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Patterns of association among *Peromyscus leucopus* using artificial nest boxes during the fall

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After the breeding season, white-footed mice *(Peromyscus leucopus)* begin to nest communally at day refuge sites (Madison et al. 1984; Wolff and Durr 1986). The onset of communal nesting is generally preceeded by a move from arboreal nest sites to nest sites below-ground or low in trees (Madison et al. 1984). Although mean group sizes and sex composition of groups have been reported (Wolff and Durr 1986), it is not known whether lasting associations exist between individuals in communal nests. I investigated this aspect of *Peromyscus leucopus* social organization during the fall through the use of artificial nest boxes.

The study site was located in a mature, upland forest dominated by sugar maple *(Acer saccharum)*, white ash *(Fraxinus americana)*, American beech *(Fagus grandifolia)*, hophornbeam *(Ostrya virginiana)*, and shagbark hickory *(Carya ovata)*. Artificial nest boxes (12 × 12 × 12 cm with 2.5 cm opening on one side) were placed 1 to 2 m high on the nearest tree to a grid point in a 9 by 9 grid with 10 m between grid points (0.64 ha area). Nest boxes were placed at the site the week of 18 October 1987 and were first checked the week of 1 November 1987. Wood chips and sawdust was provided in each box for bedding. Nest boxes were checked between 0800 and 1200 CST, one to two times a week (12 times in all), until the last week in December. At the end of December, use of the nest boxes as day refuges ceased as the mice presumably moved to below ground sites. Each time the nest boxes were checked the identity of each individual was noted. On first capture, each individual was toe-clipped, sexed, and aged, based on pelage coloration, as either an adult or subadult. Mice captured at least twice were considered to be resident on the study grid.

A total of 23 mice were captured 72 times. Eighteen mice (nine adults, nine subadults) were resident on the study grid. The most common groupings in order of occurrence were: adult male and female (10 times); lone adult male (9); lone adult female (7); lone subadult male (6); adult male, adult female and mixed sex subadult group (3); adult female with mixed sex subadult group (3); and mixed sex subadult group (2). In addition, the following groups were each captured once; lone subadult female, adult male with subadult female, and two subadult males. Mean group size was 1.95 (SD = 1.18, range 1–5).

The nine resident adults were captured 43 times. Based on their patterns of association adults could be divided into two groups; those that rarely associated with other adults and those that were frequently associated with another adult. Five of the adults (three males, two females) were typically found either alone or with subadults. In only one case was an adult male-female group found. In contrast, the other four adults were typically caught as male-female pairs. One male and female were found seven times each and in each instance they were together (twice they were also associated with subadults). Another pair was trapped together five times. These two individuals were never found with other adults, although the female was found alone once.

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The nine resident subadults (five males, four females) were captured only 24 times. Because of the low recapture rate, only four subadults were recaptured two or more times in communal nests, so it was difficult to determine if subadults maintained long-term associations. There were two cases of a subadult being found twice with the same adult female. In another case, two subadults (a male and female) were found together on three occasions. These associations may represent mother-offspring or sibling relationships (Wolff and Durr 1986).

Of the 49 recaptures, 13 occurred in the same nest box as the original one, 26 occurred in adjacent boxes, and 9 recaptures were made in boxes two grid points away. Only one recapture occurred more than two grid points away from the original capture site. Captures were made at 21 different nest boxes. These boxes were used by a mean of 1.95 different individuals (SD = 1.2, range 1–5). When only nest boxes at which residents were captured are considered, a mean of 2.3 individuals used each box.

It has been suggested that communal nesting among rodents during the winter may be advantageous for conserving heat by huddling, gaining access to limited nest sites, or for avoiding predation (West and Dublin 1984). None of these potential advantages, however, require long-term associations between individuals. The results of this study suggest that some, but not all, adults maintain an association with an individual of the opposite sex in terms of their use of day refuges. Further research is needed to determine if these pairings are simply non-breeding season associations or if they also represent breeding pairs. *Peromyscus leucopus* is reportedly promiscuous (Wolff and Lundy 1985), so it is unlikely that these pairings represent strictly monogamous relationships.

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