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www.ufaw.org.uk

Animal Welfare 2015, 24: 463-473
ISSN 0962-7286
doi: 10.7120/09627286.24.4.463

Stereotypic mice are aggressed by their cage-mates, and tend to be poor demonstrators in social learning tasks

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Abstract

Stereotypic behaviours (SBs) are linked with behavioural inflexibility and resemble symptoms of autism, suggesting that stereotypic animals could have autistic-like social impairments. SBs are also common in caged mice. We therefore hypothesised relationships between stereotypic and social behaviours, predicting that highly stereotypic mice would give/receive more agonism and be less effective in social learning tasks. Experiment One used C57BL/6 and DBA/2 mice in non-enriched or enriched housing (15 cages each); Experiment Two, more cages (six non-enriched, 44 enriched) plus a third strain (BALB/c). Across both experiments, enrichment reduced SB and agonism (aggression, plus 'displacements' where one mouse supplants another at a resource). These effects appeared related: housing effects on agonism became negligible when SB was statistically controlled for; and, at least in enriched cages, SB covaried with receiving aggression. In Experiment Three, 20 DBAs varying in SB from Experiment Two acted as demonstrators in a 'social transmission of food preferences' task. They were fed a novel flavour (shatavari powder), then each mingled with a familiar but flavour-naïve C57 observer. Observers were subsequently offered two novel flavours: shatavari or marjoram. Those spontaneously choosing more shatavari (n = 10) tended to have had less stereotypic demonstrators than the other ten observer mice. Overall, highly stereotypic mice thus received more agonism — an effect with obvious welfare implications that can be reduced with enrichment — and seemed potentially less effective at inducing flavour preferences in conspecifics. Such effects are consistent with social impairment, suggesting that reducing SB may perhaps enhance interactions between conspecifics.

Keywords: *aggression, animal welfare, environmental enrichment, mice, stereotypic behaviour, social learning*