

Infant Memory

Jenna Beffel, BS

Michigan State University

Naomi J. Aldrich, PhD

Grand Valley State University

Until the second half of the 20th century, the ability to recall information was thought to emerge between 2- and 10-years-of-age. Resulting from repression of our earliest sexual urges, immature neural mechanisms, or an impoverished sense of self and linguistic skills, *infantile amnesia* represents the predominant view of infancy at the time; a period in which the child possessed remarkably limited mental abilities, thus experiencing the world as nothing more than “one great blooming, buzzing confusion” (James, 1890). The research contributions of Dr. Carolyn Rovee-Collier over the next seventy years succeeded in altering this perspective.

Drawing upon 1- to 4-month-olds’ early exploratory behaviors (e.g., moving appealing objects; Flavell, 1963), and interest in auditory and visual changes (Rheingold et al., 1962; 1964), Rovee and then husband, David Rovee, examined the cognitive abilities of some of the youngest children tested to date. They did so using a new variant of operant conditioning, *conjugate reinforcement* (i.e., continuous reinforcement where reinforcement intensity depends on response rate; Lindsley, 1963), which had recently been used to successfully demonstrate learning in 1-year-olds. The seminal study of Rovee and Rovee (1969) included 9- to 12-week-old girls and boys participating at home in their own crib. A mobile was affixed to the crib, where brightly colored wooden figures dangled above the baby’s head, creating various patterns of auditory and visual stimuli when moved. Each infant participated in three phases during a 27-minute session: 1) 3-minute baseline period with an inactive mobile overhead, 2) after 2-minute

break, 15-minute learning acquisition period where the mobile moved, and 3) preceded by 2-minute break, 5-minute extinction period underneath a motionless mobile. Employing an experimental design, the key manipulation occurred during the acquisition phase, with response rate (average kicking of the left leg per minute) recorded throughout each phase. During the learning acquisition phase, the six children in the experimental group saw the mobile move only if they kicked as their left ankle was tied to the mobile with a soft, silk cord. In contrast, the 12 infants in the control group saw the mobile move due to experimenter manipulation: Six of these children wore a cord around their ankle that was not attached to the mobile, and the remaining six wore nothing around their ankle as the mobile moved.

Results indicated no difference in kicking rates between the two control groups who were unable to move the mobile themselves. In contrast, those who had the ability to move the mobile via their ankle cord displayed a significantly higher kicking rate during acquisition than those children whose cord was not attached. These infants in the experimental group also showed higher rates of kicking during learning acquisition compared to their baseline and extinction rates. With additional testing (10-minute re-acquisition, 2-minute break, 5-minute re-extinction after original extinction period) of four of these infants, the authors showed that infants learned to kick with reinforcement present (mobile figures moving with accompanying sounds), and subsequently stopped kicking when that behavior was no longer reinforced. For these four children, responses during each phase differed significantly from the preceding phase, with no differences between baseline, extinction, or re-extinction phases. These infants showed their highest response rates during acquisition and re-acquisition, tripling their kicking rates during the first 6-minutes of both phases.

Fundamentally, Rovee and Rovee (1969) showed that 9- to 12-week-old infants associated their own kicking with captivating patterns of sight and sound, demonstrating contingency relations in younger children than previously tested. Over the next decades, Rovee-Collier extended this research to infants' use of contextual cues for memory retrieval and retention (Rovee-Collier & Fagen, 1981). She also discovered similarities between infant and adult memory, with memory systems in place at birth instead of developing over the first-year-of-life as previously thought (Rovee-Collier, 1999). Along with numerous publications such as these, Rovee and Rovee (1969) provided a foundation for testing infants' cognitive abilities; now looked upon as the catalyst enabling psychologists to work towards understanding the complexities of our youngest participants. Due to these inquiries, as well as others' that followed, infancy is now considered a period of great competencies, as well as great change. The view of the incompetent infant has long since been dismissed; thanks not only to the babies who learned their mobiles moved on command, but also to the woman who took a chance that they could.

Further readings:

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