

In the photocell activity cages only one dose of dexamphetamine (2.36 mg/kg) and the mixture containing this ingredient dose significantly increased activity. Lithium pretreatment, however, failed to prevent these increases. This may have been because the activity cages provided a qualitatively different environment with little scope for the characteristically 'manic' hyperactivity observable on the holeboards, because the mice had already previously been tested, and because in any case photocells do not readily discriminate between various kinds of movement.

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Previous environment and responses to morphine

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Long-term isolation induces several biochemical, pharmacological and behavioural changes in mice and rats (Garattini, Giacolone & Valzelli, 1969; DeFeo, Baumel & Lal, 1970). We have found that 12 or 12.5 mg/kg intraperitoneally of morphine reduced the activity of male rats tested in Y-mazes (Rushton & Steinberg, 1963). Isolating rats for 40 days between weaning and testing counteracted these effects of morphine. Putting previously isolated rats into groups of 12 for 24 h before the test abolished the effect of isolation. However, 24 h of isolation of previously grouped rats did not alter the activity-reducing effects of morphine.

In contrast with these results, isolation for 40 days actually enhanced the analgesic effects of 8 mg/kg morphine which were measured in a 'tail-press' apparatus, using a struggle response as the measure of pain.

In chronic experiments, previously grouped or isolated rats did not differ in the rates at which they learned to self-administer solutions of morphine. The method used was similar to that described by Kumar, Steinberg & Stolerman (1968). The proportion of total fluid drunk in the form of morphine solutions when water was also available was taken as an index of dependence. Isolated and grouped rats made dependent on morphine by regular injections showed no differences in the amounts of weight lost after substitution of morphine by saline injections.

The apparent absence of effects of previous isolation in the chronic experiments may be due to disturbances associated with the experimental procedures, especially as the first experiment had shown that the effects of isolation were labile since they could be abolished by short periods of grouping. It is unlikely that the modification of acute responses to morphine was simply due to general changes in the rate of metabolism of the drug, since the two responses that were measured showed opposite results.

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