routledge.
———— 2011a. *Being alive: essays on movement, knowledge and description*. London: Routledge.
———— 2011b. *The perception of the environment: essays on livelihood, dwelling and skill*. London: Routledge.
Johnson, Mark 2010. Embodied Knowing Through Art. In M. Biggs & H. Karlsson (eds). *The Routledge companion to research in the arts,* 1st ed. New York: Routledge: 143–151.
Mandiakis, N. & A Gray 2000. The economic burden of back pain in the UK. *Pain* 84, 1: 95–103.
McNiff, Shaun (ed) 2013. *Art as research: opportunities and challenges*. Bristol: Intellect.
Merleau-Ponty, Maurice 1996. *Phenomenology of perception* London: Routledge.
Moran, Dermot 2000. *Introduction to phenomenology*. New York: Routledge.
Murray, Michael 2015. *Critical health psychology.* Hampshire: Palgrave Macmillan.
Nicol, Gill 2014. *Inspired by: your guide to art and the museum*. Shrewsbury: Museum & Art Gallery.
O'Rourke, Karen 2013. *Walking and mapping: artists as cartographers*. Cambridge: MIT.
Padfield, Deborah *et al.* 2018. Images as catalysts for meaning-making in medical pain encounters: a multidisciplinary analysis. *Medical Humanities* 44, 2: 74–81.
Padfield, Deborah 2020a. Absence and presence: the potential for art to facilitate improved communication about pain. *The Lancet Haematology* 7, 2: 96–97.
Pallasmaa, Juhani 2009. *The thinking hand: existential and embodied wisdom in architecture*. Hoboken: Wiley.
Patrizio, Andrew *et al.* 1998. *New work: Polly Binns and Shirley Chubb*. King's Lynn: Arts Centre.
Pink, Sarah 2007. *Doing visual ethnography: images, media and representation in research.* London: Sage.
Sheets-Johnstone, Maxine 2011. *The primacy of movement.* Amsterdam: Benjamins.
Skinner, Jonathan & Gerard J. Gormley 2016. Point of view filming and the elicitation interview. *Perspectives on medical education*. 5, 4: 235–239.
Solnit, Rebecca 2001. *Wanderlust: a history of walking.* London: Verso.
Stern, Nathaniel 2013. *Interactive art and embodiment: the implicit body as performance*. Canterbury: Gylphi.
Thompson, Nato 2012. *Living as form: socially engaged art from 1991–2011*. Cambridge: MIT.
Urry, John 2007. *Mobilities.* Cambridge: Polity.
Van der Tuin, I. & R. Dolphijn 2010. The Transversality of New Materialism. *Women: A Cultural Review*. 21, 2: 153–171.
Vos, Theo *et al.* 2017. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. *The Lancet* 390, 10100: 1211–1259.
Weiss, Gail 2008. *Intertwinings: interdisciplinary encounters with Merleau-Ponty*. Albany: State University of New York Press.
Woby, Steve *et al.* 2007. The relation between cognitive factors and levels of pain and disability in chronic low back pain patients presenting for physiotherapy. *European Journal of Pain*. 11, 8: 869–877.

Online Resources

Chubb, Shirley 2021. Artist website. https://www.shirley-chubb.co.uk/ [20.01.2021]
Fulton, Hamish 2020. Artist website. http://www.hamish-fulton.com/ [27.07.2020]
Long, Richard 2020. Artist Website. http://www.richardlong.org/ [27.07.2020]
Macek, Barbara (no year). Between Agony and Ecstasy: Investigations in to the meaning of pain. https://www.researchcatalogue.net/view/308804/470238 [27.07.2020]
Padfield, Deborah 2020b. Artist Website. https://deborahpadfield.com/About [20.07.2020]
Prodger, Charlotte 2020. Tate Website. https://www.tate.org.uk/whats-on/tate-britain/exhibition/turner-prize-2018/charlotte-prodger [21.07.2020]
Significant Walks 2014. Project Website. http://significantwalks.com/ [20.07.2020]
Spence, Jo 2020. Tate Website. https://www.tate.org.uk/art/artists/jo-spence-18272 [20.072020]
TATE 2021. https://www.tate.org.uk/art/art-terms/m/modernism [14.01.2021]

WALKING ARTISTS NETWORK (no year). Website. https://www.walkingartistsnetwork.org/ [21.07.2020]

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