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EFFECT OF ENVIRONMENTAL ENRICHMENT ON AGGRESSION IN BALB/CJ AND BALB/CBYJ MICE MONITORED BY USING AN AUTOMATED SYSTEM

Jareca M Giles,^{1,*} Julia W Whitaker,¹ Sheryl S Moy,² and Craig A Fletcher¹

¹ Division of Comparative Medicine and ²Carolina Institute for Developmental Disabilities and Department of Psychiatry, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina

BACKGROUND AND AIMS - Aggression among mice remains a common undesirable problem in laboratory settings, and animal welfare and scientific outcomes may become compromised depending on the severity of aggression. Enrichment can play a fundamental role to reduce and minimize aggressions between cage mates but the vastity of available solutions as well as the difficulty to objectively analyze the impact is huge.

MATERIAL AND METHODS - This study evaluated the effect of cage enrichment comprising a bilevel, mounted 'mezzanine' compared with a cotton square or shelter on intra-cage male aggression over a 6-wk period. high-aggression sub-strain (BALB/cJ) and low-aggression sub-strain (BALB/cByJ). Aggressive interactions and locomotor activity were scored manually and then compared with measures of activity obtained by using a continuous automated home-cage monitoring system, the Digital Ventilated Caging (DVC[®]) system.

RESULTS - BALB/cJ mice exhibited similar levels of aggression across housing conditions, whereas BALB/cByJ mice had lower aggression when housed with a mezzanine. In the second study, video recordings and continuous DVC automated measures were collected over 24 h and divided into 12-h light and dark phases. BALB/cByJ mice—but not BALB/cJ—mice had increased aggressive behaviors during the dark phase. However, the DVC detected higher activity levels during the dark phase, compared with the light phase, in both sub-strains. Elevated activity levels recorded by the DVC[®] correlated with fighting bouts and high levels of locomotion.

CONCLUSIONS - These results show that a bilevel structural form of enrichment reduces aggression, depending on the BALB/c sub-strain, and confirms higher aggression levels in the BALB/cJ sub-strain. In addition, our findings provide evidence that the DVC[®] is effective in identifying mouse cages with patterns of high activity levels, signaling possible aggression incidences, thus potentially allowing for early intervention and consequently improving animal welfare.