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Preferential looking / Head-turn preference procedures

The preferential looking paradigm (PLP) and head-turn preference procedure (HPP) are experimental methodologies employed by researchers to measure infants' and toddlers' spontaneous looking and listening behaviours towards visual and auditory stimuli. The preferential looking paradigm typically compares infants' looking times towards pairs of pictures presented side-by-side, while the head-turn preference procedure measures the duration of infants' listening times to differing streams of sound. The techniques allow the investigation of aspects of early perceptual, cognitive and linguistic development that would otherwise be difficult to explore in young infants, such as their ability to discriminate between stimuli, their natural or experimentally-induced preferences for stimuli, and their knowledge or learning in relation to the stimuli presented.

Use of the preferential looking paradigm to explore infants' discrimination of visual stimuli was first reported by Robert Fantz in the 1960s. By presenting young infants with a grid of black and white stripes of varying widths alongside a uniform grey square matched for luminance, Fantz was able to identify developmental changes in infants' visual acuity: While 6-month-old infants were able to discriminate stripes of just 1/64th inch in width from the grey square, infants under 1 month were unable to distinguish the two stimuli unless the stripes were 1/8th inch wide. In the same series of studies, Fantz reported a preference for face-like stimuli over faces with 'scrambled' features in infants of just a few weeks old, suggesting that infants are born with, or very rapidly acquire, a template for recognising faces.

The preferential looking paradigm was further developed in the 1980s to allow the investigation of young children's language comprehension. In the *intermodal preferential looking paradigm* (IPLP), infants are seated in front of two adjacent displays on which pairs of images or videos are presented while an auditory stimulus directs the child where to look. Cameras above the displays record infants' eye movements and allow the time they spend looking at each to be measured off-line. Using this set-up, Roberta Golinkoff, Kathy Hirsh-Pasek and colleagues found that 16-month-old infants looked longer at images of labelled objects than at distracter objects when they heard an object name (e.g. "Find the cookie!") and looked longer at video clips of matching actions over mismatching actions when they heard a verb (e.g. "Which one is drinking?"). Numerous studies have since confirmed that comprehension of a word or sentence typically results in preferential looking towards the display to which the word or sentence refers, and researchers have exploited this finding to explore the conditions that support word learning in the laboratory.

The head-turn preference procedure (HPP), also known as the *preferential listening paradigm*, is used to explore infants' ability to discriminate pairs of linguistic or non-linguistic auditory stimuli. In this procedure, developed by Deborah Kemler Nelson and colleagues in the 1980s for use with infants of 6 to 12 months, the child is seated between two audio speakers. Trials begin when a flashing light next to one of the speakers attracts the infant's attention; when the infant turns her head towards the light, a continuous stream of sound is played from that side until the infant looks away. Distinct streams of sound are played from the two speakers; the duration of infants' looking towards each side therefore provides an index of their interest in hearing the two types of stimuli. Using this procedure, Peter Juszcyk and Richard Aslin reported that 7.5-

month-old infants listened longer to sentences containing words to which they had received prior familiarisation than they did to sentences containing non-familiarised words, while 6-month-olds showed no preference. This study reveals the age of emergence of the ability to recognise individual words within continuous sentences, known as *speech segmentation*.

The popularity of the preferential looking and head-turn preference procedures lies in part in their flexibility as research tools. Paradigms based on looking time have been used to answer questions relating to perceptual, cognitive, linguistic and social development in children from birth to three years of age. Both procedures can be used to uncover the spontaneous preferences infants bring with them to the test session, such as a preference for their mother's face over a stranger's face, or for their mother's voice over a stranger's voice, and both techniques can be used to detect preferences that are induced through familiarisation or learned through training in the laboratory. A further strength of these paradigms is their objectivity, in that they allow tight experimental control over the stimuli presented and 'blind' (unbiased) coding of participants' looking or listening behaviour. However, as is often the case with laboratory techniques, some researchers criticise these methods for lacking ecological validity, and question the claims of infant abilities that are built on their results. Other concerns relate to the unexpected direction of the looking preferences sometimes found. In listening procedures, for example, infants might display a preference for either a familiarised or novel stream of sound, depending on the precise parameters of the study. Nevertheless, the presence of a preference in either direction in these paradigms is evidence that a difference between the stimuli has been detected, and this is generally sufficient for conclusions to be drawn in relation to the experimental hypothesis.

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See Also: Assessment of language abilities; Early word learning; Spoken word recognition (development of).

Further Readings:

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Caption: Typical set-up for the intermodal preferential looking paradigm. Infants are seated in front of two screens, each displaying a different image. A central loudspeaker delivers a recorded instruction to look at one of the images (e.g. “Look! Mouse!) and video cameras positioned above each screen record the infant’s looking behaviour in response to the instruction.