**Methods of Studying Infant Perception**

**研究婴儿感知能力的方法**

In the study of perceptual abilities of infants, a number of techniques are used to determine infants' responses to various stimuli. Because they cannot verbalize or fill out questionnaires, indirect techniques of naturalistic observation are used as the primary means of determining what infants can see, hear, feel, and so forth. Each of these methods compares an infant's state prior to the introduction of a stimulus with its state during or immediately following the stimulus. The difference between the two measures provides the researcher with an indication of the level and duration of the response to the stimulus. For example, if a uniformly moving pattern of some sort is passed across the visual field of a neonate (new born), repetitive following movements of the eye occur. The occurrence of these eye movements provides evidence that the moving pattern is perceived at some level by the newborn. Similarly, changes in the infant's general level of motor activity —turning the head, blinking the eyes, crying, and so forth — have been used by researchers as visual indicators of the infant's perceptual abilities.

在对婴儿感知能力的研究中，许多技术被应用于确定婴儿对不同刺激的反应，由于他们（婴儿）无法用言语表达或者填写问卷，所以自然观察的非直接性技术被应用于确定婴儿看，听，感知等的要表达的本意。这些方法都是将在刺激引入前和刺激引入的同时或紧随其后婴儿产生的反应作对比。对刺激的反应程度和反应持续时间是可以提供给研究人员的两种不同的评判标准。比如说，如果一个移动的物体的通过新生儿的视线『即重复移动眼睛进行跟随发生的话』。这个眼球移动的现象就说明移动的物体在一定程度上引起的新生儿的注意。同样的，改变新生儿的一般程度的活动，比如摆头，眨眼，哭或者别的，都可以提供研究人员对于婴儿感知能力的研究提供直观参考。

Such techniques, however, have limitations. First, the observation may be unreliable in that two or more observers may not agree that the particular response occurred, or to what degree it occurred. Second, responses are difficult to quantify. Often the rapid and diffuse movements of the infant make it difficult to get an accurate record of the number of responses. The third, and most potent, limitation is that it is not possible to be certain that the infant's response was due to the stimulus presented or to a change from no stimulus to a stimulus. The infant may be responding to aspects of the stimulus different than those identified by the investigator. Therefore, when observational assessment is used as a technique for studying infant perceptual abilities, care must be taken not to overgeneralize from the data or to rely on one or two studies as conclusive evidence of a particular perceptual ability of the infant.

但这些技术也是有局限性的。第一，两个甚至更多的观察者也许不会察觉到特殊

反应的发生或者什么促使他发生，这样的话这种观察就是不可靠的。第二，反应

难以被量化，婴儿的很多反应是发生的在很短的时间内以至于研究人员很难准确

记录。第三点也是最重要的一点，不可能非常明确的说婴儿的反应是由现存的刺

激或者后产生的刺激所导致的。婴儿可能只是对刺激所表现的反应可能因观察者

的不同而不同。同时必须要注意的是，用这些技术所产生的观察结果必须过于从

资料中概括或者仅仅只是靠一个或两个特殊的婴儿感知能力研究而作为收集到

的证据。

Observational assessment techniques have become much more sophisticated, reducing the limitations just presented. Film analysis of the infant's responses, heart and respiration rate monitors, and nonnutntive sucking devices are used as effective tools in understanding infant perception. ■Film analysis permits researchers to carefully study the infant's responses over and over and in slow motion. ■Precise measurements can be made of the length and frequency of the infant's attention between two stimuli. ■Heart and respiration monitors provide the investigator with the number of heartbeats or breaths taken when a new stimulus is presented. ■Numerical increases are used as quantifiable indicators of heightened interest in the new stimulus. Increases in nonnutntive sucking were first used as an assessment measure by researchers in 1969. They devised an apparatus that connected a baby's pacifier to a counting device. As stimuli were presented, changes in the infant's sucking behavior were recorded. Increases in the number of sucks were used as an indicator of the infant's attention to or preference for a given visual display.

观察评估技术变得更加复杂，所受的限制也在减少。膜状婴儿反射分析，心脏和呼息频率的稳定性和奶嘴被作为高效的工具用于理解婴儿的感知能力。膜状反射分析允许观察者小心的一遍遍的研究婴儿的相对缓慢的反应。通过婴儿在两次刺激之间的注意力的长度和频率可以制造出严谨的数据标准。心脏和呼吸频率测量仪可以在新的刺激产生时提供给观察者婴儿的心跳次数和呼吸间隙。数值增长被用于一些新刺激的兴趣提升。1969 年，奶嘴的吮吸动作的增加次数首次被研究人员作为评估标准。他们设计出了一个连接着仪表的婴儿奶嘴。只要刺激出现，婴儿的吸允习惯就会被记录。吮吸次数的增加也就变成了对婴儿所表现出的注意力以及喜好的直观展示。

Two additional techniques of studying infant perception have come into vogue. The first is the habituation-dishabituation technique, in which a single stimulus is presented repeatedly to the infant until there is a measurable decline (habituation) in whatever attending behavior is being observed. At that point a new stimulus is presented, and any recovery (dishabituation) in responsiveness is recorded. If the infant fails to dishabituate and continues to show habituation with the new stimulus, it is assumed that the baby is unable to perceive the new stimulus as different. The habituation-dishabituation paradigm has been used most extensively with studies of auditory and olfactory perception in infants. The second technique relies on evoked potentials, which are electrical brain responses that may be related to a particular stimulus because of where they originate. Changes in the electrical pattern of the brain indicate that the stimulus is getting through to the infant's central nervous system and eliciting some form of response.

另有两个研究婴儿感知的技术走进人们的视野。第一个就是习惯非习惯性技术靠的是观察一个单一的重复的对婴儿的刺激，直到婴儿对这一信号形成习惯并对信号的反应出现可测量的减弱（习惯性）。然后在一个新的刺激的出现时，任何对新刺激的反应的平复也都会被记录下来（非习惯性）。如果婴儿没有不习惯而是持续表示出对那些新刺激的习惯性，那么就可以假定婴儿没有办法识别出新的刺激有什么不同。这种习惯于非习惯的实验被广泛应用与听觉与嗅觉的婴儿感知研究上。另一种技术依靠唤醒潜能，脑电波的反应可能与特殊刺激的感受区相关联。改变大脑指示的电讯号可以让刺激通过中枢神经系统并且唤醒相应的反射区。

Each of the preceding techniques provides the researcher with evidence that the infant can detect or discriminate between stimuli. With these sophisticated observational assessment and electro physiological measures, we know that the neonate of only a few days is far more perceptive than previously suspected. However, these measures are only "indirect" indicators of the infant's perceptual abilities.

以上所说的每一种技术都可以给研究者提供关于婴儿能够探知或区别刺激的依

据，通过这些复杂的观察记录和电子生物学的探测，我们知道一个只有几天的新生儿能探知的要远比我们之前猜测的要多的多。然而，这些标准也只是通过“间接的”指示器所测量到的婴儿感知的能力。