



Tactile Hypersensitivity and “Overwhelming Subjectivity” in the Touch Experience of People With Congenital Deafblindness: Implications for a Touch-Based Pedagogy

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Tactile hypersensitivity, sometimes referred to as tactile aversion, shyness or defensiveness, is a frequently cited challenge for support partners and educators in working with people with congenital deafblindness (CDB). Touch is the most fundamental of the sensory modalities, rivaling other modalities in complexity and an essential building block of emotional, psychological, social, and intellectual development. Though touch hyper-sensitivity can be a significant barrier to such development, tactual sensitivity can be a resource as touch becomes more motivating and accessible for the person with CDB. This article introduces the notion of “overwhelming subjectivity” in the tactual perception of people with CDB and touch hypersensitivity, with a starting point in Katz’s conceptualization of the psychophysiological bipolarity of touch in his pioneering work of 1925 (2016). Though the dual subjective–objective nature of touch has been described by others, Katz’s description is one of the neuro-psychological interface of touch perception at the lowest levels of awareness. This article links Katz’s phenomenology to that of Merleau-Ponty (1968, 2012) to provide a new way of imagining touch hypersensitivity in CDB, and briefly relates this to practical approaches already familiar to support partners. Helping to overcome the deprivation and isolation caused by the overwhelming activation of tactual subjectivity that occurs in touch hyper-sensitivity is an important goal for the partners of people with CDB. The notion of overwhelming subjectivity offers a provocative and novel way of recasting an old and often apparently intractable barrier in CDB that can be useful in thinking about and working with it in the support of people with CDB and other forms of multiple disability and touch hyper-sensitivity.

Keywords: congenital deaf-blindness, touch, tactile hypersensitivity, phenomenology, tactual perception

INTRODUCTION

In their review of research on interpersonal touch,¹ Gallace and Spence (2010) point out that, although there is some work on the neurological and physiological aspects of touch experience, the “cognitive” aspects appear to have been totally neglected, such as the characteristics of touch that make it interpersonal, pleasant or unpleasant. Descriptions of touch as having a dual objective–subjective nature have framed this duality in terms of higher levels of sensory-cognitive processing, at which touch acquires emotional and psychological meaning for the perceiver.

Tactual experience is rapidly incorporated into and elaborated at the levels of subjective psycho-emotional awareness (Gallace and Spence, 2010), and there is need for more study of the nature of tactile consciousness (Gallace and Spence, 2008). Although these authors atomize tactile consciousness in defining it as a property of neural representation (2008), their treatment of touch as tool nevertheless positions it as a phenomenon of reflective “higher” cognition. This article attempts to provide a way of conceptualizing touch hypersensitivity in CDB in phenomenological terms that acknowledges the neurological perspective of “touch parts,” the psychophysiological work on tactual perception of Katz (2016), and the embodied phenomenological perspectives on perception of Merleau-Ponty (1968, 2012).

Many people with CDB have problems with systemic regulation and hypersensitivity, and among the most debilitating is touch hypersensitivity often referred to as tactile defensiveness (Walker and Kershman, 1981; Scardina, 1986; Royeen and Lane, 1991; Hartshorne et al., 2010; Spies and Van Rensburg, 2012). In the absence of functional vision and hearing, and often in the presence of multiple disability, touch hypersensitivity negatively affects all aspects of life in the world, from routine physical activity to identity development and relationships (Smirni et al., 2019). When touch is unpleasant, distressing, or painful, opportunities for developing tactual cognitive skills and tactual agency will be significantly reduced (McInnes and Treffry, 1982; Royeen and Lane, 1991; McClinden et al., 2020). The notion of touch hypersensitivity as an “overwhelming subjectivity,” experienced neurologically and in terms of psycho-emotional and social meaning, offers a new “take” on this familiar problem that can inspire new ways of thinking about teaching and supporting the people with CDB who live with it.

Congenital Deafblindness

Deafblindness is a rare condition with multiple causes, with an estimated prevalence worldwide among people aged 60 years or younger at the 0.1% level (Dammeyer, 2015). Congenital deafblindness (CDB) is extremely rare at 1 in 27,000 births and has over 30 identifiable causes (Møller, 2003; Dammeyer, 2010). It is likely however, that prevalence of both acquired

deafblindness and CDB is underestimated (Dammeyer, 2010, 2015). Deafblindness can be defined either in terms of legal and medical definitions of sensory impairment, or as a functional definition located within the disability focus, describing the functional consequences rather than mere presence of serious combined sensory loss (Ask Larsen and Damen, 2014). According to the Nordic definition adopted in this article, deafblindness is a combined visual and auditory loss or absence of such magnitude that function across three key areas is profoundly impacted: communication, access to information, and mobility, or freedom of movement (Danermark and Møller, 2008). To fulfill a definition of deaf-blindness, function in these three areas must be reduced to such an extent that autonomous participation in the physical and social world is seriously inhibited. Deafblindness can be either acquired (usually defined as occurring after normal language development typically begins), or congenital, present at birth or before the age of language development (Dammeyer, 2014). There is significant debate, however, surrounding the definition of CDB regarding age of onset and the distinction between CDB and acquired deafblindness, especially as deafblindness is often a result of congenital diagnoses such as CHARGE, or Usher syndrome (Ask Larsen and Damen, 2014; Dammeyer, 2014). Definitions of CDB as serious combined visual and auditory loss or absence regardless of cause present in early life before the development of language cite age cut-offs ranging from birth, within 3–6 months, and before the age of 12 months (Rødbroe and Janssen, 2008).

There are few persons with CDB who have complete deafblindness (Rødbroe and Janssen, 2008; Dammeyer, 2014). There may be complete blindness with seriously reduced hearing function, complete deafness with reduced visual function, a combination of reduced visual and auditory functions, or the absence of both vision and hearing (Dammeyer, 2014). Another increasingly common occurrence is the presence of normal ocular structure and function, and/or a normal structural and neurologically functional auditory system coupled with an inability or reduced capacity to interpret visual and/or auditory information in a functional manner (cerebral visual impairment and cerebral auditory processing disorder). Despite the broad and complex varieties of presentation making people with CDB more unique than similar, a cardinal feature is dependence on the tactile sense as the most intact sensory mode.

Congenital Deafblindness involves vulnerability to deprivation-related issues complicated by conditions of reduced function, and the presence of other multiple disabilities is increasingly the norm in cases of CDB (Rødbroe and Janssen, 2008). Causes include increased survival through improved medical treatment in cases of prematurity and birth complications, rare and complex syndromes, and traumatic neurological events. The causes of CDB and multiple disability bring with them general systemic difficulties with neurological regulation such as hypersensitivity to touch, often causing complex behavioral and psychological issues (Geenans, 1999; Graham et al., 2005; Thelin and Swanson, 2006). There is a broad range in levels of developmental function among people with CDB, from those with little or no cultural language and in need of 1:1, 24-h care, to those who have some formal linguistic

¹In this article, I use the terms tactile (that which is accessible to touch), touch (tactual experience as phenomenological, implicating an embodied subjective, experiencing perceiver), and tactual (the physio-psychological perspective). This mixture of terms underscores a central aim of this article, to link neurocognitive, psycho-physiological, and phenomenological perspectives in this treatment of touch hypersensitivity and CDB.

ability (spoken and/or sign language) and more independent function at varying levels across main developmental indices. The communication of people with CDB tends to be complex and atypical, and some form of tactile language practice using conventional signs, gestures and self-made sign expressions is a core communicative mode. For most people with CDB, sign language in the tactile modality will be the main or only mode of expressive cultural linguistic communication, which makes the hands the most important means of communication (Miles, 2003; Møller, 2003; Dammeyer et al., 2015).

Prolonged and frequent treatment in hospitals, often from birth (as with most children with CHARGE) can significantly complicate ordinary attachment and bonding processes as well as sensory integration (SI; Ayres, 1972; Hartshorne et al., 2010). Sensory integration is a challenge for all people with complex neuro-physiological conditions, but when serious combined sensory loss in CDB caused by rare or unknown conditions is added, the situation becomes one of such severe developmental consequences that people with CDB can be said to represent an exemplary case for professionals within special education and multiple disability. There is a great deal to be learned from people with CDB that can and should be applied in pedagogical and support work with people who have multiple disability and complex communication.

The Tactile Sense and Touch Hypersensitivity

The infant has tactile experiences from the beginning of life in its mother's womb, and the tactile sense remains until death even as other sense modalities fade (McClinden et al., 2020). Communication with others is thus primarily through touch long before conventional speech appears. The connection between touch and emotional experience is enormously significant, as touch appears to form, intensify and qualify the latter, and has the power to profoundly influence attachment to and relationships with others, those close to us and strangers alike (Gallace and Spence, 2010). Many studies of the effects of tactile stimulation between coupled partners indicate that touch appears to play a key role in interpersonal communication, intimacy and bonding, and the cognitive processes involved are at low stages of cognitive information processing (Gallace and Spence, 2010).

There are many and complex causes of touch hypersensitivity, including neurological dysfunction or damage, illness or trauma, and environmental, psychological, and social causes; the touch sense in general is extraordinarily complex and sensitive, and touch hypersensitivity can be defined as a heightened sensory response to tactual force stimuli (Lumpkin et al., 2010). The cell biology of touch has been conceptualized in terms of specialized cellular responses to a "barrage" of impressions such as pressure, stretch, flow and sound waves, and many types of cellular receptors have evolved to respond to these impressions with great sensitivity, selectivity, and speed of response (Chalfie, 2009; Lumpkin et al., 2010). Hypersensitivity to touch is common for people within groups of neurodevelopmental disability such as autism (where it has perhaps been most studied), and has been found linked to increases in gray matter in the auditory network that may be connected to social deficits in this group (Watanabe

and Rees, 2016). A significant cause of social touch avoidance in people with autism may be hypersensitivity of peripheral neurons (Schlaffler et al., 2019).

One reason touch is important for psychosocial development is that it triggers the release of oxytocin, a hormone that promotes attachment and bonding, feelings of safety and wellbeing, and works in concert with other hormones, including vasopressin in the regulation of arousal (Taylor, 2014). These two hormones are related to the "emotional window of tolerance" for touch, with oxytocin promoting a "safe state of parasympathetic arousal," and vasopressin a state of "safe emergency" (p. 216). These hormonal interactions in neurotypical touch experience support resilience of and motivation for the use of touch. Given the importance of this interaction, it may be the case that hypersensitivity to touch of many people with CDB, particularly in cases of touch deprivation, is related to lowered production of oxytocin which leaves vasopressin unmodified. It may be the case that in such a state, touch stimulation can be experienced by the person with CDB in terms of a pervasive perception of "unsafe emergency." Pharmacological treatment to restore hormonal balance has been found to reduce negative states such as fear, and to produce feelings of positive self-awareness, including self-confidence and connectedness to the environment (Mithoefer et al., 2013).

Another hypothesis along the same lines is described by McClinden et al. (2020) with reference to the work of Goold and Hummell (1993). There are two central systems for processing sensory impressions received by neuroreceptors of the skin and sent on to the brain: Dorsal Column-Medial Lemniscal System (DCMLS), and the Anterolateral System (ALS). The DCMLS is involved in the manipulation of objects and the discerning of their tactile qualities, as well as perception of proprioceptive information allowing for rapid adjustments of actions during object manipulation through localization of the object and of the position of the hands in relation to one another. The ALS is more primitive, mediating pain and relaying general tactile information such as temperature. The ALS is theorized to be linked to touch hypersensitivity through the limbic system and emotional response, and the hypothalamus in autonomic regulation (Goold and Hummell, 1993 in McClinden et al., 2020). Damage to one system may produce dominance of the other, and the ALS (protective) system appears more resilient than the DCMLS (discriminatory) system. Thus, dominance of the ALS may trigger protective responses to touch experience that produce withdrawal from and avoidance of such experience, resulting ultimately in lack of development of discriminatory touch (Goold and Hummell, 1993 in McClinden et al., 2020).

There is, of course, a spectrum of touch sensitivity on which different individuals will be located, just as there is a spectrum of dependence on the tactile sense among people with CDB, as people with CDB are more unique than they are similar. Hypersensitivity to tactile stimuli in one set of circumstances may be replaced by *hypo*-tactual sensitivity in others, for example, and sensitivity can vary across environmental conditions and situational contexts, from day-to-day, and even from hour-to-hour. In practice arenas of support for people with CDB however, touch hypersensitivity and aversion remain common and significant barriers to learning and social development, inhibiting and often dominating the relationship of the person

to surfaces, things, people and activities in the outside world. It restricts access to context, to communication (including tactile signing and therefore excludes or severely inhibits cultural language practice), exploration, learning opportunities, participation, and most importantly, to the development of relationships and social interaction with other people. In other words, for many individuals, it is a significant barrier to quality of life on a par with CDB itself.

For the purposes of this article, the person with CDB and touch hypersensitivity is someone with little cultural language who requires 1-1 care, located at the higher end of the hypersensitivity spectrum, and likely to have multiple disability. These features are common in CDB, and simplification will make the concept of overwhelming subjectivity in touch hypersensitivity and ways of working with it more accessible. For similar reasons, tactual experience and touch are described here primarily with reference to the hands. Though the touch sense can by no means be reduced to the hand and fingers (especially with reference to people with CDB), there are important reasons for this choice. The hand is the part of the body that is most sensitive in distinguishing fine tactile qualities, and most suited to tactual form recognition. It provides a highly refined point of tactual focus while also affording scanning as well as multiple points of focus held simultaneously between two hands and/or individual fingers during exploration. It is an integral aspect in and often the central means of most human activity, including exploration of surfaces, objects, and occupants of the environment. Use of the hands provides a central means of identifying and assessing aspects of cognition in CDB such as working memory (Nicholas et al., 2019). The hand provides the person with CDB the primary and often only source of access to cultural signed languages, and its specialized sensitivity and the diversity with which it can be used expressively make it analogous to the vocal voice in communication.

TOUCH HYPER-SENSITIVITY AS “OVERWHELMING SUBJECTIVITY”

David Katz and the World of Touch (1925)

Though Katz did not identify himself as a phenomenologist (Kreuger, 1982), his work describes a phenomenology of touch at the intersection of the “touch organ,” the hand,² and the surface of the touchable world. In his ground-breaking work, *The World of Touch*, Katz focuses on how perception of tactile “microstructure” precedes perception of form, or macrostructure. In this he distinguishes himself from both the physiologists with their focus on cataloging neuroreceptors of the skin, and the Gestaltists, with their privileging of form recognition in perception. For Katz, form recognition is developed through tactual exploration of the surface microstructure of objects and

²The tactual perceptual apparatus cannot be restricted to the hand, and indeed, the touch organ is the skin and the musculoskeletal, kinaesthetic, and proprioceptive systems (the whole body, including the brain). However, Katz is concerned with comparing the hand as a unitary sense organ analogous in complexity to the eye to oppose the traditional view of the touch sense as vastly inferior to vision and hearing.

physical aspects of the world, and the touch sense continues to support visual recognition though the latter rapidly becomes and remains dominant from early perceptual development on. For Katz, it is the hand itself, not the minute neuroreceptors of the skin that should be regarded as the organ of touch, comparable to the eye. Katz found, for example, that touch recognition is better with five fingers than with one, that subjects performed equally well in distinguishing texture using both or only one hand, and that spreading the fingers apart and running them over a discontinuous surface is comparable to the action of the receptors in the eye in filling in gaps or blind spots to produce a continuous perceptual field.

In his introduction to Katz (2016) Kreuger points out the similarities between Gibson (1966) and Katz. Both were concerned with how tactile features are registered and verified by the perceiver, and both emphasize the role of movement in object and higher-order tactual perception (both rejected the notion of perception as the passive receipt of sensory information). Both point out that tactual information is obtained through movement rather than imposed by mere contact with an object. Katz goes beyond the notion of gathering information in maintaining that the exploratory perceiver *creates* tactile information through moving touch. Gibson speaks of “wielding” objects in different ways (shaking, waving) and how this produces a constant impression, filtering out proprioceptive information to expose “pure” information about the object. In this way, the permanent properties of an object are distinguished and isolated from “the flux of subjective sensations to which the ordinary perceiver pays no attention” (Katz, 2016, p. 3). Touch is the only sense that (always) requires overt externally directed movement by the toucher or applied to the one being touched to arise and to be maintained. In touch, Katz maintains, it is lack of movement that is most “damaging” to tactual perception; movement is to touch as light is to vision. However, when we feel an object “movement, time and space leave no trace of themselves . . . the object perception is precipitated as an independent perception, largely uncontaminated by its journey through tactile space and time.” (p. 84).³ The crucial role of movement in touch experience is shown in the rapid adaptation that allows us to remain mostly unaware of our clothing.⁴

The Subjective-Objective Bipolarity in Katz’s Phenomenology of Touch

Katz emphasized how two distinct, yet co-occurring aspects of the touch sense are never absent from touch experience: what

³Except in the case of elasticity.

⁴It is a common observation that people with CDB often seem to find clothing uncomfortable. Taking off shirts, hats, mittens, shoes, not wanting to get dressed etc. are frequent challenges for support persons. People with CDB gather information by using their whole bodies, limbs, skin surface etc., and clothing gets in the way of this. However, it is interesting that tensile clothing applying constant pressure to the skin surface often appears to be calming, as does the experience of being strapped into a chair or wearing a weighted vest. The pressure sense, Katz noted, “deteriorates” rapidly; clothing that is loose and moves over the surface of the body when the person moves is likely to be more distracting and uncomfortable in touch hypersensitivity than for a person with ordinary sensitivity.

he calls the objective and subjective poles. In this polarity, there is a primary subjective component in touch in which sensations of contact with a stimulus are felt on or in the body that is paired with a secondary component oriented outward to the touched or touching object. Touch is the sensory modality that best displays this dual phenomenal quality and the only one completely dependent on it. For example, despite sound being felt through vibration, which produces a tactual experience in the ear and on the body, hearing is perceptually directed toward the outside world (a situation that changes abruptly however in the case of hyperacusis, for example). Vision is almost exclusively perceptually directed to “out there,” away from me. Even when viewing an after-image with eyes closed, the experience is one of looking at an object. The subjective sensory tactual pole is primary (felt neuroreceptor response), sensational, passive-receptive, and characterized phenomenologically as “being touched by” something. The objective pole is secondary, discriminatory, active, and a perceptual experience of “touching something” (for Katz, tactual *perception* proper). Though he was most interested in the objective pole, Katz emphasized that the “object (that which is perceived) and subject (the perceiver) cannot be imagined at all as separate actors of the tactual impression” (Katz, 2016, p. 243).

Katz cites an exception to this outward orientation of the distal senses in the case of schizophrenia, in which a feeling of invasion that overwhelms the outward-objective perceptual mode can trap the perceiver in an overwhelming inward-subjective experiential state in which “everything” is on me, in me, happening to me, even *is* me (overwhelming subjectivity in touch hypersensitivity and CDB may be experienced similarly). In neurotypical tactual perception on the other hand, the perceiver normally distinguishes between feeling as sensation and having *felt something* (though not necessarily some *thing*) in a fluid, automatic manner reflected in statements such as “the bristles of this brush are prickly,” or “the examination table is cold.” Prickly and cold are qualities of the brush or table, but they are also sensations and (particularly in the case of temperature) feeling states felt on and under the surface of the skin and body touching/being touched. This bipolarity of the touch sense itself is initially purely neuropsychological and non-conceptual. It becomes thematized and conceptualized through varied and repeated exposure to the tactile world. Such thematization creates and is further developed by touch agency as the perceiver becomes a tactual explorer, essential in establishing and maintaining learning through touch (McClinden et al., 2020).

The Subjective–Objective Duality of Touch in the Phenomenology of Merleau-Ponty and Katz

In his treatment of the constancy of tactile experiences and movement in *The Phenomenology of Perception* (2012), Merleau-Ponty cites several of Katz’s observations about the importance of movement for touch perception in “knowing touch.” Katz and Merleau-Ponty reject the focus on form

recognition of the Gestaltists, and accordingly, emphasize perceptual experience as “pre-cognitive,” or pre-theoretical, though they come at this focus from different directions. In his description of Katz’s insights about the bipolarity of touch, Merleau-Ponty is concerned with making a general point about how all perception, including vision, involves both an opening outward toward an (apparently) objective “property” and a component related to the body. In this, he is keen to show how the “in front” aspect of perception, perceiving something that lies before me, is coupled with a “being in” the world in perceptual-phenomenological experience. He links gaze in vision to grasp in touch as a way of demonstrating how both involve a complementary movement of “taking-in” what is perceived. With Katz’s point that the subjective-objective polarity is never absent in touch as background, he gives an example of one hand touching the other in terms of a subject touching an object. Movement of one hand makes it the toucher, while the passive hand is the object touched.

Here Merleau-Ponty is less concerned with the subjective-objective in terms of physical touch impressions on the skin, Katz’s focus, as he is with describing perception of all kinds as the lived body’s situating of itself in relation to “the world,” a phenomenal state in which the division between subject and object cannot ultimately be drawn. In this he challenges the very notion of an objective world of invariant properties, or qualities from which sensory “information” is received, or in Gibson’s more active construction, gathered, by the exploring perceiver from “out there.” He elaborates Katz’s point, that in touch especially the perceiver in part creates the percept through movement of the sense organ, noting Katz’s observation that, in the absence of exploratory touch, qualities such as smooth and rough completely disappear. He takes this further however, in describing movement not merely as a method of access or an objective condition of discriminatory touch, but as one of the phenomenal components (with time) of the qualia “themselves” whose phenomenal existence is only actualized by active tactual exploration. Perception is embodied and phenomenal; the features of the tactile world are invariably not external constants but constituted through “my body’s overall behavior” (Merleau-Ponty, 2012, p. 331).

Katz offers a bridge between the neuro-receptor, “touch parts” approach to tactual perception and the phenomenology of Merleau-Ponty. Merleau-Ponty’s later concept of reversal in relation to the subjective-objective conundrum in perception, and his “double polarity of reflection,” the reciprocity of the un-reflected and the reflected (1968) resonates with Katz’s bipolarity of touch. In an extensive treatment of the subject, Gallace and Spence (2008) define tactile consciousness as a cognitive product of the actions of neuroreceptors studied in subjects’ performance of tactile tasks. At the other end of the spectrum, Merleau-Ponty (1968) locates touch perception as lived embodiment, describing it at a much more “advanced” turn of the “centrifugal” (p. 45) spiral of reflexive movement between the un-reflected-embodied and reflected-upon in phenomenal experience. Katz is in the middle, concerned with the psychophysiological subjective–objective dimensions in the tactual perceptions of

active touchers (“assessments” and identifications by subjects of calibrated surface texture), measured in relation to movement and time and necessarily emanating from [or, in Merleau-Ponty’s later terminology, “dawning- through” (1968, p. 9)] the neuroreceptors of the skin. Merleau-Ponty notes that in the example of one hand put in the role of subject-toucher of the other as object-touched, these perspectives are impossible to maintain, as one dissolves as soon as it is taken up and flows into the other. Katz describes a similar observation when he says that in touch, the subjective toward-the-body and objective toward the-world sensory impressions always occur together. As Merleau-Ponty notes, the very perceptual phenomenon the perception of which Katz is measuring, “microstructure,” only arises for the perceiver through an interaction of movement, skin and surface (Merleau-Ponty says that the surface “uses” the skin in a particular manner in tactual exploration; 2012, p. 330). Far from perception with the touch organ not being “contaminated” by movement and time, both are implicated as components of the percept itself. The production of “smooth” is non-conceptual, not a summary of characteristics assembled theoretically by the exploring subject; it is the hand, not the intellect, that touches (2012, p. 330).

Katz’s point, complementary to that of Merleau-Ponty but approaching it from the other direction, is that it is in the hand and not the neuroreceptors of the skin “smooth” arises for the toucher in a gliding lack of friction producing a specific feeling on and under the skin, including temperature. The touch experience is this subjective feeling on the body, nevertheless dependent on a secondary, objective dynamic related to “outside” or away from me that gains and loses momentum in a foregrounding-backgrounding reciprocity of the two. In touch, subjective feeling and the objectively “felt” (as well as the surface object “itself”) are conflated. In ordinary touch perception, there is no way to tease this bipolarity apart for any length of time. Paterson (2007) provides another illustration of this in citing Geurts’s (2003) anthropological study of the Anlo-Ewe people, who have many expressions for touch experience that blur any boundary between subjective perceiver and touched world, one of which translates as “feel-feel, at flesh, inside” (p. 35). Paterson describes how Geurts shows the ways in which these expressions “effortlessly conflate” perception with embodied emotion.

As Katz noted, the subjective touch sense-aspect as sensation related to how my body feels when in touch/touching, is primary. In recent years, the study of the cellular complexity of touch continues to turn up new worlds of response types and interactions that, for the neurologist, make up the tactual sense. Given the rich duality of lived touch experience and its importance for people with CDB however, there is need as well for good phenomenological descriptions more in line with Merleau-Ponty and the Anlo, in bringing this technical objectivizing back “down to earth” (this is the project of Phenomenology, in contrast with the popular conception of what philosophy is for). In being partners of people with CDB for whom the touch sense is all-important as the most intact of the senses, and the debilitation caused by touch hypersensitivity we need descriptions of touch experience that can inspire, provoke and support practical action in the effort to reduce or remove barriers caused by it.

The Subjective Objective Inter-Dynamic of Touch

With a starting point in all three of the perspectives sketched above, I wish to propose that the subjective-objective bipolarity of the touch sense is better described as a subjective-objective inter-dynamic, not a mere interaction or set of interactions between cells, distinct poles, mechanisms, or separate processes. Touch can be thought of as a particular form of movement, making the touch sense, phenomenologically speaking, more of a specific form of *participation*, at all “levels” of awareness, from the cellular to the reflective-cognitive, in an embodied multimodal activity called “perception.” Following Merleau-Ponty, perception is an embodied subjective phenomenon of the lived body, meaning that sensory inter-dynamism in any tactual experience will ultimately involve and be elaborated at all levels of embodied awareness, from the effects of cellular response on “up” through the reactive-emotional/emotional-psychological in reflective cognition and meaning construction. “Subjectivity” is thus a multimodal phenomenon that cannot be viewed as a separate, or purely higher-order (re)constitution of experience. Notwithstanding, however, the metaphor that is neurological “touch parts” is useful, and does not have to be viewed as in conflict, ultimately, with the phenomenological, radical embodiment perspective that I take here; the urgency and complexity of the topic require both (see Gallagher, 2005, for a thorough treatment of perception and embodied cognition that takes this into account).

The touch inter-dynamic can be described as that of the subjective-sensational dynamic (S-SD) and an objective-discriminatory dynamic (O-DD). S-SD O-DD is an inter-dynamic and cyclical movement of feeling-feltfelt-feeling feeling-felt. In summary, and using the “objectivity method” critiqued by Merleau-Ponty (1968, p. 24):

As an inter-dynamic, the touch sense involves a S-SD that is,

- Primary
- passive-receptive, addressed to or toward the skin/body; when elaborated in reflective awareness, addressed “to me”
- immediate, in that it is a
- “feeling” in terms of sensation, completely unqualified or discriminated “as such”
- this feeling is sensation on-in the body, and is
- pure reactivity, an impulse that becomes inter-dynamically incorporated into and incorporative of emotional response at the level of pre-reflective awareness, further participating in a more complex psycho-emotional subjectivity through reflective awareness
- characterized phenomenologically as *feeling* in the sense of “being touched (by)” something, or “being touched by what is felt”; under reflection this becomes the *specific feeling*, on me, of what is or has been felt. Importantly, this feeling is not *the feeling of “the object,”* which is produced by the O-DD described below.
- has a protective function of *reaction-for-survival*
- and an O-DD that is

- Secondary
- active-exploratory, initially however, not in the mode of an intention to explore through deliberate action, though this is what it is for. Rather, it is an orientation toward the object at a level of awareness just above the S-SD (hence its status as a secondary aspect of the inter-dynamic) and as such, is addressed to the object, to the “out there,” beyond the body, or as a position *toward something*, even if that something is another part of one’s body (Merleau-Ponty’s hand touching hand example)
- discriminative, as the (inter)-dynamic cycle of movement back to the object that affords the possibility for thematizing touch sense impressions, beginning in pre-reflective awareness (cellular thematization through specialized neuroreceptors) and on through cycles of increasingly reflective awareness to shape psycho-emotional meaning-making (“higher” cognition)
- Experienced as “the felt,” which, under reflection becomes thematized as the “what” that is felt, or being felt
- Characterized phenomenologically as “touching something,” the sensory perspective of the toucher
- Has the function of *discrimination-for-action*: a movement, initially just at the boundary of pre-reflective awareness, toward sensory identification of felt sensation that affords appropriate action.

This “identification” function of the O-DD, initially is unelaborated by reflective awareness, a non-theorized response, for example part of what allows us to “instinctively” change grip to avoid dropping a slippery object (see the earlier description of the DCMLS). It is the aspect of the inter-dynamic responsible for discriminative touch in exploration, the use of touch-as-tool and in learning through touch. When this dynamic is overcome by the S-SD, such capacities wither unless steps are taken to deliberately stimulate them.

Overwhelming Subjectivity as Cause, Response, and Result in Touch Hypersensitivity

Touch hypersensitivity can be conceptualized as response to tactile experience in terms of an exaggerated tactual subjective response that, when extreme, becomes overwhelming subjectivity. As a pervasive feature of hypersensitive touch experience, it will cause further retraction into more complex negative subjective states of touch aversion, avoidance and resulting isolation from the environment. In the neurochemical state of “unsafe emergency” in hypersensitivity proposed earlier, the S-SD’s survival-oriented “alerting” function is in exaggerated swing during touch perception, suppressing the O-DD (with its “action” orientation) in a lop-sided dynamism that diminishes the touch inter-dynamic and reduces tactual function accordingly. Overwhelming subjectivity in touch experience is an extreme version of this lack of inter-dynamism.⁵

⁵As noted earlier, there is a spectrum of intensity of exaggerated subjective response in touch hyper-sensitivity, in which “overwhelming” is the most extreme form.

Exaggerated S-SD responses prevent the O-DD capacities from coming into play sufficiently for tactual experience to be either tolerable or meaningful. An exaggerated S-SD response that goes unmodulated by the O-DD dynamic required for sense-making (in all respects) can be experienced in terms of perceptual chaos, including physical and emotional discomfort or pain, threat, attack, intrusion, or invasion. If it is a sufficiently pervasive and repetitive feature of this experience in the life of the person with CDB, it can calcify into a negative subjective withdrawal into one’s own body characterized by rejection of the environment and interactions with it, with obvious repercussions for all aspects of the embodied self living in an embodied world that, in CDB especially, is chiefly or only accessible through touch.

In overwhelming subjectivity, tactual stimuli are continuously constituted in perception in terms of threat to the organism. In this state, the secondary O-DD that would otherwise lead the person out into the external world of tactual exploration becomes cast neurologically and psychologically as a luxury the organism cannot afford. Thus, for the person with CDB and touch hypersensitivity, tactual stimulation is primarily an experience of *being touched* by a person, a thing, or simply by the world. She or he is never to any great extent in the position of toucher, whether neurologically (able to sense touch as contact with a *something*, actively or passively), or psychologically, as an agent moving toward the world through touch and choosing to touch or allow something to touch her or him. Importantly, this pervasive experience of being touched is consistently unpleasant, invasive, threatening, painful or even intolerable.

In this extreme state, touch may not be “touch” at all but experienced more along the lines of an affront, attack, or even rejection by the world. The modern word “overwhelmed” is a redundancy, as the original verb “whelm” means “to overturn or upset” (Merriam-Webster.com). This makes it suitable for emphasizing the connection to the psycho-emotional, meaning-constructing levels of awareness in hypersensitive tactual experience. The subjective-emotional mode of touch experience is a meaning stage structured at a higher level of reflective awareness. The meanings that tactual experience and touch will have for each person will differ and are receptive to positive change, given the right support. Tactual experience can move from being a source of aversion to one of motivation for greater engagement in the world. Development of tactual skills through this engagement can positively repurpose the perceptual acuity latent in hypersensitivity. In this way, it can increasingly present as *heightened* tactile acuity (Forsgren et al., 2018) instead. Working with touch hypersensitivity in facilitating a functional, positive connection with the touched and touching world is thus a central task for support partners and teachers for the person with CDB.

The Importance of the O-DD for Learning Through Tactual Perception

In the moment of feeling a pricking sensation in touching a plant stem, having reached into a bush to pull up weeds without being able to see what we are grabbing, we are focused in the S-SD in tactual perception. When we shift focus and begin to explore

the stem carefully to obtain information about its thorniness – how many thorns, the sharpness of point, shape, etc., we are concentrating attention on the O-DD dynamic in a perceptual orientation toward tactual exploration, discrimination of fine detail and generation of tactile information for categorization and the planning of further action. When we stroke our sun-burned arm, our attention is naturally drawn more toward the discomfort registered through the S-SD. However, when we touch the burned skin discriminatively, we are tactually assessing the severity of the burn in calibrating just how tight the skin surface feels, how deep the burn seems to be in terms of the dry thickness sensed when we apply pressure and firm movement, the texture of the skin affected, and so on. Here the O-DD dominates our attention. Though it is necessary to speak of two separate dynamics for purposes of clarity, there is only one S-SD O-DD inter-dynamic, although one quality will claim more attention than the other at any given moment.

As we have experiences and learn, our objective, tactual discriminatory abilities and memories become more robust. If, however, touch hyper-sensitivity is severe enough, there is significantly less likelihood that the O-DD function will be accessed. When tactile stimuli are not available for thematizing and sense-making, either through hypersensitivity or deprivation, they remain confusing at best and can be experienced as directly dangerous or threatening at worst. In helping people with CDB and touch hyper-sensitivity to establish a regulated tactual inter-dynamism, partners must also remember that for people without disabilities such as CDB, there is heavy reliance on touch as a substitute or support for a visual sense that may be absent (blindness), dysfunctional (combined sensory loss/cerebral visual dysfunction), or not yet fully present (earliest period of visual development). Touch supports vision in confirmation of surface microstructure and form recognition, orientation in and calibration of space and physical measurement, and maintenance of balance during movement.

Tactual perception is reliant on the kinesthetic, muscular-sensory systems necessary for movement (Paterson, 2007). Katz's observations support this view; for example, the O-DD dynamic in touch is stronger during energetic movement in connection with the tactual stimulus than in gentle movement or tickling. Emphasizing movement in tactual experience is thus a way of provoking more attention on the discriminatory function of touch necessary for exploration (part of the "enlivening" effect of active touch and touching). Varied movement is thus a resource for exploration in tactual experience. For those with CDB and touch hypersensitivity however, moving touch, particularly when being touched or having one's hands drawn over a surface by someone else, can have an S-SD impact that provokes a retraction. Facilitation of positive tactual experiences thus requires partner sensitivity, attunement, and flexible mediation.

Active, self-initiated touch is found to produce better results in tactile learning than passive touch (McClinden et al., 2020). This may be because the O-DD is stronger in self-initiated, self-maintained, and/or independently performed touch: the greater the agency of the toucher (the motivation and ability to act), the more readily available and primed the O-DD

focus will be. With support and experience, the person with CDB can reduce (sublimate, in Merleau-Ponty's terms⁶) the exaggerated S-SD response in tactual perception to admit awareness of O-DD impressions of qualities of the object or surface touched. Such moderation of the S-SD is crucial for tolerance of and enjoyment in being touched without which learning and participation in the physical and social world is severely limited. Sufficient and regulated dynamism of the S-SD O-DD inter-dynamic will allow the person to *perceive with* the touch sense rather than being victimized by it, with the dissociation from both body and external world this can create. Overcoming overwhelming subjectivity in touch is essential to becoming an actively perceiving and exploring subject.

SUGGESTIONS FOR TOUCH PEDAGOGY IN CDB AND TOUCH HYPERSENSITIVITY

Creating Motivation and Agency: An Abilities Focus

Katz noted that, "The tactual properties of our surroundings do not chatter at us like their colors; they remain mute until we make them speak . . . Touching means to bring to life a particular class of physical properties through our own activity" (p. 242). It is important for partners of people with CDB and touch hypersensitivity to make this positive perspective their focus in teaching or providing support, while keeping an understanding of the challenges of touch hypersensitivity as an informative background. Given the importance of movement for touch, for those with the severe visual dysfunction or loss that is part of CDB, it seems likely that development of object permanence (Piaget, 1954) in perceptual terms is to a large extent dependent on moving touch without which object form disappears. Repeated experiences of tactual constancy created by moving touch allow the person to construct an understanding of discrete things-in-the-world. Without this experience, there is little basis for an objective understanding of external physical contexts in an environment beyond proximal space (Fraiburg, 1977; Lederman and Klatzky, 1987).

Motivation for touch experiences with the outside, objective world is the key to overcoming hypersensitivity for the person with CDB. McClinden et al. (2020) point out that access to context afforded by a partner may not be meaningful access, and emphasis should be placed on the goal of learning to access through applying tactual skills. These goals can be met through engaging in positive touch experiences with a competent partner.

⁶"It was long believed that peripheral conditioning provided a reliable way of identifying the "elementary" mental functions and of distinguishing them from the "higher-level" functions less strictly tied to the bodily infrastructure. A more precise analysis discovers that the two types of functions intertwine. The elementary is no longer that which, when added together, will constitute the whole, nor is it a mere occasion for the whole to constitute itself. The elementary event is already invested with a sense, and the higher-level function will only achieve a more integrated mode of existence or a more valuable adaptation by utilizing and by sublimating the subordinate operations." (2012, pp. 9–10).

The touch sense repertoire of the person, discriminatory and recognition functions, and tactile working memory (Nicholas et al., 2019) are developed through positive, consistent, partner-facilitated, and mediated experiences of tactile microstructure in a context of enjoyable and interesting shared activity. These in turn strengthen interest in the world of objects and their contexts of use, larger surfaces, more complex contexts, larger spaces, and spatial organization. Access to social contexts of activity and participation and the socio-emotional and cognitive development this affords are increased accordingly. The capacity to direct robust attention to features of the tactile world is thus crucial to social and cognitive development. Tactual exploration allows for the development of higher order gestalts in the form of “image schema” elaborated into categories that organize physical experience (For example, the “container” schema, being “in” versus “outside of” something; Johnson, 1987). These organizational structures can then be transferred to new experiences and contexts in “making sense” (an apt tactual image) of the objective world. The ability to remain engaged in a toward-the-world orientation is thus crucial for learning about, adapting to, and enjoying the physical and social environment.

The medium of experiences of the environment for the person with CDB is relationships with competent and engaged partners. Creatively mediated tactual experiences shared with a partner generate increased motivation to explore an expanded interpersonal world as well as neurologically “training” the touch sense itself. Below is a summary of familiar activities in which the notions of touch hypersensitivity and overwhelming subjectivity presented in this article may provide a useful backdrop.

Taking a Bodily-Tactile Interpreter Role

Moving away from an exclusive focus on the hands in tactile experience is crucial for partners in helping the person with CDB to explore and make sense of the world. All the suggestions below are thus based on the “bodily-tactile” approach (Ask Larsen, 2013) in which the bodies of both partner and person with CDB will be in contact as instruments of communication and co-creation of understanding.

Preparation of the person with CDB by the partner, whether for novel or routine activities, transitions, or impending events is a central everyday aspect of partnering a person with CDB. People with tactile hypersensitivity require more, and more finely tuned preparation, particularly for novel physical encounters with the world. Partnering skills include initiating, staging, and calibrating acceptable physical contact, starting with parts of the body less prone to sensory overload, such as the shoulders/arms, knees/legs of the person. This is part of a larger touch-based, interpretive, and information-communicative partner role expressed as continuously and fluidly as possible in an embodied way (i.e., partner positioning, physical “framing,” scaffolding, use of haptic signals) and supplemented with tactile and vocal speech, as well as other tools such as those of assisted communication (Costain-Schou et al., 2017). In this way, the partner can create a safe base from which the world can be explored

(Nafstad and Rødbroe, 2015) constructed by actions and physical presence as well as symbolically.

Music and Dance

Music has an almost magical power to move and engage in an immediate way at all levels of awareness and has a powerful effect on cognitive functions such as memory (Trevarthen, 1999; Myskja, 2003). Human interaction is at base a form of togetherness that is intrinsically musical involving movement, temporality, rhythm, timing and improvisation (Tønsgberg and Hauge, 2003; Malloch and Trevarthen, 2009). Especially when paired with movement, it is a strong motivator for touch experience and exploration of the objective world. In addition to rich auditory experiences it can produce equally rich bodily-vibrational experiences (Palmer et al., 2012). Manipulating musical instruments and feeling the vibrations produced demonstrates the connection between the instrument (object) and the vibrational sensational experience (perceiver). Following a pianist’s hands as they play connects the toucher to the feeling of the keys of the instrument through them, and to the partner, the instrument, the activity, and the sound-vibrational experience these produce. Because sound produces vibrations felt globally (hearing “through the skin” as it were) music can provide touch experience that is easier for the person with touch hyper-sensitivity to tolerate. The touch of sound/vibration and its resonance on and in the body can produce an enveloping sensation of being held without being restrained. This holding can significantly quieten the nervous system. Music can also have an enlivening effect producing arousal and reducing passivity (Malloch and Trevarthen, 2009). Musical stimulation inspires movement and vocal expression, as well as helping to regulate arousal.

Music as a sensory bridge between the person with CDB and touch hypersensitivity and the objective world can be experienced in playing an instrument, or in a listening experience that includes manipulating a sound-producing object. Greater motivation for exploration of the world can be elicited through manipulation of such objects, particularly when they are presented as part of a musical game, involving a repetitive pattern of pleasing interaction underscored by the sounds produced (Trevarthen, 2002). Such activities create immediate cause and effect experiences that enhance the sense of being an actor in the objective world. Creating a sound or vibration through touch when playing an instrument or pressing or squeezing a toy or a button on a machine, for example, provides automatic feedback along the lines of, “My touch has an effect,” “My actions are answered.” This can further motivate the person to touch and manipulate other, non-musical objects or features of the objective world to see what effects can be produced in addition to sound vibration.

Dancing with a partner links the patterned tactile-vibrational features of music with patterned physical contact and movement emphasizing subjective-emotional connection between the dancers (Dissaneyake, 2012). It affords increased experience with interpersonal touching and being touched that is richer than mere instrumental exchanges such as being fed, changed,

informed (as opposed to conversed with) or moved about that are otherwise so dominant in the lives of many people with CDB. Dancing involves following the intentions of the other, spontaneity in movement initiated and negotiated by both partners “on the fly,” using image schematics of spatial organization such as UP-DOWN and PATH (Johnson, 1987; Kimmel, 2013). Creativity and trust as well as agency can be developed through being met as an independent contributor to the activity. Dancing together can be thought of as a form of imitation that creates embodied dialog and is symbolic of the partner relationship (Hart, 2006). Dancing provides rich sensory stimulation (vestibular, kinesthetic, motor, tactile), and helps the person develop reciprocity and the ability to connect with other people in other ways and contexts. Such experiences contribute to developing positive emotional-tactile associations that are transferrable to other contexts.

Intense Physical Experiences and Activities

Experiences that demand attention because of their intensity and complexity force a focus on the O-DD while producing strong S-SD impressions. Outdoor activities such as climbing, hiking in rough terrain, sailing, or horseback riding involve a rich array of sensory stimuli in complex, shifting and natural contexts (Gibson, 2000; Gibson and Nicholas, 2017). Such activities are “high arousal” and produce strong memories (Gibson and Nicholas, 2017). The complexity and variety of multi-sensory impressions produce an arousal process in which there is a constant, multi-modal sensory flow paired with the demands of the activity itself for responsive action; the person has little time to become stuck in an S-SD-dominated tactual response. This kind of continuous, fluid complexity can create positive “flooding” by an array of sensory impressions, including the tactual. The perceptual impacts of sensory flow, complexity and pace of stimulation and active response help develop the S-SD O-DD inter-dynamic of touch.

Being in Nature has profound positive effects on the human nervous system. Despite going on outings and being taken for walks, those with CDB often spend most of their time indoors, in carefully managed and artificial environments. In nature, even sitting still brings many sensory impressions that are organically rather than linearly organized, and constantly changing in subtle and more obvious ways. The neurological stimulation this brings reduces stress, calms anxiety, increases awareness of one’s surroundings, and provides a training ground for sensory acuity and the capacity for adaptation, all of which is beneficial for touch as well as other hypersensitivities.

Of course, a high-arousal activity, even when motivation to participate is strong, can also operate as another kind of overwhelming that can alienate rather than engage the person with CDB. The partner is essential in facilitating and moderating the experience to create a secure base from which further exploration can occur (Nafstad and Rødbroe, 2015). Well-managed activities can increase sensory integration, agency,

motivation, mastery and resilience as well as training the tactual sense through varied stimulation. They can leave a strong residue, producing memories that can be talked about afterward with a partner, giving both partners a shared experiential base and a deepened interpersonal connection (Gibson and Nicholas, 2017). The partner relationship can become more reciprocal, as both persons negotiate the demands of the activity and must work together (Gibson, 2000).

Mediating and Scaffolding the Touch Experience

An object or surface unbuffered can be “too much” for the person with touch hyper-sensitivity to touch all at once, even when tactual exploration has been established and become motivating. Hypersensitivity and regulation issues can lead to slowed, or lack of tactual adaptation (as in accommodation difficulties in vision). Too-quickly moving touch over a surface may produce so many kinds and intensities of sensations that there is no way to “sort out” in addition to the tactual discomfort produced by hypersensitivity. Scaffolding (Vygotsky, 1993; Wood et al., 1976), or partner support for accomplishment of actions the person with CDB cannot yet perform alone addresses this, for example, “hand-under-hand” techniques (Miles, 2003) such as placing one’s hand under the hand of the person with CDB while touching a cold railing, gradually allowing the person’s fingertips to contact the railing. The person can quickly withdraw from the cold railing to the security of the partner’s warm hand resting under their own. Standing behind the person and “framing” him or her with one’s arms as they explore in a tactile manner can provide a general feeling of security and stability (also vestibular) that supports focus on the O-DD in touch experience. Too much tactile information can be overwhelming if presented all at once. Covering an object with a light material, for example, may buffer and simplify the sensory experience by muting or reducing tactile “noise” so that microstructure can be acclimated to, and patterns identified. Katz’s subjects (sighted but blindfolded during testing), for example, found it easier to read braille letters through a thin film covering, which produced a homogenization that screened out all but the most prominent tactile details.

Scaffolding and mediating by partners should not be too controlling, but rather provide a flexible and responsive frame that supports the person with CDB, where gaps that might otherwise lead to abandonment of the exploration can be filled in Gregersen (2020). This consists in guiding exploration in a manner that produces and maintains perceptual coherence the person with CDB cannot yet produce themselves.

Mobility

A mobility focus in partnering the person with CDB such as that employed in work with the blind is invaluable for training tactile orientation skills and supporting the development of spatial-contextual awareness and independent movement (Joffe and Rikhye, 1991; Huebner et al., 2003). Orientation skills include systematic tactile search, trailing, identification of landmarks and identification of signage (also dimensions for observational

assessment of learning and development) (McClinden et al., 2020). The partner can support and model these skills.

Activities of Daily Living

Activities of daily living (ADL) are the precise opposite of the intense activities in the outdoors described above. They provide routine, structured situations in which the very banality of the tasks (turning on a tap for example) and the contexts in which these are performed help to make tactual action less threatening and more manageable (thus more perceptible). Systematic approaches to teaching people with CDB how to manage aspects of their environment across multiple contexts is central to preventing learned helplessness and promoting agency (Marks, 1998; Huebner et al., 2003). ADL form stable frameworks in which predictable actions within the activity are connected in a linear way. Activities such as going to the bathroom or laying the table for lunch and tidying up afterward involve many small tactual actions that can be broken up into sub-tasks and made “fault-free” (Lancioni et al., 2007), such as pushing the flush button, helping to press down the tabs on a diaper, opening a door, putting a plate in the dishwasher. In these repeated experiences, the person with CDB can develop mastery through brief moments of action that produce immediate, predictable results.⁷

Touching Using a Tool

Tools used to touch objects and features of the environment (such as the long cane used to navigate while walking) can increase interest in the objective world by revealing physical properties and qualities of this world that also make it “come alive” for the person with CDB. The quality of “height,” for example, can be illustrated by striking a tall standing object such as a lamp post to produce vibrations that can be felt at higher and higher points. A long, lightweight, and hollow plastic pole can be used to expand the tactual radius of the person, who can remain sitting or lying on the floor while exploring outside proximal space. The lightness of the pole makes it easy to move and hold, and its hollowness and length will produce subtle vibrations from resistance during movement that will provide rich tactual information about micro- and macrostructure (texture and shape, size, solidity, etc.).

In this case, the use of the tool to explore provides distance between perceiver and world that keeps this world safely “out there,” while conversely drawing it to oneself tactually. Holding a smooth object like the pole involves maintained pressure which “quiets” the S-SD, as sensation disappears rapidly in the absence of movement of the touch organ over a surface. Paradoxically, a tool for touching can provide a more intimate exploration of an object or surface than direct touch because it amplifies microstructure through forming a point of focus for tactual exploration while preventing over-stimulation of the S-SD. This type of exploration supports agency, control, and autonomy (“doing something oneself, to something with something”), as well as access to detailed information, also in terms of form

⁷This predictability provides a secure base for when “things go wrong,” the latter being a potent source of learning only when the former is in place.

and contextual organization at the macro-level (the shapes and placement of furniture in a room, for example).

Development of Communication and Language

Tactile approaches such as the use of tactile symbols, concrete objects and labeling can aid communication, development of symbolic understanding and preliteracy training for people with CDB (Bruce, 2005; Trieff et al., 2013). Literate adults with acquired deafblindness describe using a combination of sensory supports in reading, including tactile-kinesthetic strategies such as Braille and raised print that may also be useful for people who are preliterate (Ingraham and Andrews, 2010). However, tactile signing is often the only means of cultural-linguistic communication for the person with CDB. Overcoming the overwhelming subjectivity created by touch hyper-sensitivity and developing the ability to make sense of tactual experience is also crucial for language development and thus for the advancement of social, emotional, and cognitive development. Access to a cultural language can determine the extent of inclusion in the social world, and thus the number and quality of relationships with other people. For many people with CDB, this access is entirely dependent on the use of the hands.

When touch hypersensitivity is mediated so that O-DD awareness is first made possible then strengthened over time, the expanded experiential world this affords can be reflected in the increased expressiveness of the person with CDB. Touch hypersensitivity can then become a resource. Hyper-tactile perception brought into inter-dynamic balance becomes “heightened” tactile perception (Forsgren et al., 2018), and this acuity can reveal a world of detail that impresses the perceiver, is remembered, and “pointed to” afterward (“Body-Emotional Traces” or BETS, Daelman et al., 2004; Ask Larsen, 2009). A tactile experience may leave a physical sensory *trace* that makes a subjective *impression* that is remembered, and this impression is then given *expression* (Forsgren et al., 2018). The re-working or recycling of such expressions in communication reveals reflective cognitive meaning-making (Costain et al., 2019), and a new sign category based on heightened tactile perception in people with CDB has been described (Forsgren et al., 2018). Kreuger (1982) remarks that Katz’s work highlights the touch perceiver as exploring the “innards of things” in tactual experience rather than the form aspects. Partners need to take a tactual-experiential rather than a visual perspective in interpreting and meeting expressions that people with CDB have constructed from remembered tactile experience (Daelman et al., 2004; Ask Larsen, 2009; Forsgren et al., 2018).

Attention to tactile experiences and to possible reflections of these in expressions made by the person with CDB can increase “readability” of their communication, and expressions can be met in tactile conversation with a partner and negotiated into signs from cultural sign language (Nafstad and Rødbroe, 2015). Partners should respond to the person’s communicative activity, whether “readable” or not, in a tactile manner (laying hands lightly over the person’s hands or forearms as they repeat an expression, for example). The partner’s focus should not be on

“decoding” the expression, but rather showing interest in and openness to understanding it. Having personal expressions that reflect one’s own tactual experience seen and responded to in this way by a partner can strengthen trust that one is understood or that the partner is someone who wants to understand, and this in turn can motivate the person with CDB to continue exploring the objective tactile features of an external world that can be communicated about and shared (Nafstad and Rødbroe, 2015).

Identity and Becoming a Self: Speaking With the Partner About the Touch Experience

As sighted partners, we have an “out-there” relationship with perception, a constant looking out and onto a world perpetually in front of us. Thus, in our desire to engage the person with CDB in this external world, we often pay so much attention to the “out-there” that the subjective world of “in-me” is too little acknowledged. Accordingly, this perceptual chauvinism (of which we are often quite unaware) of the functionally sighted and/or hearing leaves little room for the uniqueness of perception of those with CDB, including likelihood of a subjective orientation much stronger than the objective, a reversed situation from that of the partner in the relationship. We want to pull them into our world, but we show too little respect for theirs. Wondering “out-loud” about what the person with CDB may be feeling and communicating during or following an experience indicates that the partner is interested in the unique perspective of the person with CDB, even if there is no way to confirm the accuracy of partner interpretation.

Many people with CDB and touch hypersensitivity will have difficulty distinguishing between touching (active tactual mode) and being touched (the passive mode) and need to learn when they are touching objects and when they are being touched by another, or their skin is in contact with something or someone in the world (McClinden et al., 2020). Learning to distinguish what is in me and what is outside of me, me, and not-me, is central to the construction of a self and greater agency in the world as this self. Functional vision shows us what it is we are touching, prepares us to touch, and allows us to separate S-SD from O-DD in touch with the boundary between the touched or touching object and ourselves “in view.” “Out-thereness” is a complicated cognitive schema for the person with CDB to develop, and touch is the central medium for constituting this distinction.

Hyper-focus in the S-SD leads to the experience of tactual impressions largely in terms of sensations on/in me. These may not be experienced as connected to a something-else, something outside of me, but rather *as* me, or traumatically connected to a something-else that is *inside of* me. Partner-mediated, varied and motivating tactile experiences provide secure opportunities to make distinctions between me and what is outside me, not-me, in the objective world. This distinguishing process allows a Me to emerge and reassures me that Me is not going to be subsumed by the world of touch sensation in terms of an “overwhelming subjectivity.” All of which strengthen Me, making Me more likely to engage with and become interested in O-DD tactual perception of the world beyond Me. As ME emerges and becomes

stronger, YOU can appear, and together, WE can explore this expanded world in relationship (Nafstad and Rødbroe, 2015). The partner relation is a lead-line running through this entire process and crucial to it.

An important way of thematizing the distinction between world and self is speaking together during or following a shared experience, about the touch experience the person with CDB may have had and emotional expressions connected with it, and about named tactile qualities involved in these experiences. Putting words to these experiences (vocal and/or signed, and regardless of linguistic-communicative ability), as well as meeting the authentic communicative expressions of the person with CDB and making them topics of conversation, help the perceiver with CDB to sift out salient aspects, including the me-/not-me distinction. Communication, however simple, with a partner about a shared experience supports the awareness that what is “in-me” and “out-there” can be separated, examined, organized, reconnected, and made meaningful.

DISCUSSION

In this article, I have suggested the phenomenological notion of overwhelming subjectivity as a useful way of re-imagining touch hypersensitivity and its effects in CDB. My intention has been to encourage practitioners in their work with this issue by suggesting a new angle from which to view an old problem and indicating how these ideas might be useful for support partners and teachers. I have briefly connected widely used, established practices to this perspective and suggested how they might inform the work of reducing the effects of and transforming touch hyper-sensitivity. In doing so, I have had to simplify considerably the boundless complexity of CDB and of the person with CDB as well as the touch sense to fit the scope of this article, and this simplification will necessarily be something of a caricature. Nevertheless, I believe practitioners will be interested in considering and testing some of the assertions and suggestions I have made about how we can understand the problem and its remediation, by using them to further develop engaging activities that promote tactile functionality. Testing will be ongoing and pragmatic, and guided by general questions, such as “does this perspective help me develop activities and support measures for this person that both meet needs and advance skills?” Of course, the ultimate test of this perspective will be whether it contributes to supporting the individual practitioner in meeting the common goals of increasing tolerance of and motivation for the tactile world and for tactual experience, so that the world of touch can be both accessible and enriching, part of an increased quality of life.

The S-SD mode is receptive while the O-DD is discriminatory. This division is of course artificial; for there to be sensation, there must be discrimination of a sort, and there can be nothing to discriminate without sensation, a somewhat chicken-and-egg conundrum. The subjective-sensory dynamic is primary, an immediate receptive response to tactile contact that is not thematizable beyond the felt sensation without bringing the secondary O-DD to the foreground, and this requires a higher level of awareness. They are, however, not discrete entities or

processes popping in and out of a linear process of tactual perception, nor is one inferior to the other. Rather, they are more like aspects of a single personality, with the subjective-sensory as the more organic-receptive, artistic side and the objective the more analytic-scientific and linear. In any case, to access the tactile world as a tactual perceiver, we must be able to regulate the tactual inter-dynamic that is the touch sense, to feel and discriminate in “making sense” of tactual impressions and tactile information. This inter-dynamism of tactual response is central to safe, enjoyable, and meaningful touch experience. For people with CDB, a functional touch sense is the single most important point of access to the world.

The ordinary deprivation produced by lack of exposure to varied and interesting experiences that is a risk factor in CDB becomes extraordinary deprivation when complicated further by touch hypersensitivity. Overwhelmingly subjective, on-me/in-me sensations perceived at the psychoneurological level can produce an instant retraction of the perceiver from the objective source of these impressions. This objective source can also be part of the perceiver’s own body; the nature of the touch source as objective, coming from outside, is determined by where awareness predominantly resides at any moment in the touch experience: in the subjective feeling *sensation* aspect of the inter-dynamic: “?/!,” or the objective-discriminatory, *sensing* side: “X?,” further elaborated over time and experience into “X = hard/rough/sharp” in the reflective-analytic and linguistic aspects of cognition. Repeated experiences of hyper-activation of the S-SD in touch experience can produce a corresponding, exaggerated rejection of the outside world of tactile stimulation so that the person remains neurologically, socioemotionally, and cognitively, in a world apart in which tactile contact can be minimized and avoided. At worst, in this hyper-sensory receptive mode, the body itself can be experienced as unsafe space. Left unchallenged, the resulting subjective retreat becomes a self-isolation that is perhaps the single most important block to learning, participating, and inclusion after the CDB itself.

In the state of “unsafe emergency” produced by an over-activated S-SD tactual response and lack of dynamism between the S-SD and O-DD, “safe” experiences of stereotypical self-stimulation affording disconnection from the environment will be preferred while tactile contact with and by the outside world avoided or repelled. This reflects an elaboration from the neurophysiological to higher levels of awareness or meaning-making that becomes a position of isolation within a psychophysiological, subjective world that requires constant defense. A state of being “on-alert” or hypervigilant in situations of contact can then worsen sensory hyper-sensitivities of all kinds in a negative feed-back cycle. This increases as the environment becomes more complex and demanding over time and results in entrenched patterns of resistance as the person retreats ever further into a “citadel of the self.” This creates a more complex form of deprivation that is difficult to reverse or positively influence, and the objectively accessible world becomes increasingly thematized in terms of danger, threat, unpleasantness, intrusion, and even trauma. A person with touch hypersensitivity and CDB needs to be supported in working to restore tactual inter-dynamism, regulate tactual response,

increase touch motivation, and train the tactual sense itself and its active use through pleasant and interesting touch experiences shared with a partner.

Such responses by the person with CDB to touch, even if they only occur sporadically, can lead partners to give up trying to provide tactual experiences, or to restrict these experiences to avoid causing distress. Like everyone else, people with CDB and touch hypersensitivity are unique individuals, and the situation above is an oversimplification at the extreme negative end of a broad spectrum. As well, “touch hypersensitivity” is not a monostate, and as remarked earlier, will present in different ways and intensities in different situations and contexts, on different days and even times of day for each individual who lives with it. However, though touch hypersensitivity must be lived with, it must not be acquiesced to by partners. It is in learning to attune and actively employ the touch sense that the tactually sensing subject becomes a toucher and feeler and overcomes overwhelming subjectivity in response to the tactile world. The central aim of the support partner or special education teacher should be that of helping to transform patterns of negative *reactivity* into modes of constructive *responsivity* through facilitation of enjoyable, interesting, and motivating tactile experiences. People with CDB who are sensitive in the touch modality to an extent that is disabling can be supported through mediated contact in neurologically “educating” their tactual discriminatory abilities. When the tactual apparatus begins to be moderated to become more functionally (inter)dynamic and thus an asset rather than a barrier to development, attention can more easily be actively shifted toward developing agency in the outside world. This fundamental ability to “shift perspectives” has widespread implications for all aspects of development of the person. The ability to remain in or return to tactile contact despite an initial exaggerated, negative subjective response is developed and stabilized through facilitated activities with a partner. The capacity for neurological tactile accommodation and differentiation is supported and afforded (and “taught”) by motivating and motivated tactile experience. Increasing tactual tolerance and motivation provide a form of access to learning that is also and at the same time learning to access.

Overwhelming subjectivity in touch hypersensitivity is a source of alienation from the self, as well as from the world (including one’s own body). When there is extreme negative focus on the subjective, inner-addressing, sensational component of a tactile experience, the retraction that this produces causes both the S-SD and the O-DD to dissolve, and the entire tactual sensory mode itself to collapse. When this happens, the environment outside the person with CDB effectively all but disappears. As an entrenched and unchallenged pattern, it can lead to the person herself disappearing, as identity development and maintenance are (also) reliant on the distinction of a self from other selves, and this distinction is severely threatened when interaction with other selves is minimal and characterized by invasiveness. Behavior problems arise and become established, and other psychological issues such as anxiety complexes rapidly crystallize around the problem of neurological hypersensitivity.

Being in the position to learn in, through and about the objective world as a tactually perceiving subject relies on the

capacity for discrimination between impressions felt subjectively as addressed to one's body from those made by tactile qualities of the objective world. Tactual discrimination of these qualities conveys necessary information that reveals this world to me as an actively attending perceiver able to deliberately foreground the O-DD in touch perception. The partner or teacher is instrumental in helping to make this distinction clear in thematizing touch experience through structured, facilitated activities and mediation. The strong and positive orientation toward the objective-discriminatory aspect in all sensory perception is crucial to the development of identity as a subjective "me," an agent who can access, explore, and enjoy this world along with others. Just as the S-SD and O-DD is an inter-dynamic that produces and comprises the touch sense, the inter-dynamic between a me and a not-me is necessary for the development of identity and relationship. Distinguishing and accessing the objective, what is not-me, affords reciprocal access to greater contact with the subjective, what is me or addressed to me, which again affords access to the objective, and so on. The O-DD dynamic in tactual perception is key to information-gathering at the reflective cognitive level, and is reflected in processes of psycho-emotional meaning-making in the ability to perceive (discriminate), observe, register and explore one's own subjective

reality. Increased powers of perceptual discrimination in and across all sense modalities support the emergence of a subjective self that can be addressed, also by oneself, a self that has feelings and thoughts and a point of view, sovereign, but not alone.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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Conflict of Interest: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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