

The role of sleep in infants' novel category retention and generalisation to novel instances

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Introduction

A growing body of research suggests that sleep has an important role in consolidating newly learnt information and generalising this knowledge to novel instances (e.g. Djonlagic et al., 2009). The effects of sleep on early categorisation abilities haven't been investigated so far and thus the aim of this study is to examine the role of sleep in formation of category representations. Two experiments were conducted. Experiment 1 set out to determine 4-months-old infants' ability to form novel visual categories when category formation test immediately followed learning. Experiment 2 investigated the impact of sleep on consolidation of the newly learnt categories by testing for category formation after a 2 hours delay.

Methods

Both experiments employed eye-tracking familiarisation-novelty preference paradigm. In Experiment 1, infants were familiarised with a set of exemplars from a novel category. Immediately after the familiarisation phase, infants' category formation was tested by presenting two items simultaneously and their looking references were used as an index of category learning. Experiment 2 tested retention of the newly acquired categories by introducing a delay between the familiarisation and the test phase. Half of the participants took a nap during the delay, whereas the other half remained awake. Polysomnography was recorded using a standard PSG protocol for infants. Sleep stages were scored according to the guidelines of the AASM, and sleep spindles were detected using an adaptation of an existing algorithm for spindle detection in children.

Results and Conclusion

Results of the Experiment 1 revealed that infants were able to learn novel visual categories when category formation was tested immediately suggesting that infants are able to extract relevant information and generalise to novel instances. Preliminary results of Experiment 2 (data analysis ongoing) suggested that infants who napped performed better than infants who stayed awake during the interval.