

# The Psycho-neurology of Embodiment with Examples from Authentic Movement and Laban Movement Analysis

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**Abstract** There is widespread agreement that thought is embodied cognition and that our earliest learning is implicit, through the body, and nonverbal expression. This article advances the proposition that the integration of thought and emotion is felt through the body. Embodiment and embodied simulation (ES) (Gallese in *Neuropsychanalysis* 13(2):196–200, 2011) represent controversial topics in both the philosophy of mind (Clark in *Being there: Putting brain, body, and world together again*, MIT Press, Cambridge, MA, 1998) and cognitive neuroscience (Gallagher in *Cognitive Syst Res* 34–35:35–43, 2015a; Gallagher in *Conscious Cogn* 36:452–465, 2015b; Gallese & Sinigaglia in *J Conscious Stud* 18(7–8):117–143, 2011a; Gallese in *Philos Trans R Soc B* 369(1644):20130177, 2014). As a result of advances in these areas of research, there is a need to re-conceptualize our understanding of the mechanisms and processes involved in dance movement psychotherapy. Could ES be applied to the psychology of movement? This article attempts to apply this theory of embodiment to the practice of Authentic Movement (AM) and Laban Movement Analysis. The theory of ES is proposed as one possible explanation of how the witness in AM comes to know her inner experience in the presence of a mover, which may lead to an “offering” to that mover from the witness’ conscious body (Adler in *Offering from the conscious body: The discipline of Authentic Movement, Inner Traditions, Rochester, VT*, 2002). Furthermore, there is an examination of how ES connects to the task of movement observation and how meaning is arrived at from the various movement patterns observed.

**Keywords** Authentic Movement · Embodiment · Embodied simulation · Laban Movement Analysis · Psycho-neurology

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## Introduction

The concept of embodiment has received a great deal of attention in recent years. This conceptualization, rather than proposing forms of cognitive involvement with movement, stresses the role of the dynamic body (changing movement) in the agent (the individual), and holds that the attribution of movement meaning is action-based and enactive, incorporating the motor-knowing of the observer and performer.

The term embodiment could be said to refer to the biological and physical presence of our bodies, which are necessary preconditions for subjectivity, emotion, language, thought, and social interaction. The phenomenologist Merleau-Ponty (1962) gave an account of embodiment in which he distinguished between the objective body (the body as a physiological entity) and the phenomenal body referring to my (or your) body as I (or you) experience it. Although there is an experience of our body as a physiological entity, the tendency is to experience our body as a unified potential or capacity for doing things or responding to a need via movement. Motor capacities (expressed as bodily confidence) do not depend on an understanding of the physiological processes involved in performing these actions. Embodiment, therefore, refers to the phenomenal body and to the role it plays in our object-directed experiences. Csordas (1999) speaks of embodiment as an existential condition in which the body is the subjective source of experience. The ground from which it springs is culture and the experience of being-in-the-world.

Varela, Thompson, and Rosch (1991), when speaking on embodiment, refer to an enactive (Thompson, 2007) approach to cognition (a dynamic interaction between an acting organism and its environment) saying that:

... first, cognition depends upon the kinds of experience that come from having a body with various sensorimotor capacities, and second, that these individual sensorimotor capacities are themselves embedded in a more encompassing biological, psychological and cultural context. (pp. 172–173)

Accordingly, in cognitive science it is claimed that intelligent behavior emerges from the interplay between brain, body, and the world, and that this interplay is termed embodied, embedded cognition. Varela et al. (1991) pioneered the view of embodiment in relation to mind whereby cognition rather than being conceived of as a detached re-construction of the world is seen as a suite of dynamic processes enabling embodied activity (Engel, Maye, Kurthen, & Konig, 2013). Action is what enables perception and cognition rather than being in a secondary role to them. One could foresee a third wave of cognitive therapy emerging as a consequence—following behavioral and mindfulness—perhaps to be termed embodied, enactive cognitive therapy. The dynamic nature of the mind (Kelso, 1995; Thelen & Smith, 1994) and the body (which is as plastic as the brain) in action lead to considerations about perception as an embodied activity (Hutto & Myin, 2013). According to Kirchhoff (forthcoming) “affect, cognition and sensorimotor contingencies are inseparable given that patterns of affectivity are part and parcel of perception, action, and cognition (Colombetti, 2013; Gallagher, Hutto, Slaby, & Cole, 2013).”

There are also the related issues of action understanding and mind reading. In the area of philosophy of mind, folk psychology by the observer (Hutto, 2003) refers to the ability to understand others, whereby minds are read by ascribing to them intentions, beliefs, and other mental states (Davies, 2005). In cognitive neuroscience this is the main aspect of Theory–Theory and Rationality–Teleological Theory. According to Gallese and Goldman (1998), we understand others because we have developed a common-sense theory of mind consisting of:

a set of causal/explanatory laws that relate external stimuli to certain inner states (e.g., perceptions), certain inner states (e.g., desires and beliefs) to other inner states (e.g., decisions), and certain inner states (e.g., decisions) to behaviour (see also Stich & Nichols, 1992; Scholl & Leslie, 1999). (p. 496)

Dennett (1987) claims that mentalizing has a set of rational principles underlying it which the mind-reader uses to decide which mental state would be embraced by the others, seen as rational agents. However, more recent research has taken us beyond the cognitive and mind-reading propositions. The era of the dominant cognitive paradigm, and the associated cognitive behavioral therapy aiming to change the patient’s maladaptive conscious cognitions, has passed. The new acknowledgement of the bodily-based emotions and psychobiological states has been welcomed to center stage in both research and clinical practice. Gallagher (2005) has underlined the important role of the body in shaping the mind beyond the brain—including the sensorimotor system, the perceptual system and situatedness (the body’s interaction with the environment)—in challenging Cartesian dualism.

In dance movement psychotherapy (DMP)<sup>1</sup> as far back as Berrol (1992, 2006) an overview of the neurophysiological and neuroscientific connections has been made; Homann (2010) has presented concepts from embodiment and related them to neurobiology. Affective neuroscience (Gallese & Lakoff, 2005) emphasizes the importance of body-originated information for the formation of neural structures. Schore (2012) alerts us to the paradigm shift taking place in psychotherapy where there is an integration of nature and nurture, specifically biology/neurology and psychology. It is the duality of thought and emotion that interpersonal neurobiology does not support (Schore, 2012; Siegel, 2012; van der Kolk, 2014). Instead, all thought is now understood as embodied cognition. Our earliest learning is implicit, through the body, and nonverbal.

The aforementioned cognitive model posits a clear-cut separation between sensory perception and motor processes. However, contemporary studies in the neurosciences provide a new perspective of the mind. The proposal that movement is uninvolved in the coding of sensory information and confined only to execution is no longer valid (Gallese, Fadiga, Fogassi, & Rizzolatti, 1996). Cortical motor areas traditionally believed to possess functions purely related to movement are now known to be actively involved in processing sensory information too (Rizzolatti & Craighero, 2004). Several investigations demonstrated that cortical areas involved

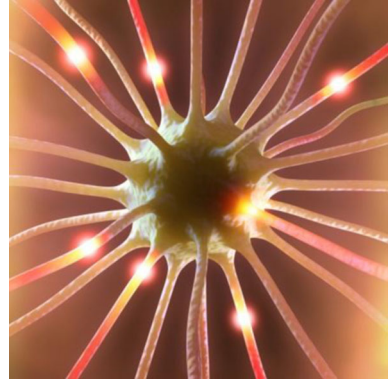
<sup>1</sup> In the UK the professional association (ADMP UK) has adopted the term dance movement psychotherapy (DMP) and is an organizational member of the United Kingdom Council for Psychotherapy (UKCP) therefore this is the term employed throughout this article since it was written in the UK by a UK practitioner.

in the motor control of, for example, a hand grasp, are also activated during the observation of graspable objects, or, in the case of research on mirror neurons (see Fig. 1) during the observation of an action performed by another entity (Gallese et al., 1996; Ferrari, Gallese, Rizzolatti, & Fogassi, 2003; Fogassi et al., 2005). This demonstrates that the behaviors, emotions, and sensations of others are mapped into our internal motor representation, which creates a direct connection between self and others.

Through a mirror mechanism we can simulate in ourselves the same emotional and somatosensory experiences that we observe in others. This direct, interpersonal route of knowledge allows us to resonate in synchrony with others and makes it possible to share dimensions of experience at a nonconscious level, i.e., that of implicit inter-corporeality. The term *nonconscious* found in neuroscience and psychology refers to processes experienced and observed in physical actions and feelings without the involvement of language and symbolic thinking (Rustin, 2013). Established in infancy pre-verbally, Lyons-Ruth (1998) called it implicit relational knowing, however, it may become conscious through bringing attention to the movement and/or feeling (Stern, 2004; Beebe & Lachmann, 2014). The nonconscious is differentiated from Freud's references to the unconscious and to unconscious repressed material. Furthermore, Schore (2003) argues that the nonconscious survival functions of the right brain, rather than the language functions of the left, are dominant in development and psychotherapy, as are the most complex, highest human functions such as empathy, stress regulation, intersubjectivity, compassion, creativity and intuition. Implicit relational knowledge lies in the nonverbal communication right to right brain, underneath words (Schore, 2011). This finding connects to Travarthen's research on intersubjectivity in mother-infant communication (Travarthan, 1977; Travarthen & Aitkin, 2001). Furthermore, it is accepted that change can happen through transforming implicit memories at nonconscious levels (Lyons-Ruth, 1998; Schore, 2011).

Merleau-Ponty (1968) first coined the term "intercorporeity," which is associated with Travarthen's (1977) term intersubjectivity, the space between two people. Atkins defines intercorporeity as "the capacity to understand another person's action through the body prior to, and as a condition for, cognition" (Atkins, 2008, p. 48). Gallagher and Payne (2014) argue that the contribution of embodiment to cognition, and therefore, clinical reasoning, is inescapable.

This discourse revolves around research on the role of emotions in development, psychopathology, and psychotherapeutic processes, and the importance of body-felt affective processes in human experience (Gainotti, 2012; Schore, 2012). Damasio (2003) offered a helpful division between emotions as observable body states, and feelings as mental events noticed only by the one experiencing them. He argued that "emoting" begins with an emotionally competent stimulus (e.g., an attractive or scary person). The organism automatically appraises the stimulant as conducive or not to survival or wellbeing. As a result, a complex range of physiological reactions are mapped onto the brain such as a faster heartbeat, tension of facial muscles, etc., from which a feeling arises. Feelings, he claimed, corroborate the state of life deep within and are a guide to decision-making.

**Fig. 1** A mirror neuron

In contrast, Stern (2010) proposed that vitality, first conceptualized in his work with mother-infant nonverbal communication (Stern, 1985), and grounded in the body, is the life force exhibited by all living organisms. His research demonstrates that it is possible to trace vitality to real physical and mental operations including movement, time, perception of force, and the spatial aspects of the movement and its underlying intention. He shows us that the multimodality of sensorimotor experience is a cornerstone for the emergence of a vitality form. He explains that forms of vitality characterize personal feelings as well as dynamics of movement. Thus, these forms are related to feelings of agency and self-efficacy, and may be shaped and influenced by the early interactions between caregivers and infants.

The origin of these vital feelings takes place within the infant's psychobiological rhythms of the body, which arise from relationships with others, particularly with the mother. The early mother–infant interaction can be considered a bio-behavioral system that is regulated in the brain through complex neurochemical systems and circuits involved in reward and motivation.

Maternal attunement is “a partial and ‘purposely’ selective kind of imitation” (Stern, 2010, p. 113) supporting a correspondence of the infant's vitality form. The difference between attunement (Kestenberg, 1995; Keysers, 2011) and imitation is that in the former mothers match and focus the dynamic features of their infant's inner state. Markova and Legerstee (2006) found that maternal attunement leads to more infant gazing, smiles, and positive vocalizations towards the mother when compared with maternal imitation. In DMT it is the therapist's capacity for intentional attunement communicated to clients through her bodymind which supports the therapeutic alliance. By this emphasis on the primary role of movement in creating forms of vitality, it is clear that the physical aspects and mechanics of movement in time are the building blocks for the creation of a mind that is shaped to capture the dynamics of forces and sensations linked to movement, whether self-generated or produced by others.

The experience of vitality is expressed in movement by considering time, space, force, and intention. Interpreting the intentionality of movement, rather than simply the individual movements themselves, is advantageous because it allows the observer to filter out all the irrelevant observed movements. While interacting with

someone, the observer attends to a very limited set of stimuli and only those expressing intentionality are relevant (Stern, 2010).

## Embodied Simulation

The concept of embodied simulation (ES) goes beyond the reading of bodies and minds; it involves the psychology of movement. Proposed by Gallese (2011), this concept is explored below as inherent to the practice of DMP. It is particularly relevant to the discipline of Authentic Movement (AM) and Laban Movement Analysis (LMA) because of the inter-relationship between the mover/movement behavior and the witness/Laban movement observer respectively. The concept applied here results in the witness/observer engaging with actions and emotions internally, rather than acted on, during their respective tasks. Thus the processes underlying interpretations of movement actions in others in both AM and LMA can be explained by embodied simulation.

Simulation theory states that one way to make sense of another's behaviors and beliefs is when an agent ascribes to them mental states by simulating them internally in his/her cognitive system (Gordon, 2009; Gallese & Goldman, 1998; Currie & Ravenscroft, 2002) in a form of re-cognition. Embodied Simulation, according to Gallese and Sinigaglia (2011a), is a unitary description of the fundamental features of intersubjectivity. The authors demonstrate that people recycle mental states/processes represented in a bodily format, expressed as functionality, which they then attribute to others. We experience others as having experiences similar to ours. Making sense of others' alive and dynamic bodies is rooted in the power of re-using our own motor, somatosensory and visceromotor resources (Gallese & Ebisch, 2013) facilitated by mirror neurons (Berrol, 2006; Gallese & Sinigaglia, 2011b). This is similar in the field of social cognition to mentalization—the process by which we are attentive to, and make sense of (implicitly or explicitly) others and ourselves in terms of subjective states and mental processes (for example interpreting needs, goals, reasons, desires, feelings, beliefs, intentions). The related area of Theory of Mind, in which it is assumed that others have minds by analogy with one's own mind, also refers to the ability to attribute/infer these mental states to oneself and others and to understand perspectives that are different from our own. This attunement, or “tuning into” others, a capacity which develops in the first five years of life, is intuitive, allows us to predict and interpret another's actions by evaluating their intention/motive, thoughts, feelings, or desires, and is linked to our capacity to empathize with others.

Embodied simulation has been debated in the study of intersubjectivity, whereby social cognition can be defined as understanding another's sensations and emotions without any kind of folk psychology (Gallese, 2001, 2005) required. This position has been interpreted as a low-level form of mental simulation (Goldman, 2006) based on the “unmediated—below the threshold of consciousness—processes underlying mirror-neuronal activity” (Gallese & Lakoff, 2005, p. 5). This is in contrast to a high level one, associated with the attribution of complex mental states

(e.g., propositional attitudes), “accessible to consciousness” (Goldman, 2006, p. 147).

Mirror neurons discovered in the premotor cortex of rhesus monkeys were shown to be involved in action understanding (Rizzolatti, Fadiga, Gallese, & Fogassi, 1996). Single-electrode recording revealed that these neurons fired when a monkey performed an action and when the monkey viewed another agent carrying out the same task. Studies with human participants have shown the brain regions containing mirror neurons are active when one person sees another person’s goal-directed action suggesting that mirror neurons may provide the basis for theory of mind, and to support simulation theory of mind reading (Haroush & Williams, 2015). Essentially the point is that mirror neurons and associated neuroscience studies show that witnessing the actions of others rather than being simply a visual exercise, is one that co-involves our own actions and emotions. Consequently, our motor and affective systems, which are inevitably shaped by our history of personal actions and emotions, will always infiltrate our perception of the emotions and actions of others, and thus be intrinsically subjective. Similar processes take place when dance movement psychotherapists implement the group model termed Chacian circles (often with music) (Chaiklin, 1975), which utilizes a mirroring method. Participants in the circle are invited to copy the group therapist’s movements and to synchronize with others’ movement so that all move to the same rhythm at the same time and with similar movements (termed entrainment in music). In this approach the therapist leads the group by attuning to the group, picking up on, and mirroring back to the group individual participant’s divergent movements which reflect emotional aspects being expressed in the group movement. This method enhances and amplifies communication in different nonverbal ways. Mirroring by the Chacian group therapist is a body-felt response to the group’s non-verbal expression, a way of incorporating movements spontaneously performed by participants. The therapist is bodily engaged in the active, expressive movement dialogue and expression; she is relating non-verbally to participants and nurturing a sense of belonging by incorporating members’ movements (whether they are conscious of this or not) to form a cohesive group process. Research has demonstrated that this synchronous group process of dancing together to music can reduce pain and increase social bonding (Stone et al., 2015). The therapist’s reflection-in-action (Schön, 1983) of physically mirroring movements in Chacian circles makes it different from the AM and movement observation examples. In these the witness and observer respectively are not engaged physically (reflecting-on-action), and are instead receptive to the movement yet outside the action. However, the same processes of ES may also be at work in Chacian circles.

## Authentic Movement

The discipline of AM is another DMP approach, which employs two fundamental roles those of the witness and the mover (Whitehouse, 1979; Chodorow, 1992; Adler, 2002; Payne, 2006). A period of time is agreed for the process and eye contact between the witness and mover is made. The witness (usually sitting) does



not move and remains with eyes open. Her role is to attend carefully and benignly to her mover, regarding her nonjudgmentally whether she moves or remains still. The mover, with eyes closed, waits for a stimulus for action. She may move in response to her imagination, a sensation, or an environmental source; or she may express a feeling, a thought, story or symbol, etc. She is free to express for the duration of the agreed period of time in the presence of her witness. A transition time may then ensue whereby drawing, writing, or contemplation take place before the mover speaks of her experience and names any movement she can recall. Then she may invite witnessing of the movements at which point the witness speaks of her experience in the present tense and only where it connects to the movements named by the mover. They meet in languaging their experience of the moment of the movement named by the mover. There may be a unity of experience, such as in one significant moment they both speak of the same creature and understand its intentions (for example, a panther prowling across the land marking its territory). In this case the mover will be clearly seen by her witness. Another time there might be a divergence in perception: What was experienced by the mover was not seen in a similar way by the witness.

When applying the ES conceptual framework to the reception of movement, as in witnessing experiences, it is suggested that there could be a representational equivalence between the perception of a given movement behavior and its neural simulation. In potentially shaping the degree of the agent's practical knowledge of movement, ES offers an explanation of the way a witness meaningfully understands the movement she sees. Moreover, ES refers to a basic form of (action) understanding, which regulates pre-conceptual responses to the movement stimulus according to the witness' motor expertise, providing her with a different, intrinsically motoric, modality of movement understanding. This would suggest that the AM witness, in the presence of a mover, accesses her own imagination, sensations, interpretations, intentions, and emotional feedback in an "as if" (Damasio, 2003) scenario, i.e., as if she were actually performing the movements herself.

At the beginning of the causal process, the brain's emotion is triggered by detecting a simulation mechanism, which is done by the individual's belief or imagination creating the movement (in the example of AM, this would be the mover). Then the intermodal connection between emotion and bodily movements is utilized in the "witness," leading to the mirroring of these movements from a first-person perspective, and eliciting a simulation of emotions in the witness. It is action-empathy and is interpersonal since the witness has no access to the mover's mind.

When taking the practice of AM as illustrative, it is proposed that the notion of ES may be conceptualized, therefore, as the method by which a witness might make sense of the movement expressed by the mover. The mover, expresser or actor is the one who spontaneously moves with eyes closed in response to an impulse whilst in the presence of a witness. This witness remains still yet attentive to the mover, and to their own experience in the presence of their mover, whether imaginatively, through body sensations, emotionally, kinesthetically, cognitively, etc. Such meaning-making ability allows the witness to infer, for example, the intentions



behind the movement material being witnessed in the dynamic movement interaction. In the case of the witness being in the role of the therapist, with an in-depth knowledge of the psychopathology and history of the client/mover, it would be treating the movement as a form of interpersonal (involving the transference relationship) interpretation. Connections made by the therapist with the client's personal history, life events and current conflicts might also contribute to the therapist's interpretation.

Neuroscientific research indicates that neural mechanisms mediate between personal, experiential knowledge held about our lived body and the implicit knowing held about others. Our body-held experiential knowledge, or body memory (Fuchs, 2003), facilitates an intentional attunement with others, co-creating a mutual intersubjectivity. Through this "we-centric" environment we characterize and bring experiential understanding to the actions, emotions, and sensations of others. This body-felt, experiential understanding is achieved by modeling another's behavior as intentional experience on the basis that there is a correspondence between what the other does, senses, imagines, and feels, and what we do, sense, imagine and feel. Consequently, it can be said that the therapist (or the person in the role of witness) is connecting with their client/mover through ES with the mirror neuron system a likely neural correlate of this process.

[The mirror mechanism], given the present state of knowledge, maps the sensory representation of the action, emotion or sensation of another onto the perceiver's own motor, visceromotor or somatosensory representation of that action, emotion or sensation. This mapping enables one to perceive the action, emotion or sensation of another as if she were performing that action or experiencing that emotion or sensation herself. (Gallese & Sinigaglia, 2011b, p. 2)

In AM group work, when a witness sees a mover creating movement, making/receiving physical contact with/from another or to herself (tactile empathy activated through her somatosensory cortex), or hears the sounds of the mover (auditory empathy) she resonates with these, while in stillness herself, interpreting the movement/touch/sound through ES. Later, if requested by her mover on her return from the moving experience, she can speak about her experience of these moments of resonance with her mover. The witness speaks about her experience in the present tense, thereby enlivening those same pathways, to give clear, empathic, and potentially profound witnessing. Optimally, the mover will feel clearly seen by the witness who verbalizes her experience of their meeting in the mover's movement, touch, or sound-making.

The importance of the relative immobility of the witness has been demonstrated to be crucial to this process. Gallese (2017) indicates that it is this relative inactivity (calling it the "neotenic look" as found in infancy) which enables the emotional responses to the action to be felt in more depth (for example, when watching a film that touches us emotionally).

Our being still simultaneously enables us to fully deploy our simulative resources at the service of the immersive relationship with the fictional world,

thus generating an even greater feeling of body. Being forced to inaction, we are more open to feelings and emotions. The specific and particularly moving experience generated when immersed in fictional worlds is thus likely also driven by this sense of safe intimacy with a world we not only imagine, but also literally embody. (Gallese, 2017, p. 325)

If the witness is craning to *see* a mover, fidgeting, or turning to other distractions, she is violating the requirement for her to absorb fully the impact of the mover's action on her body-mind. Stillness in this context can be understood as a form of meditation in which the whole body-mind is open and receptive to whatever comes its way from the mover and the environment in which she moves. The witness aims to attend to (or regard) the mover, while, at the same time, noticing the inner experiences in her lived body in the mover's presence.

We share various states with others including emotions, actions and sensations, and these bind us in shared identity providing a sense of belonging and community. Intersubjectivity enables us to conceptualize that we recognize others as similar to ourselves in making communication and ascribing possible intentionality. Through the practice of such disciplines as AM, deep empathy and compassion can be experienced. Through ES, our most fundamental *beingness* can be experienced again and again as we are *seen* and we *see* others clearly.

An example from AM:

I am a witness to a mover. I see this mover begin by walking from one pillar to another as though checking the boundaries around the space. I see her enter the middle of the space and spread into it, using all there is available. She expands her body on the floor and now raises up and travels around and around in circles. I feel dizzy; she stops. I do not feel dizzy anymore. I get a sense of restlessness in my mover, no place feels quite right to settle in. I see her flick away, with her fingers, bits she finds on the floor, the unwanted debris from life. I see her open her arms as she runs around the space, I see play, laughter, and smiles across her face and I hear her voice. I feel joy, expansion, release of baggage, I feel light and airy. I have space all around me to be who I am without judgement. Am I seen? I am a plane turning its wings skyward, side to side, held by the air, the energy diminishes, her arms come down and I hear her breath. There is more to come, but time is up.

## Laban Movement Analysis

Laban Movement Analysis (LMA) (Laban, 1980) is a tool that dance movement psychotherapists sometimes use to assess clients' movement profiles. The attribution of meaning to movement has been claimed by many including Laban and Lawrence (1974), and others employing the theory: Dell (1977), Ramsden (2004), Lamb and Watson (1979), Moore (1988), Moore and Kaoru (1988), Newlove and Dalby (2005), Bloom (2005), and Davies (2005). Numerous body-language authors and researchers in the field of nonverbal communication and psychology have advanced similar claims. In the holistic/complementary health fields there are

claims that diagnosis/meaning-making of issues with internal organs etc. can be conducted and healed through the stimulation of areas in other body parts, for example, in reflexology the hands or feet (see Fig. 2).

Laban Movement Analysis in particular has led the DMP field with reference to the assessment and diagnosis of, for example, personality, as in North (1972), and various mental disorders, such as schizophrenia (Higgins, 2004), irritable bowel disease, and eating disorders (Lausberg, von Wietersheim, & Feiereis, 1996). Such authors illustrate how the Laban system can be utilized as an assessment methodology for session planning with a range of populations. This paper disputes the so-called objectivity of this observation, description, and meaning-making of movement behavior.

When movement analysts observe and ascribe meaning to movement by using LMA categories, they are doing more than applying a cognitive understanding of those categories. Fitting what they observe into the categories (Kestenberg-Amighi, Loman, Lewis, & Sossin, 1999)—is achieved in part through the analyst's ES, which involves neither mental nor cognitive states. The acts mirrored in ES are goal-directed acts within the motor repertoire of the perceiving subject, or the movement observer in this example. The resemblance on which ES relies here is intrapersonal, as the perceiving subject does not have direct access to the other's mental states. Only the outward behavior is observed, and from that exterior perspective, analysts assign their own meaning and categorize the movement.

This action-simulation mechanism, embodied in mirror neurons, is consistent with the idea that a subject can re-enact her own motor experience through an automatic, involuntary process in order to give sense with her own body to a movement seen. Dance movement psychotherapists and certified Laban movement analysts train their bodies in LMA's various effort combinations and shape elements in order more readily to recognize these patterns of postures and gestures in mover behavior (Bartenieff & Lewis, 1980/2002). It could be inferred that the development of the capacity to dance in the performer's motor system leads to a vocabulary of motor actions that can be employed to simulate the actions, emotions, and the intentions evoked by movement patterns expressed by another. It is this which enables an intentional meaning to be ascribed to a movement expression observed.

**Fig. 2** Reflexology left hand chart



Most dance movement psychotherapists are bodily intelligent, having trained for many years in one or more forms of dance and/or movement practice, in Laban movement, including all the elements of Body, Effort, Shape and Space, and in movement observation and analysis. It follows that as therapists employing LMA they would be able to see and interpret a wide range of movement repertoire.

On the other hand, aspects of movement can also be interpreted by people without similar training, and by those who do not have in their motor repertoire any particular sequence of acts. These untutored observers become “thought-dancers” in that they do not know, in their bones as it were, how to dance/move the particular movements they are observing. Despite the lack of specific training, they will have experienced a range of feeling-states and associated movement patterns throughout life. Hence, anyone can become a witness or interpret another’s movement patterns at a particular level, and may, for example, feel empathic towards a mover and “read”, or ascribe meaning to body movement.

Empathy involves the recognition of another’s emotions by noticing their expressive behavior (Prinz, 2004). The observer’s recognition of this movement behavior triggers emotion, thereby prompting simulation mechanisms regarding the intention, belief or imagination of the agency (the expresser) generating the movement. The intermodal connection between feeling and bodily movements is promoted resulting in the internal mirroring of these expressive movements from a first-person perspective, which elicits in the observer a simulation of emotions being felt by the expresser. This can unify the observer’s sense-making abilities, where memory, imagination, and sensation can be integrated in a motor-grounded framework. However, this view relies on an autonomous domain to simulate emotions, which, according to Gallese (2005, 2011), is not necessary, and is prone to circularity in the context of embodied approaches to sense-making where imagination is conceived of as an example of ES.

The body is the vehicle for emotional expression and the feedback from the body when interacting with the environment affords bodily resonance (sensations, posture, gesture or a “readiness” for movement) (Husserl, 1952; Merleau-Ponty, 1962), and leads to emotional perception. Thus inter-affectivity, or embodied inter-affectivity (Fuchs & Koch, 2014), and intercorporeality are intertwined in and through our bodies. That is, I am affected by your emotional expression since I experience my response to it through my body’s sensation and kinesthesia. Furthermore, at the same time I am also affecting your bodily resonance, creating a mutuality of intersubjective affectivity. Emotions are brought about by this inter-bodily conversation within the embodied appraisal (Prinz, 2004) and cognitive appreciation of the situation, which may subsequently be modified by any relevant body memory, as examined by Fuchs (2012). Consequently, any interpretation will be a subjective, embodied response rather than an objective stance towards the one observed. Movement observation and analysis, similar to any observation and subsequent interpretation of behavior/actions, is a subjective process.

## Conclusion

An observer of another's movement, such as a certified Laban movement analyst, will bring to the observation process all factors discussed above, which, in turn, affect the analyst's observation (depending on the resonance through ES), and subsequently their interpretation of the observed movement patterns. It can therefore be established that when we consider the concept of ES in a movement observation context or in the discipline of Authentic Movement practice, it appears to serve as a fitting model for identifying the multifaceted affinity between an agent, (whether observer or witness), and the mover. In the examples of Authentic Movement and Laban movement observation/analysis, it can be concluded that the witness and the movement observer respectively bring to that experience (and interpretation) their own neuronal pathways imbued with personal history including emotional and motoric experiences. Thus, these are entirely subjective processes rather than visual exercises in the objective sense. The processes underpinning such pivotal approaches as Chacian circles, AM, and movement observation can benefit from the research into ES, and interpersonal neurobiology more broadly, including the concepts of attunement, embodied inter-affectivity, and intersubjectivity.

### Compliance with Ethical Standards

**Conflict of interest** The author declares that there is no conflict of interest.

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