

SEX AND AGE DIFFERENCES IN RISK-TAKING BEHAVIOR IN HOUSE SPARROWS¹

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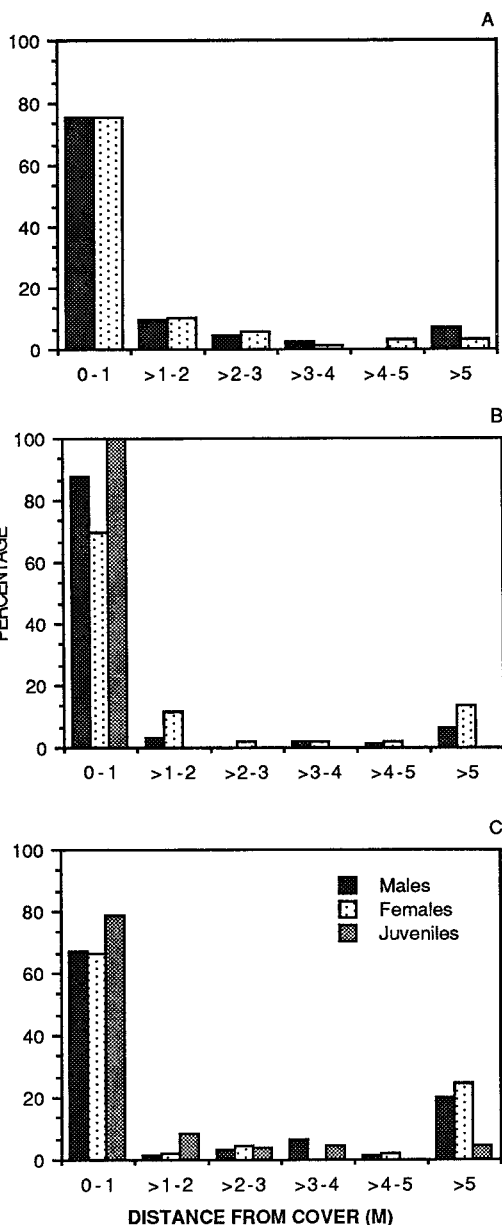
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Few data are available on sex and age differences in risk-taking behavior of most avian species. Caraco and Bayham (1982) reported that male House Sparrows (*Passer domesticus*) occurred in flocks in greater proportion than females and suggested that females may be more reluctant to feed in a frequently disturbed area. Later, Breitwisch and Hudak (1989) found that male, rather than female, House Sparrows were last to leave a seed patch when disturbed. However, both these studies were of wintering sparrows. No study has examined sex and age differences in risk-taking behavior in House Sparrows during the breeding season.

I investigated risk-taking behavior of House Sparrows between May and July 1990 so as to determine whether different categories (males, females, and juveniles) of House Sparrows differ in distribution in relation to cover and whether such differences change with time. I assumed that increased distance from cover increases vulnerability to predation (Pulliam and Mills 1977, Barnard 1980, Caraco et al. 1980) because the most frequent escape tactic of House Sparrows is to take cover when attacked by a predator (Barnard 1979, pers. observ.). I also assumed uniform distribution of food quantity and quality for House Sparrows at different distances from cover.

Six 1-km transects were randomly selected in Saskatoon, Saskatchewan, Canada (52°07'N, 106°38'W). The study area has been described elsewhere (War-



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FIGURE 1. Percentage of male, female, and juvenile House Sparrows at different distances from cover in May (A), June (B), and July (C) 1990. Frequency distribution of each category of House Sparrows was calculated separately for each month. Sample sizes: May = 238 (males—153, females—85), June = 212 (males—97, females—59, juveniles—56), and July = 305 (males—61, females—55, juveniles—189).

kentin and James 1988). Each transect was surveyed by foot every 15 days, i.e., twice a month between May and July 1990. Twenty-five minutes were spent (determined by preliminary surveys of two transects in early May 1990) surveying 30 m on both sides of each transect within the first four daylight hours of fair weather (<10% cloud cover, <15 km/hr wind speed). Individual House Sparrows (both solitary and in flocks) were visually located, identified as males, females, or juveniles, and distance from cover when first sighted was also recorded for each individual.

Juveniles were identified as having yellowish hinges on the beaks, yellowish legs and plumage (Summers-Smith 1963). The juveniles exhibit these characters up to 4–6 weeks after fledging, after which they are difficult to distinguish from the adult females (Summers-Smith 1963). House Sparrows start breeding in Saskatoon in early April, but fledging peaks in mid June and then mid July (P. C. James, pers. comm.). This suggests that in July the number of female House Sparrows recorded may be slightly inflated. However, this would not seriously bias my results because juveniles as well as females in July occur at almost every distance from cover (Fig. 1).

Every month, proportionally more individuals of all three categories of the House Sparrow were in or near than away from cover (Fig. 1). It has been suggested that passerines out of cover are more vulnerable to predation (Barnard 1979, Lima 1990, Watts 1990, Sodhi 1991). The distribution of different categories of House Sparrows in relation to cover did not differ significantly either in May ($G = 8$, $df = 5$, $P > 0.10$; Fig. 1A; raw counts were used for G -tests) or in June ($G = 10$, $df = 5$, $0.05 < P < 0.10$; Fig. 1B). All juveniles in June were recorded in or near cover (Fig. 1B). During July, distribution of males, females, and juveniles in relation to cover differed significantly ($G = 33$, $df = 5$, $P < 0.001$; Fig. 1C). Juveniles were encountered at almost every distance from cover in July, but relatively more juveniles than adults were close to cover (Fig. 1C).

More juveniles came out of cover in July compared to none recorded at more than one meter from cover in June. Perhaps as juveniles age they become more experienced at predator detection and evasion and thus are able to venture farther away from cover.

In summary, it appears that sexes of the House Sparrow do not differ significantly in cover use during most of the breeding season. Relatively more juveniles than adults were recorded in or close to cover. Perhaps juveniles are more vulnerable to predation away from cover than adults. House Sparrows form about 65% (by number) of the breeding-season diet of Merlins (*Falco columbarius*) in the study area (Oliphant and

McTaggart 1977, Sodhi et al. 1990). By identifying prey remains collected near 65 Merlin nests between May and July (1987–1990) in Saskatoon, I found that Merlins increasingly take juveniles rather than adult House Sparrows from May to July (unpubl. data). Similarly, Watts (1990) noted earlier that relatively fewer Song Sparrows (*Melospiza melodia*) than Savannah Sparrows (*Passerculus sandwichensis*) were outside cover because Song Sparrows are more vulnerable to predation outside cover.

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