Embodied Cognition and the Development of Language for Individuals who are Congenitally Deafblind

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*Individuals who are congenitally deafblind are presented with significant challenges when attempting to acquire language and communication skills. Since most of the information perceived is gained through direct bodily contact, cognitive processes necessary for language development remain closely connected to the body’s interaction with the environment. The embodied cognition approach, with its focus on specific body-environment interactions, may offer some insights into the way individuals who are congenitally deafblind develop language.*

The embodied cognition approach within cognitive psychology highlights the association between an individual and the particular way that individual’s body acts upon an environment as the driving force for cognitive development. Thereby, “cognition depends on the kinds of experience that come from having a body with particular perceptual and motor capacities that are inseparably linked and that together form the matrix within which memory, emotion, language, and all other aspects of life are meshed” (Thelen et al, 2001, pg.1). According to such views, higher order cognition has its basis in sensorimotor processing and “the very structure of reason itself comes from the details of our embodiment” (Lakoff & Johnson, 1999, p.4). The suggestion is not that concepts depend on specific physical capabilities; individuals who are differently-abled would not be predicted to possess markedly divergent concepts, nor is conceptual development limited to direct experience or activity. Rather, the approach argues that to understand the human mind we must consider its place in a body that interacts with a world. Sensorimotor experience and the recruitment of bodily resources for cognitive processing are key.

It is this consideration of the manner in which the body interacts with the environment and the resultant cognitive adaptations that develop that may contribute to our understanding of language development for individuals who are deafblind. The perceptual and motor capacities that develop for those who are deafblind will reflect the restrictions of vision and hearing impairment from birth. (Here, reference will be made to those individuals who are congenitally deafblind as opposed to those who have acquired deafblindness. Although there are difficulties inherent in developing communication skills for both populations, the particular challenges that face those who are born both visually and hearing impaired are arguably more complex.)

Embodied cognition as an approach to the study of the mind is associated with
the following six claims, according to Wilson (2002). This first claim is that *cognition is situated*. Cognition occurs in a real world environment, with perception and action intrinsic components of this processing. The second claim is that *cognition is time-pressured*. Cognition as real-time interaction with the environment is emphasised. The third claim is that *we off-load cognitive work onto the environment*. Because humans are limited capacity information processors, we use aspects of our environment in order to reduce cognitive workload, and maximize processing capacity. The fourth claim is that the *environment is part of the cognitive system*. This is perhaps the most contentious claim, effectively suggesting a mind-world continuum in terms of information processing, and limiting the usefulness of considering mind as a separate entity. The fifth claim is that *cognition is for action*. Thus perception and memory are considered in terms of their role in determining and guiding situation-appropriate behaviour. The sixth claim is that *off-line cognition is body-based*; even remote from particular activities in the environment, cognition is shaped by environmental interactions. Wilson (2002) provides a critical evaluation of these claims as they apply to normal cognition, and within cognitive science debate continues as regards the precise assumptions and merits of the embodied cognition approach. However, for our purposes the above assertions may provide a useful framework within which to consider the nature of interaction with the environment and conceptual development for individuals who are deafblind. Combined vision and hearing impairments severely constrain interactions with the environment. While loss of one or other of these senses need not preclude alternative access to environmental information, the combined loss or deficit in both substantially reduces the sensory input available from the environment and limits motor function within it. Cognitive development for those who are deafblind will reflect these limitations and will benefit from the use of particular cognitive tools that assist in making sense of the world.

According to the first assertion above, real-time cognition has its basis in situated activity, though much of human cognition occurs ‘off-line’. A combined loss of visual and auditory input would seem to limit the level of abstraction that can occur in off-line processing; thus cognition would involve situated action and the memory thereof. This emphasis on *situated action*—an action that is situated in a cultural setting, and in the mutually interacting intentional states of the participants (Bruner, 1990) - seems most relevant to the deafblind situation. David Goode’s (1994, pg.119) sociological research of two congenitally deafblind children describes the phenomenon of a type of ‘language’ called *conversation with our bodies*, which is “produced by particular bodies, with specific biographies, at some specific time, in particular relationships, and interpreted as such by interactional participants”. The specific shared code for communication described develops from this link of the body within a certain environment and is understood through a process of mutual interpretation and collaboration. Communication theories addressing deafblindness have been developed which, in essence, accentuate a negotiation process whereby cognitive development is assisted through opportunities for communicative interaction (Souriau, 2002).
Nafstad and Rodbroe (2000, pg. 27) contend that individuals who are deafblind refer to events by “whatever impression the deafblind individual received from the event through and directly on his body”. Conceptual processing becomes predominately and directly mapped through these impressions. How one encounters the world while performing an action in a particular environmental context determines the way one forms concepts and how they are represented and stored in memory. Conceptual categories assist cognitive processes by representing information in an economical way (Roth & Bruce, 1995). Aspects of the world that are experienced by individuals who are deafblind will become categorized and referred to based on a specific bodily interaction or given occurrence.

The second claim regarding cognition being time pressured seems to follow closely with the third claim regarding off-loading cognitive work on to the environment. Cognition has evolved with the pressures of real-time interaction. With vision and hearing compromised the load that the cognitive system can normally bear, through use of mental images and stored representations for example, may be reduced. With vision and hearing loss, the off-loading of cognitive work to the environment may be critical in how the body helps the mind to perform more economically. Tactile objects of reference used in calendar systems or in communication books can be seen to support individuals who are deafblind at maintaining discourse while minimising the load for internal processing. Prevalent to this population are stereotypic and ritualised behaviours, like rocking or hand flapping, which have been examined with regard to their possible functional and developmental benefits (Murdoch, 2000). These behaviours may also play a role in supporting cognition. In Goldin-Meadow's (2003) extensive research, gesture has been found to be more than just communicative when it accompanies speech, for it plays an important role in assisting cognitive processes and reducing cognitive effort. In the absence of speech, which is true for a majority of individuals who are congenitally deafblind, attempts at such adaptations may emerge in apparently stereotypic behaviours. Signed echolalia, similar to the echolalia in speech and often regarded as a stereotypic behaviour could be considered as a method of extending or externalising a thought for some individuals who are deafblind. When used in a conversational setting, signed echolalia may provide cognitive assistance to sustain discourse.

The fourth claim of embodied cognition states that the environment is part of the cognitive system. The information that flows between mind and world is continuous such that the body-world system may be considered as the basis for cognition rather than the traditional conceptualisation of mind as a separate entity. For Wilson (2002) this distributed approach to cognition is the most problematic of all the claims; however in the absence of distance senses the impact of environment on the individual's thinking is immediate such that separation of thought from the surrounding environment becomes less palpable. Perhaps Anderson’s (2005) example of the “blind man and his cane” (from
Merleau-Ponty, 1962) can explain how in some cases cognition is best understood by considering bridges to the environment, that outer world, and the body as a single system of analysis. The man feels not with the hand holding the cane but with the cane, and the world is experienced through the cane almost as part of the body, the tool serving as an extension to the existing senses. With both distance senses compromised, the world exists as it makes contact with the body and the role of other people in extending knowledge of it becomes critical. Activities which involve mutual attention to particular aspects of the environment will enrich the capacity to represent that world for such individuals.

The last two claims of embodied cognition are that cognition is for action and that off-line cognition is body based. Cognition, by this view, is best understood in terms of the production of situation-appropriate behaviour. Without the distance senses to shape behaviour, developmentally, for those who are congenitally deafblind the world has been presented in a fragmented and unpredictable way. Consequences to behaviour cannot be readily anticipated, as for example when someone might see or hear a touched object fall over. Without these senses, cognitive mapping develops from individualised environmental experiences that one who is congenitally deafblind may have and ‘thinking’ would seem to involve physical impressions directly related to such interactions. The claim that normal off-line cognition is body based is attracting support in empirical research in recent years. Off-line cognition refers to processes such as mental imagery, recalling memories or daydreaming, which involve the simulation of physical events internally. Visual imagery, for example, would seem to be share processing resources and have much in common with visual perception. In the absence of visual and auditory input, direct impressions on the body are internalised. Off-line cognition grounded in bodily contact is evident in natural gesture and in the Bodily Emotional Traces (BETs) described by the DbI Communication Network (Daelman et al., 2004). Therefore reference to an event will rely on specific previous interactions, and the emotional significance thereof, with understanding of that event and the ability to refer to it constrained accordingly.

Individuals who are congenitally deafblind face an arduous task in attempting to acquire language and communication skills. This population is deprived from both normal sensory input and social experience from birth, thus minimal opportunities for acquiring communication skills arise. The cognitive processes necessary for language development become associated with the specific way one who is deafblind interacts with the environment. The embodied cognition approach, by focusing on the manner in which a mind, body and world mutually interact together, may prove informative with respect to facilitating communication in this group.
REFERENCES


