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Stereotypy, personality and environmental enrichment

Joshi, Sneha

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ABSTRACT

Animals in captivity are often raised in suboptimal environments, which lead to abnormal behaviours, such as stereotypic behaviour. Environmental enrichment can reduce or eliminate these behaviours to some extent. However, enrichments are not always successful in their intended purpose, which may be attributed to differences among individuals (i.e. personality). The overarching aim of my study was to investigate how environmental enrichment affected the expression of stereotypic behaviour in my study model, the African striped mouse, *Rhabdomys dilectus*, and to ascertain whether personality modulated the responses to enrichment. I conducted four experiments to test these aims. Firstly, I tested whether personality was associated with the development and expression of stereotypic behaviours. Results indicated that stereotypic striped mice were bold and showed a proactive coping style, while non-stereotypic striped mice were less bold and showed a reactive coping style. Furthermore, having a proactive coping style did not predict the onset of stereotypic behaviours. Nevertheless, individual differences in personality were observed even within stereotypic and non-stereotypic striped mice so that each group was not homogeneous for personality. Secondly, I tested whether personality was associated with the responses of stereotypic striped mice to enrichment. While stereotypic behaviours were reduced in enriched cages, individuals were not consistent in their behaviour, indicating flexible behavioural responses to the different cage complexities. Interestingly, these responses occurred irrespective of personality differences. There were no treatment-related differences in the behavioural responses of non-stereotypic striped mice. Thirdly, I examined whether the age at which striped mice were introduced to the environmental enrichment influenced their behavioural responses. Age did not affect the behavioural responses of stereotypic or non-stereotypic mice to the cages of different complexity. Surprisingly, while stereotypic behaviours were reduced in the enriched treatments, not all stereotypic mice responded to enrichment in the same manner, implying flexible behavioural responses. Moreover, these behavioural responses also occurred regardless of the individual's personality type. There were no age-related differences in the behavioural responses of non-stereotypic striped mice. Finally, I investigated the purpose of wheel running, either as an enrichment or as a re-directed stereotypic behaviour, in stereotypic striped mice, because there is much debate about its use as an enrichment. Due to individual differences in responses to the running wheel, wheel running appeared to be both an enrichment and a re-directed behaviour. In conclusion, my study

provides the first empirical data for the theory that stereotypic animals have different personalities to non-stereotypic animals. Nonetheless, this dichotomy between stereotypic and non-stereotypic striped mice at the group level masked individual responses within groups, with individuals flexibly altering their behaviour, depending on the environment to which they were exposed, which in turn affected the efficacy of environmental enrichment. My study suggests that the welfare and well-being of animals requires an assessment of individual trajectories in the development of stereotypic behaviours.