

Aspects of the Environment Can Affect Child Development

This section will include information about the sensory affordances of objects / activities and how they can enhance performance.

De Barros, K.M.F.T., Fragosos, A.G.C., de Oliveira, A.L.B., Filho, J.E.C., & de Castro, R.M. (2003). Do environmental influences alter motor abilities acquisition? *Arq Neuropsiquiatr*, 61(2-A), 170-175.

The authors of this study examine environmental variables that may impact motor development. They specifically highlight the importance of sensorimotor integration in motor learning through feedback and feed forward. To examine motor learning, 100 healthy preschool age children participated in a variety of motor tasks and questionnaires were completed regarding numerous environmental variables. In addition, the effects of SES were examined as well. The motor tasks included static balance, dynamic balance, fine motor coordination activities, drawing, copying, throwing to a target, and serial finger to thumb touching. Environmental issues included variables such as attendance in public day care or private school, the place where the child spent most play time (for example in the crib, carriage, held by adult, independently on floor), types of toys available to the child, and length of time being breastfed. The researchers found that there were differences in fine motor development between children in public vs. private schooling with the children in public daycare demonstrating fine motor delays. In addition, children who were less able to move freely through their environment, such as those who were held more or placed in infant seats also had slower motor development. Lower SES and having improper toys for developmental age were also related to poorer motor development.

*This article was obtained through interlibrary loan and was translated into English in the original journal.

Lewis, M. (1992). Individual differences in response to stress. *Pediatrics*, 90(3), 487-490.

This article focused on observing newborns and infants in response to an induced stressor (a heel-stick procedure that is performed on all newborns to screen for hereditary and metabolic disorders) one to two days postpartum. Threshold (“...the amount of stimulation necessary to produce either a negative or positive response”), dampening (“...a child’s ability to stop responding to a particular stimulus once threshold has been reached”), and reactivation (“...a child’s ability to become aroused again once arousal and dampening have occurred”) are defined and discussed. These three features of the nervous system are related to the behavioral features of temperament. To identify stable measures of reactivity, each newborn’s heel was lanced in a routine manner while an examiner observed and recorded the newborn’s reactions to the initial heel stick and to the subsequent perturbations intervals, which were rated on a 4-point intensity scale. The infants were then again reexamined at 2-months of age in relation to their response to stress (the pain of their first series of inoculations) to determine if the environment influenced an infant’s reactivity to a negative stimulus (pain). It was found that there was a significant relation between the threshold response and the average overall reaction to the perturbation. The results of this study suggest that infants who are highly reactive remain so regardless of environmental influences, however, low—to-moderate reactive infants, are highly affected by their environments. For low reactive infants, a responsive environment would result in low-to moderate reactivity, whereas a less responsive environment would result in high reactivity. The ability of infants to suppress the response to pain was negatively related to illness, which means that the more the infant was unable to suppress his or her response, the more the incidence of illness. The threshold response could not predict how long it would take the newborns to quiet.

Sign Note: This article is indirectly related to A. Jean Ayres work especially in relation to a child’s ability to obtain and maintain an optimal level of arousal. It would be interesting to see if the children who had low thresholds and difficulty suppressing pain demonstrate sensory integration issues specifically related to sensory modulation.

Gibson, E. J., & Walker, A. S. (1984). Development of Knowledge of Visual-Tactual Affordance of Substance. *Child Development*, 55(2), 453-460.

Infants of 12 months were familiarized in the dark with an object of either a hard or an elastic (spongy) substance. Following 60 sec of manipulation, a visual preference test was given with simultaneous presentation of 2 films of identical objects, 1 moving in a pattern characteristic of a rigid object and 1 moving in a pattern characteristic of an elastic object. Infants handled the 2 substances differently in an appropriate manner and looked preferentially with more and longer first looks to the type of substance familiarized. A replication of this experiment with familiarization in the light yielded comparable results. A third experiment with 1-month-old infants allowed them to mouth objects of either a hard or a soft substance for haptic familiarization and then tested looking preferences with real objects moving rigidly or deforming. These infants looked longer at the object moving in a manner characteristic of the novel substance. The results, together, suggest that quite young infants detect intermodal invariants specifying some substances and perceive the affordance of the substance.

Berthenthal, B. I. (1996). Origins and Early Development of Perception, Action, and Representation. *Annual Review of Psychology*, 47, 431-459.

Research relevant to the origins and early development of two functionally dissociable perceptual systems is summarized. One system is concerned with the perceptual control and guidance of actions, the other with the perception and recognition of objects and events. Perceptually controlled actions function in real time and are modularly organized. Infants perceive where they are and what they are doing. By contrast, research on object recognition suggests that even young infants represent some of the defining features and physical constraints that specify the identity and continuity of objects. Different factors contribute to developmental changes within the two systems; it is difficult to generalize from one response system to another; and neither perception, action, nor representation qualifies as ontogenetically privileged. All three processes develop from birth as a function of intrinsic processing constraints and experience.

Interesting links

Marek Kopicki

Learning object affordances by imitation. See Below

<http://www.cs.bham.ac.uk/~msk/report3/report3.pdf>

See <http://www.trincoll.edu/depts/ecopsyc/perils/folder5/prelim.html>

Also see <http://www.psych.nyu.edu/adolph/PDFs/Advances1993.pdf> for a pdf regarding the development of perception of affordances.

<http://www.psych.nyu.edu/adolph/PDFs/Advances1993.pdf>