Seeing, Reaching, Touching: The Relations Between Vision and Touch in Infancy by Arlette Streri; Tim Powell; Susan Kingerlee

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to the study of human development. At the opposite end of the spectrum, Perone makes a convincing case for the utility of single-subject designs addressing both reliability and validity issues and illustrating how such designs may be employed to address developmental research questions. To add to that point, Ray and Delprato offer behavioral systems methodology as an approach to the investigation of the spatial and temporal organization of behavior and organism-environment interactions. Of particular interest according to these authors, is the notion that the structural and functional analysis of behavior needs to be complemented with an operational analysis. As proposed, operational analysis is a means to examine the timing of changes in behavioral elements and their organization and, thus, to provide descriptions of systemic temporal organization.

Anybody who is confused about the logic and application of repeated measures analysis of variance and unable to find an adequate textbook account on that topic should read the chapter by Hertzog. In it, an excellent comparison is provided of univariate and multivariate analyses of such data as well as guidelines for choosing between them. Finally, McArdle and Nesselroade introduce the reader to multivariate analyses of longitudinal data via structural equation modeling. Without overwhelming the reader with many technical details, the authors first compare these newer analysis techniques with more conventional ones and then illustrate the flexibility of the former in reference to the conceptualization of alternative models of change and its structural organization.

Overall, this book contains valuable information and provides a useful set of readings for graduate courses in developmental research methodology.

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In this slim volume, Arlette Streri presents an exhaustive review of recent experimental work on the development of reaching, grasping, and the coordination of vision and touch during infancy. Throughout she presents detailed analyses of results in each of these domains, advancing
conclusions about the fine-tuning of prehension that occurs during development. In an early chapter dedicated to describing infants’ reaching behavior, Streri finds that the act of reaching undergoes major reorganization during the first 6 months, but that the discontinuity in reaching reflects not a discontinuity in either perceptual or cognitive abilities, but instead indicates difficulties in motor planning and organization. In particular, Streri emphasizes research on infants’ reaching for contiguous objects, objects on a support, objects that move in relation to one another, and objects placed among other objects. Small modifications in each of these situations can markedly alter the infants’ reaching behavior in sometimes unpredictable ways. Based on these data, Streri suggests that we should consider reaching and other forms of prehension not only as “a performance which reveals an underlying competence (in the Chomskyan sense). It is itself a competence” (p. 80).

Streri addresses the issue of tactile sensitivity, of the hand and of the mouth. Here we find that all of the cutaneous receptors are present at birth, although they will undergo further maturation. For example, full-term infants show greater sensitivity to touches on the abdomen than do preterm infants, and haptic habituation occurs for only full-term babies. Streri summarizes the clinical descriptions of infants’ grasping behavior and goes on to describe the sensory abilities of the haptic system. Infants clearly tailor their oral and manual exploratory behaviors to properties of an object (its pliability, for example) and recognize objects that they have felt before. Streri reports one ingenious experiment she conducted. Five-month-old infants’ recognition of an object’s shape was tested under two different conditions. Infants who were given a handle with a distinctive shape on its end to manipulate freely showed recognition on a posttest. Those who were required to perform a turning action with the handle did not. The constraints imposed by the experimenter demanded that the hand be used in its reaching capacity which interfered with its perceptual function. Overall, Streri reports that from birth the tactile system is functioning perceptually. Initially the mouth is used for exploratory purposes, but swiftly becomes the goal to which the hand carries objects. Beginning at age 2 months, manual functioning is similar to visual: babies are able to detect information about objects and recognize objects they have felt before. According to Streri, however, the tactile system is unique in two ways as well. First, a hand has both a carrying function and an exploratory/perceptual function that the infant must coordinate or choose between. Second, having two hands allows for division of labor, adding to the complexity of information gathering.

The remainder of the book emphasizes the coordination of vision and touch. According to Streri, the conditions for establishing a perceptual unity of information received via the two sensory modalities seems to
be fulfilled early on and she presents a wealth of data indicating that infants perceive shape, weight, texture, and other properties of objects. But Streri rejects the idea that the senses are undifferentiated at birth. Instead she focuses on the asymmetries in the development of each modality individually and the patterns of results found with infants with respect to the recognition of objects experienced first in the other modality. For example, in general, 2-month-old infants visually recognize objects that they have already felt, but fail to demonstrate tactual recognition of objects they have seen. At age 5 months, the reverse appears to be true. Echoing an earlier argument, Streri suggests that reorganization of each modality leads to such discrepant results. Five-month-old infants have begun to transport objects from hand to hand or from hand to mouth which might disrupt the perceptual function of the hand. Moreover, Streri has found transfer in situations in which infants are visually presented with a sketch rather than a three-dimensional object at test.

In summary, a detailed analysis of infants’ reaching behavior and the integration of reaching/touching and looking are presented. Streri poses competing hypotheses about the organization and function of these behaviors, citing work by Bower, Gibson, and others. Although she does not present a completely satisfactory account of her own, she skillfully points out how asymmetries and seemingly discrepant results may be reconciled or entered into a developmental framework. Those interested in either intermodal perception or motor development will find Streri’s book an excellent review. Others, more interested in cognitive development, should find it a useful tool for examining the development of perceptual and cognitive skills as the outcome of coordination of perception and action.

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After tottering from a prolonged period of severe criticism concerning the scientific value of trait constructs, personality psychology has restored its equilibrium in recent years so that it can get on with the task of