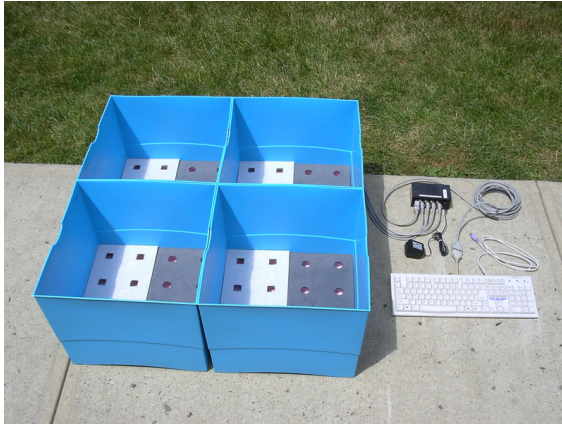


Evolocus

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Holeboard-based novel object recognition task

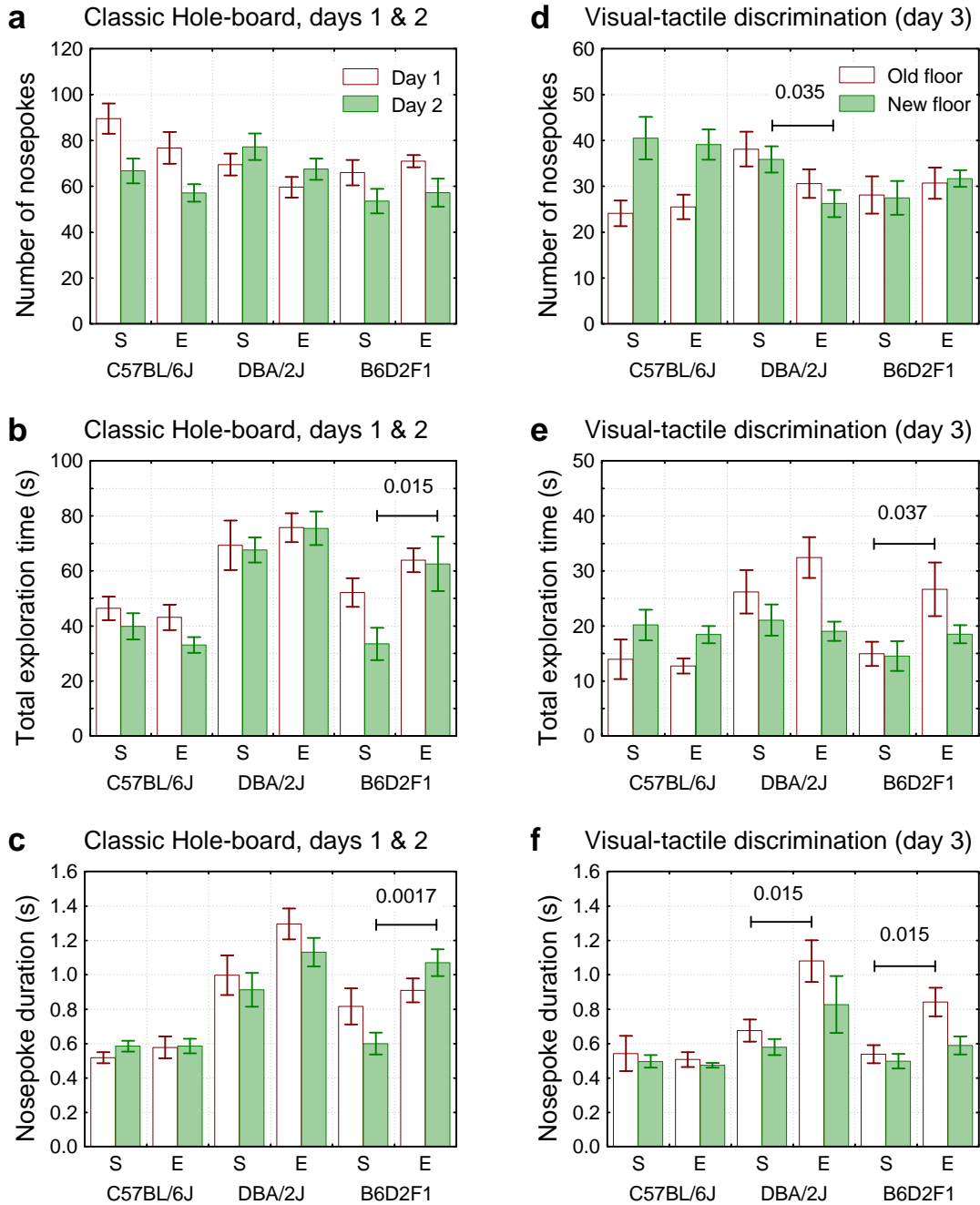
This system can be used with any known protocol of novel object recognition task. Here mouse can discriminate between holes in the floor with different shape (round, square, 6-point star, *etc.*) and/or between different floor materials.

Technically, device is recording nosepoke activity with a help of infrared beams under the floor. Typical system consists of 4 independent chambers (about 16" x 16" each) and 4 mice can be tested simultaneously. Our equipment is compatible with any video-tracking system that can accept events from standard PC keyboard. For example, it can send capital letter "A" at the beginning of a nosepoke and small letter "a" at its end.

Brief introduction into the history of Holeboard task

During the last 25 years Holeboard task has evolved from classic version with manual recording of mouse behavior towards modern computer-controlled system with infrared beams under the floor. Modern system can register duration of exploratory episodes to within 10 ms (using the same classic geometry with 16 holes ($d = 25$ mm) in the 40×40 cm arena, surrounded by vertical walls). In the classic Holeboard the single specific indicator of behavior was the number of nosepokes (for example, during 6-min session). In the modern setup it was discovered that two other indicators have better discriminative power: 1) "total exploration time" (this time is about 40-70 s for 6-min session) and, especially, 2) mean "nosepoke duration" (typical nosepoke duration is about 0.5-1.2 s). Contrary to straightforward logic, mean nosepoke duration can provide higher statistical significance than the number of nosepokes or total exploration time.

Our system was tested using C57BL/6J, DBA/2J and B6D2F1 female mice after standard and enriched housing conditions. Mice were taken from: Wolfer *et al.*, *Nature* **432**, 821-822 (2004). See the next page for results and the right photo for day 3 setup.



Visual-tactile discrimination of standard and enriched mice in the Hole-board task. **a-c**, Classic Hole-board, 6 min daily, days 1 & 2. **d-f**, Visual-tactile discrimination, 6 min (day 3). Number of nosepekes (**a, d**), total time of exploration (**b, e**) and averaged nosepoke duration (**c, f**). S, standard; E, enriched. Note the absence of enrichment effect in the number of nosepekes (**a**), and remarkable increase of nosepoke duration in the enriched hybrid B6D2F1 mice during the second day (**c**, green). Note the absence of enrichment effect in the exploration of new floor (**e-f**, green), but significant increase in nosepoke duration in the old floor in enriched DBA/2J and B6D2F1 (**f**, white). Mean \pm SE. Mann-Whitney U-test (8 mice in each group).