

## THE OPEN-FIELD: TEST OF EMOTIONALITY OR AN APPROACH-AVOIDANCE CONFLICT?

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Animals' reactions in the open-field test are usually explained in terms of emotionality, fearfulness, temperament, stress-susceptibility, exploration or coping style. We review the open-field test in different species. Locomotor activity in the open-field is often seen as the outcome of a one-factor process (Hall, 1934; Archer, 1973, Broadhurst, 1975, all references in this abstract cf. Ramos and Mormede, *Neur. Biobehav. Rev.* 22:33, 1998). However, an alternative multi-factor interpretation of the open-field test has also been suggested (a.o. Royce, 1977; Whimbey and Denenberg, 1967; Walsh and Cummins, 1976; Suarez and Gallup, 1981). The multi-factor interpretation of locomotor activity mostly centres around the dimensions of fear and exploration, both motivating the animal's activity in the open-field (Markel et al., 1989). Repeated testing is often done to separate locomotor activity based on fear or on exploration. This is achieved by extending the session or introducing a new stimulus (bucket, alarm bell). Carry-over effects, however, complicate interpretation. Koene (PhD thesis, 1988) showed by factor analysis that locomotor activity of rats on the first day in an open-field loads on a different factor than activity on subsequent days. The difference between the activity (e.g. line crossings) on day 1 and day 2 of the test varies consistently with the genetic and social background of subjects. It shows, furthermore, a consistent relation with speed of conflict resolution in an approach-avoidance conflict (reaching a goal with appetitive and aversive properties). The reviewed literature strongly supports the two-factorial interpretation of locomotor activity in an open-field. Some examples of repeated testing of rats, pigs and chicken in the open-field test are given to support the approach-avoidance interpretation. It is concluded that the open-field test must be done twice (preferable exactly 24 hours apart) for a correct interpretation of locomotor activity based on a two-factor approach-avoidance conflict.