

A Gadamerian approach to interpreting pain: model-making metaphors through embodied cognitive theory.

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ABSTRACT

This paper will discuss how the conceptualization of embodied, abstract notions such as pain, which is multi-modal, non-visual and subjective, has the potential to be communicated visually using model making, as it is traditionally understood in the fields of architecture and design. We propose a new methodological approach to research where Gadamer's understanding of intersubjective interpretation (2004) used in conjunction with Simulation theory (Gallese and Goldman 1998) in embodied cognitive science, provides a strong framework in which to formulate a palette of materials and forms to visualize subjective experience. This novel approach to design research is currently being undertaken within the field of Health Sciences to produce metaphorically provocative, descriptive models of the lived experience of people with Rheumatoid Arthritis (RA) to help bridge the gap in understanding between the sufferer and the public.

This paper seeks to engage briefly with two questions integral to the research being undertaken; how does one understand another's pain, and how can one conceptualize and communicate abstract notions such as pain visually using material and form as language?

INTRODUCTION

RA is a chronic, inflammatory disease, principally affecting flexible joints though it also affects internal organs and other parts of the body. RA is, potentially, extremely painful, inducing extraordinary fatigue. If not adequately treated it can lead to substantial loss of functioning, mobility and increased mortality. Treatment and coping strategies rely heavily on understanding and communication (Arthritis research UK 2016; NRAS 2016; arthritiscare.org 2016). However, despite the seriousness of the disease, the 'symptoms can be visibly subtle, making it difficult to understand... Too often, even doctors doubt how much RA patients endure' Rheumatoid Patient Foundation (2016, p.2). By increasing the awareness of how it feels to suffer from RA more can be put in place, to help those who do, to cope with the disease. It is our intention to produce material models which create an alternative to spoken word or text as a direct means of communicating the experience of RA to others. The intention here is to improve understanding about living with Rheumatoid Arthritis in the public realm in line with the current aspirations of leading RA charities and organizations. In improving communication we also see benefits for the health professions (National Rheumatoid Arthritis Society 2013, Arthritiscare.org.uk 2015, Arthritisresearch uk.org 2015, Rheumatoid Patient Foundation 2016).

Gadamer described text as meaning which had 'undergone a kind of self-alienation through being written down' (2004, p.393) and it was the transformation back into meaning that he considered to be hermeneutic. The approach here is to first gain this understanding through meaning found within the text, transcribed from interviews with people suffering from RA. Then, still involved in the dialectic movement between the text, participant and ourselves, to seek an alternative means of interpretation, models that convey sensory experience understood through a hermeneutic phenomenological process rather than an illustration of a subjective point of view.

One significant advantage of using material (physical) models over digital representations is that they are a much richer source of information, providing not just three-dimensions (form, scale,

texture) to present information but the opportunity to use a host of properties from the sensual world with historical, cultural/semantic and personal memories and connotations (Gibson 1954; Merleau-Ponty 2002; Dunn 2005; Paradis 2013). Such models are metaphorically provocative (Lakoff 1990; Lakoff and Johnson 1980, 1999, 2008) and evoke an emotional and tactile connection and a more embodied, multi-modal understanding (Merleau-Ponty 2002; Seamon 2010).

Gadamer's approach to aesthetic appreciation is phenomenological as he looks for art's position in our experience and understanding of the world; it is, however, not an understanding of the types of subjective pleasure that one can derive from art but what objectively informs subjective awareness (Gadamer, 2004).

According to Gadamer, interpretation does not revolve around text alone, but also involves the human being who does the interpreting and this person's interaction with the world (ibid.). Gadamer saw the inherent interrelations of the human body, their situation, and language (ibid.). Our interactions are constrained by the structure of our body. Our bodies shape every understanding that we have of our environment and those around us. Our thoughts, imagining, ambitions and memories are integrally linked to the world around us and it therefore follows that conceptualization is embodied (Lakoff and Johnson 1999). Our situation, our 'lifeworld' (Husserl 1970) directly reflects not just what we think but who we are. Such a hermeneutic concept in science is reflected in embodied cognition.

In 1996, the biologist, neuroscientist and philosopher, Francisco Varela proposed a need for a methodology marrying "modern cognitive science and a disciplined approach to human experience" (1996, p.330). In seeking a way to place first person perspectives into cognitive science, where he saw an "intrinsic circularity" (ibid, p. 347) that undermined the validity of observational investigation, Varela drew on Husserl's approach to phenomenological reduction, seeing the empirical in the essence. 'Neuro-phenomenology' (ibid.) was his solution to empirical science's dilemma of having to

draw on lived experience in order to study any mental phenomena, attempting to ground subjective consciousness in an objective framework.

However, rather than applying the method of phenomenological bracketing to further cognitive understanding, the approach here applies contemporary, embodied cognitive theory to further the understanding of interpretation. We question the philosophical commitment to the concept of bracketing, the suspense of critical judgment and a temporary refusal of critical engagement that brings in the researcher's own assumptions and experience (Spinelli 2005). Although seductive to science as a rigorous method, phenomenology underplays the social, cultural and historical context integral to hermeneutic understanding (Gadamer 2004) and situated/embodied cognition (Shapiro 2014).

We see Barsalou's situated simulation (Barsalou 1999; Barsalou et al. 2003), Goldman and Gallese's mindreading (1998) and Glenberg's sensory awareness of our environment, (Glenberg 1997)' all drawing on experiential engagement with the world, sitting more comfortably with Gadamer's hermeneutic philosophy, a search for meaning through intersubjective positioning, than Husserl's phenomenology, a search for the essential/prime meaning behind each experience of the world. An appreciation of these scientific approaches to understanding experience and meaning-making provides new perspectives for research of lived experience through design practice.

UNDERSTANDING ANOTHER'S PAIN

'Self-projection' (Buckner and Carroll 2007), or transposition (Gadamer 2004), the mental act of contemplating an other's mental state, relies on our imagination contextualizing within social and cultural situations (Goldman and Jordan 2013) as opposed to empathy, which is an experiential understanding rather than conceptual. We express and calculate pain through imagining and

imagery, visualizations tied to our lived experience of a world in which pain and language are tied together through culture (Csordas 1994).

Empathetic representations are subjective, drawing on personal experience. Alternatively, by using models where the materials and forms are translations of the lived experience of participants in the research, rather than searching for subconscious comparisons, 'have I felt like that?', an understanding, in Gadamerian terms, can be made of what that experience feels like; Gadamerian in that the understanding is a new perspective of the world which enables critical reflection on our prejudices. . This understanding is based on the experience of art within a structure of play, an act of desubjectification put forward by Gadamer (2004), where the subject is able to question and validate their preconceptions. The subject finds understanding through dialogue with the model and meaning in the relation of this to previous embodied experience, in the context of their social, cultural and historical understanding.

Phenomenologically speaking we don't normally experience our body or pain as objects; we find ourselves 'in pain' (Merleau-Ponty 2002, p. 107; Strong et al. 2009). Pain is more than a stimulus and the resulting sensory perception. Pain starts with potential, a realization, leading to a response/vocalization, an attempt at avoidance and then the initial self-soothing and continues, lasting beyond sensory perception (Melzac, 1965).

Culturally we communicate pain through imagining and imagery, metonymically using the cause and effect of pain to counter balance its subjective and poorly delineated qualities (Semino 2010). . In assessment we have tendencies to rely on scientific metaphorical systems to enable a calculation of description (Melzack 1975, Gould et al. 2001) rather than through our lived experience of a world in which pain is suffering. When discussing imagining pain, our own or others, it is not meant in a derogatory sense of fantasising; instead it is using creative, embodied imaging to express a believed, if unperceivable state.

Goldman referred to this as enactment imagination (2006) where we ‘conjure up what it is like to experience that state...to *enact* that very state’ (Goldman and Jordan 2013, p.15). Gaut and Livingston (2003) described it as experiential imagining. Rather than entertaining a proposition or concept, imagining with a ‘distinctive experiential aspect’ (ibid. p.273) entails a sensorial, phenomenal engagement by imagining both what something may be perceived as and what it may be like to feel that something or how that something could make one feel. Gaut explained that it is imagery that gives experiential imagining its sensory characteristics. Imagery here is not necessarily a mental image as in remembering or in perceiving, which would be an asserted thought but in having an unasserted thought, something that exists in a thought context, even if not in reality (ibid.). Simulation theory, as an attempted interpersonal re-enactment or ‘mind reading’ (Goldman 2006) captures this idea of mental pretence of trying to construct in oneself a mental state that isn’t generated by action or perception (Goldman and Jordan 2013).

Such a cognitive act, however, is prone to errors where the mind reader’s own, genuine beliefs and presumptions become entangled with the pretend states they put forward (ibid.). If we try to imagine ourselves being in the painful situation of another it is difficult to avoid making assumptions as to what we think it should be like, merely hypothesizing on being in pain. These fallibilities are reduced if the mind reader is provided with ‘perceptual cues’ as the imaginative act becomes more grounded within an embodied understanding (Zaki and Ochsner 2012; Lombardo et al. 2010).

Perceptual cues for pain come from metaphoric relationships, such as thumping or stabbing pains categorized in linguistics as PAIN IS CAUSES OF PHYSICAL DAMAGE¹ (Semino 2010, see also Scarry 1985), from objects such as needles, pins or sharp edges, THE NATURE OF AN ENTITY IS ITS SHAPE (Grady 1997), or from potential situations such as signs of future pain, a missing manhole cover, a broken ladder rung, for example. Cognitive and neuroscience have shown how the processes and

¹ In linguistics, to differentiate metaphors as descriptions and metaphors as grouping or classes of metaphor the latter are formatted as capitals as shown in the text.

products of visual perception and visual imagery have a substantial overlap (Kosslyn 1994), that visualizing strongly resembles vision. To visualize something is to construct an image that resembles the visual experience you would undergo if you were actually seeing what is visualized. To visualize a knife is to create a mental framework that enacts you seeing the knife.

In 'Perceptions of Pain', Padfield (Padfield et al. 2003) used this approach of literal visualization to produce photographic images in consultation with sufferers of chronic pain. By visualizing metaphorical descriptions literally she prompts the viewer to mentally reconstruct the chosen scenarios. However, similarly to the McGill Pain Questionnaire (Melzack 1978), which calls on the sufferer to adjectively categorize their experience linguistically, such images objectify pain sensation, decontextualizing the description from the lived experience; rather than being an understanding, it is an empathetic response mechanism. In attempting to understand pain as a quantitative symptom or through analogies, its true complexity that of a lived experience is lost. In seeking to describe the experience of pain we need to fall back on metaphor, trying to stimulate a context that adjective descriptors cannot bring.

Medical image references to pain are little better. Metaphorical visualizations of how pain works, nerves in terms of circuitry connecting the world to our internal mental state have come to dominate what we think of as pain (Neilson 2015).

Yet the cause of pain is not the same as the experience of pain (Couceiro-Bueno 2009; Csordas, 1994; Jackson 1994). To visualize another's pain it needs to be seen in context, an experience as part of the lived experience which phenomenological understanding provides.

In neuroscience such an act is called 'self-projection' (Buckner and Carroll 2007) and, in combination with our ability to imagine past, future or fictitious experiences (Frith and Frith 2003) it relies on our imagination contextualizing within social and cultural situations (Goldman and Jordan 2013).

Philosophically this act can be understood as transposition; to be able to see the world from another's point of view with the acceptance that this view, the other's, is different (that it is not one's own)(Gadamer 2004).

HOW CAN ONE CONCEPTUALIZE AND COMMUNICATE PERCEPTIONS OF SUBJECTIVE EXPERIENCE USING MATERIAL AND FORM AS LANGUAGE?

Barsalou's Perceptual Simulation Theory (1999) claimed "the processing of all language, whether literal or nonliteral, is accomplished through the partial simulation of associated bodily states, actions, and sensory perceptions" (El Refaie 2015, p. 64). In other words we understand, conceptualize, by simulating embodied experience as opposed to the concept that "the images that image metaphors apply to [relate to acquisitions of those images as conventions] unconsciously and automatically acquired over the years" (Lakoff 1987, p.219)

Barsalou (1999) stated that when we act or engage with the world symbols are activated. Symbols here can be understood as schematic neural representations of embodied action (Barsalou 1999) rather than any form of semiosis. These symbols are multi-modal but aren't holistic, they are parts of a whole not a representation of the whole experience of a thing; the weight of a mug, the feel of porcelain against the lip rather than the experience of having a cup of tea. The collection of these symbols, and the parts of the whole they serve, develops through our selective attention to an action, the more involved our usage of a thing or the more time spent in a situation the more specific the symbols that develop.

However, Perceptual Simulation theory is what is known as a bottom-up cognitive theory. It implies that in comprehending sensory input, linguistic or otherwise, we automatically first categorize, based on embodied experience, and then we focus on the singular. As Merleau-Ponty stated, when

we try 'to seize "sensation"...we find a formation already bound up with a larger whole, already endowed with a meaning' (2002, p.9). In this way our experience, our memory informs our senses.

Glenberg sees the purpose of memory to enable 'the organism to make sense of its environment so that it can take action appropriate to constraints resulting from the physical, personal, social, and cultural situations' (Glenberg 1997, p. 41). Meaning is inherent within material because the true context of a material, from whence it gains meaning, is within these embodied and situated events. Material is like language. As with Gadamer's claim that we are born into language (1992) we are also born into a material culture. It is more flexible semiotically, but as an interaction it comes before our prescribed understanding, before reflection, in an already formed socio-cultural grounding..

Recent research investigating how designed products convey emotive qualities (Chang and Wu 2007; Van Rompay and Ludden 2015) draws on anthropomorphism (Aggarwal and McGill 2007; Guthrie 1993), including meaning portrayal through action and movement, image schemas and symbolic meaning similar to Arnheim's Gestalt theory of expression (1949) though more heavily based on Conceptual Metaphor Theory (Lakoff and Johnson 1980, 1999). It also mentions the experience of materials through sense.

This meaning stems from usage over time or 'habit' (Benjamin 2008), reflected in familiarity and expertise, age and gender (Karana, 2009). It also stems from metaphorical connections threaded together by history, a collective memory, 'a sediment of cultural values' (Manzini 1986, p32). This was understood by Gibson (1954) as cultural affordance, that the cultural world through our acquired cultural skills is also correlative with our body. He uses the example of mailboxes "Mailing-letters is clearly not a cross-cultural phenomenon based solely on body structure, nor a body structure plus a skill all normal human beings acquire. It is an affordance that comes from experience with mail boxes and the acquisition of letter-mailing skills" (Dreyfus 1996, p.2).

Similar to Gibson's affordances, Glenberg considered 'the phenomenological aspects of conceptualization, acknowledging that objects inherently suggest to the human perceiver what kinds of activities one could do with them' (Davis, 2009). Glenberg named these as activity patterns (1997).

Activity patterns develop in two strands, automatically and manually attributed. Automatically attributed activity is a result of innate bodily potentials, our sensory embodied awareness of our environment, which he named 'projectable properties' (ibid.). Manually attributed activity, akin to Barsalou, relies on mental simulation and is goal orientated. Our memory is used to recall 'non-projectable' features of the environment based on previous encounters to seek out the best course of action. Glenberg proposed that this manual, or non-projective property, 'meshes' with projective properties to allow us to conceptualize (ibid.).

This cognitive action of 'meshing' in a search for 'common proprioceptive qualities' (Davis, 2009) informs our Being-in-the-world; if our action of desire, our goal, meshes with the objects automatic potentials then that object is seen in a new way, serving our need.

To process information as quickly as possible, Glenberg (1997) proposed that we subconsciously 'clamp' the simulations. 'Clamping' (ibid.) refers to the process of holding on to only the most relevant perceptual symbols/projective properties relating to the immediate environmental situation allowing almost intuitive action.

However, 'suppression' encourages a more open mind, opening up a simulation to non-projectable properties, symbols and simulators from memory, outside of the immediate environment, questioning the object from different perspectives, looking for ways in which meaning could be found in the abstract.

When we seek to interpret a model in a novel way, as an abstract, conceptual model rather than a copy for example, we 'suppress' the bottom-up, we concentrate, applying a conscious mental simulation in a search for different affordances and meaning.

CONCLUSION

Our perceptual simulation system, our memory, is the selection, discarding and reshaping of the elements of experience to fit our current interest; it is a search for relevance. However, although it is cognitively closely related, it isn't a conjuring up of mental images nor just a regurgitation of memory and associations (El Refaie 2014). In conscious simulations visualization is a very important process. When we concentrate, when temporal aspects of a thing are purposefully mentally simulated, perception becomes 'semiotically inclined' (Davis, 2009). This semiosis enables a shift from mono-modal, as in what we see, to develop into a multi-modal simulation of what we remember through embodied experience.

We perceive materials, forms and images as a combination of multi modal symbols drawing on memory/experience and cultural understanding. Our perception of any given environment is a combined understanding of each and all its parts and each of these parts have their own perceptual symbols drawing on historical and social understanding informing our embodied experience. In mentally proposing simulations we draw on these symbols to create theoretical models to understand, hypothesize or compare. We can mentally manipulate the way in which objects are brought together to create new simulations, to abstract conceptual information metaphorically to seek new perspectives, new experience which inform us through interpretation.

The hypothesis put forward here is that this is the way in which we should approach the choosing and forming of materials in model making in order to make the unperceivable (i.e.: emotive

experience) tangible. The historical links (narratives, object recollection, etc.), metaphors (linguistic or image) and gestures, brought forward in working with participants in research are contextualized and translated in terms of material symbols and form symbols.

The images shown here (Figures 1, 2 and 3) are taken from the initial stages of current research undertaken with brief descriptions provided from the analysis for the model's appearance. The model stems from a method of analysis based on the approach described within this paper, initially an interview, transcribed and thematically analyzed. The results of which were investigated further by both participant and researcher to develop metaphorical links and a visual language. It was important that the visual conceptualization was clear, so that the participant found relevance in the analysis' findings. The researcher initially worked with metaphorical concepts and image schema, used and understood in both text and objects, as the bridge between these languages (See Richardson et al. 2001 for experimental evidence of this, drawing on the earlier work of Scheerer and Lyons 1957 and Kohler 1970).

In translating the understanding of the text into material and form it was accepted that the meaning could not be conveyed as said. Translation is an act of transposing meaning through interpretation, the meaning of the model stems from the cultural and emotive connotations they evoke through the choice of materials, colour and they way in which these are formed, brought together and relate to their environment.



The unbalanced nature of the overall model reflects the participant's feeling that her life is constantly 'thrown' by the disease. However, she combats this through a state of 'perpetual motion' and unbounded energy despite the awareness that it rests on a 'crumbly chalky' foundation, shown here as a cone, the tip being the remaining point of contact to normality but also the peaks of mountains from which she could leap to new life (in reference to the potential of the health professionals of Switzerland providing a solution to her RA). The pin point connection of the base to the 'core' is drawn from the participant's acceptance that the drugs she takes (through injection) 'hold it all together' but also highlight the feelings of balance and fragility

The curved lines of the steel show similarities to diagrammatic dance instructions referencing the participant's analogies to her relationship to RA and her commitment to movement and energy as the antithesis of the disease. The ends of the steel wires are formed into hoops, similar to industrial knitting machines and general fixings with connotations of further attachment, usefulness and potential.



Both the fabric (silk thread) and the steel are integral to the overall structure of the model. The thread's growth stems from the underside of the steel structure, undermining and 'tripping up' the participant.

The thread seems woven or knitted, creative acts referencing the auto-immune understanding that the participant is the creator of her own disease; the irregularity, however, evokes an unknown system, like a microscopic organism colonizing the structure.



The shape of the core is a direct reference to the hip replacement undertaken by the participant which she saw as the core of her physical support, a success allowing for the continuation of her life.

The presentation of the core of the model with eggshell like qualities, a soft sheen, delicate and fragile, white smoothness is counterbalanced with the stretch marks and tears in the material as it is formed and its elasticity begins to tire; incomplete and stretched the suggestion is one of both a decay but also the slow growth of bone structure (hope) forming towards the base of the model.

The research currently being undertaken, from which the images above are taken, is seeking to show that pain, being an embodied experience, becomes open to us through models, if the perceptual cues offered are more than symbols but carry in them meaning of their own. The culturally based, metaphorical framework of materials and form provide the context, the cultural link from subjective expression to generic communication, that diagrammatic symbols can't reference.

Even though the Visual is central to the cultural construction of social life in contemporary Western society (Rose 2007) and cognitive research has shown that the understanding of language is embodied and modally based with spatial connotations (Lakoff and Johnson 1999, Stamenov and Gallese 2002; Richardson et al. 2001), the use of purely linguistic approaches still dominate our perceptions of the world in research. New, more creative approaches are being sort by researchers such as Torres and Galvin (2008) to avoid the use of 'language in summative ways that can over-sterilize or even deaden the aliveness of the shown phenomena' (569). However, the focus here still lies with linguistic approaches, which Root-Bernstein saw as misguided.

“Neither our experience of nature nor our ability to think about it are limited to, or are even mainly confined to verbal forms. Thoughts may, in fact, be translated into language only for

communicating but pictures, music, and other nonverbal forms of thought also communicate and can be manipulated logically” (1985, 62).

The role of models is a communicative one (Glanville 2012). Models, formulated through the methodological path described above where analysis is understood to be “not an experimental science in search of law, but an interpretative one in search of meaning” (Geertz 2002, p.541), can convey the complexity and multiplicity faithful to the phenomena they describe whilst skirting the philosophical and technical constraints linguistic accounts and explanations invoke.

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