Does the early social environment influence behavioural flexibility in cooperative breeding cichlids?

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To flexibly adapt one's behaviour to the current environmental conditions can be crucial for survival, reproductive success and social integration in group living animals. Flexibility has been widely demonstrated in the animal kingdom in both social and non-social contexts, but the factors driving variation in flexibility remain poorly understood. The early social environment is one important driver of variation in cognitive abilities and of flexibility in the social context. Here, we ask whether the early social environment also affects flexibility in a non-social context. We investigated this question in *Neolamprologus pulcher*, a cooperatively breeding cichlid living in stable social groups with division of labour. In this species non-social helping tasks are modulated by social behaviours; therefore, it is possible that the early social environment influences non-social flexibility later in life. To test this hypothesis, we compared the performance of individuals raised during their first two month of life either in large groups of 10 fish or small groups of three fish across three non-social flexibility tasks: innovation, reversal learning and set shifting. Flexibility in non-social contexts was demonstrated in all tasks, but there was no evidence for a long- term effect of the early social environment. While previous studies have demonstrated that developmental plasticity induced by the early social environment affects cognition in the social domain, these results suggest that early social experience does not affect the non-social domain likewise.

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