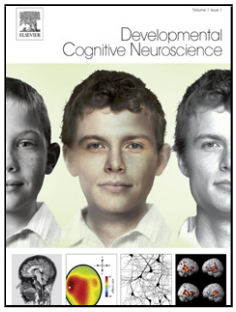

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Title:
Intact perceptual ability, but impaired familiarity judgment, after neonatal perirhinal lesions in rhesus macaques

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Abstract:

The perirhinal cortex is known to support high-level perceptual abilities as well as familiarity judgments that may affect recognition memory. We tested whether poor perceptual abilities or a loss of familiarity judgment contributed to the recognition memory impairments reported earlier in monkeys with PRh lesions received in infancy (Neo-PRh) (Weiss & Bachevalier, 2016; Zeamer et al., 2015). Perceptual abilities were assessed using a version of the Visual Paired Comparison task with black&white (B&W) stimuli, and familiarity judgments were assessed using the Constant Negative task requiring repeated familiarization exposures. Adult monkeys with Neo-PRh lesions were able to recognize B&W stimuli after short delays, suggesting that their perceptual abilities were within the range of control animals. However, the same Neo-PRh monkeys were slower to acquire the Constant Negative task, requiring more exposures to objects before judging them as familiar compared to control animals. Taken together, the data help to account for the differential patterns of functional compensation on previously reported recognition tasks following neonatal versus adult-onset PRh lesions, and provide further support to the view that the PRh is involved in familiarity processes.

Keywords: Recognition, Visual Perception, Medial Temporal Lobe, Development, Monkey

1 Introduction

The developmental consequences of early medial temporal lobe damage is of major clinical interest given the learning and memory deficits that are associated with many developmental neuropsychiatric disorders (e.g. schizophrenia, autism, ADHD, Fragile X, Down's and Williams syndromes). These disorders share common factors (developmental components, genetic predisposition, and medial temporal lobe pathology) with similarly impaired cognitive functions, but have different time courses and severity. Thus, a critical step towards creating effective interventions and treatments will require better understanding of the neural basis of perception, learning, and memory, and of the outcomes of early insult at different nodes along this network across development. Although a large body of work has linked structural and functional changes of the hippocampus to these disorders (for review see Machado & Bachevalier,