A-not-B abstract

The effects of novel, self-guided locomotor experience on cognitive development of executive function are examined in this project (Tots on Bots). In order to effectively test the effects of the locomotor experience on executive function development, 5-month old infants are given a Bayley Scale of Infant Development and attend 12 ‘play’ sessions, followed by a cognitive assessment at 7 months. Infants are randomly assigned to either an experimental condition or a control condition. If in the experimental condition, infants use a locomotor device to move towards toys, while if in the control condition they reach for nearby toys. The cognitive assessment consists of multiple tasks designed to target and evaluate specific executive functions. Executive functioning refers to higher level neural processes relating to controlled thought and goal-directed behavior. These processes included inhibitory control, working memory, cognitive flexibility and the planning and execution of voluntary actions (Espy, 1999).

Object concept, an aspect of Piagetian theory, describes an infant’s conception of an object’s existence as fixed and having a location that is separate from the infant subject and their actions. At some point in human development, infants’ conception of objects shifts from impermanent and in constant relation to their actions, to a permanent conception, that is independent of them. The development of this shift in object concept relates to a shift in skill of searching behavior, a process which is directly affected and controlled by executive functioning, thus serving as a marker of executive function development.

The A-not-B task has been developed as a measure of object permanence. Our version integrates the use of a computer simulated AB task and a gaze tracking device. The simulation has four phases, each which contain 5 trials, in which a dog enters a dog house in several manners. On each trial a dog enters a doghouse and then the screen goes blank. The infant can cause the dog to reappear by looking at the correct doghouse. On early trials the dog goes to dog house A but later switches to dog house B (A-not-B). Using the gaze tracking device and visualization software, it is possible to see where exactly the infant is looking in relation to the task. Tracking the infant’s gaze is especially important for measuring anticipatory or valid looks, which indicate whether or not the infant is able to distinguish between location A and location B, whether the infant can inhibit the looking pattern from the previous phase, and it gives the researchers an overall sense of what the infant’s attentional control looks like. Points are added up for each correct look the infant makes. This research is ongoing and results of our data analysis will be reported in my poster.

References