The structure, context and functions of group singing in black-breasted wood-quail
(Odontophorus leucolaemus)

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Summary
Black-breasted wood-quail (Odontophorus leucolaemus) are vocal, group living birds (covey size ranges from 2 to 15 individuals) that inhabit the dense understory of highland forest in Costa Rica. Mated pairs produce coordinated duets and groups produce coordinated choruses that are audible to humans from a distance of at least 200 m. Duets and choruses are antiphonal; they consist of two syllables that are comprised of two elements each, which are repeated over and over in an alternating fashion. Neighbouring coveys are most often heard calling back and forth just after dawn and all group members participate in singing and territory defence. During territorial encounters, group singing is often accompanied by displays, chases, and even physical fights between members of opposing coveys. Black-breasted wood-quail produce at least five structurally distinct close-range calls that are associated with within-group communication and territorial encounters. Observations of the context of unprovoked duets and choruses, in addition to responses to simulated territorial intrusion using playback, indicate that these songs play an important role in territory advertisement and defence. Furthermore, black-breasted wood-quail may adjust their response to playback as a function of relative group size, suggesting that choruses could function in relative numerical assessment of group size.

Keywords: duet, chorus, Odontophorus leucolaemus, territoriality, wood-quail.

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Introduction

Avian duetting usually refers to joint acoustic displays in which two birds coordinate their songs by overlapping or alternating notes with a degree of temporal precision (Farabaugh, 1982; Langmore, 2002). Reviews of duetting indicate that this behaviour is consistently associated with prolonged monogamous pair bonds and year-round territoriality (Thorpe, 1972; Farabaugh, 1982). Despite the many hypotheses as to its function, including joint territory defence, pair bond maintenance, acoustic mate guarding, and mate attraction, it remains unclear why some species coordinate their songs and others do not (reviewed in Hall, 2004), and whether duetting is primarily a cooperative behaviour or whether it signals conflict between the sexes (e.g., Levin, 1996; Grafe & Bitz, 2004). Chorusing, the production of coordinated vocal displays by more than two individuals in group living birds and mammals, has received less attention than duetting, but it is likely to have functions that are similar to duets. There is good evidence that chorusing is involved in the collaborative maintenance of territories (e.g., laughing kookaburras, Dacelo novaeguineae, Reyer & Schmidl, 1988; Baker, 2004; Australian magpies, Gymnorhina tibicen, Brown & Farabaugh, 1991; white-browed sparrow-weavers, Plocepasser mahali, Wingfield & Lewis, 1993; female lions, Panthera leo, McComb et al., 1994; subdesert mesites, Monias benschi, Seddon, 2002). Chorusing is also likely to function in intra-group cohesion (Payne, 1971; Brown et al., 1988) and the establishment and maintenance of dominance hierarchies among group members (Reyer & Schmidl, 1988). Both choruses and duets can have multiple functions within a species (e.g., Brown & Farabaugh, 1991; Seddon, 2002).

The Odontophorus quail are unique among the Gallinaceous birds in that they appear to associate in small groups called coveys year-round, defending all-purpose group territories (Skutch, 1947; Stiles & Skutch, 1989; Carroll, 1994). These ‘wood-quail’ are found in tropical to subtropical forest in Mexico and Central and South America, and many species are threatened due to habitat loss and hunting (Carroll, 1994; Collar et al., 1994; Fuller et al., 2000). Group singing is found in a number of wood-quail and antiphonal duetting is probably widespread throughout the genus (Skutch, 1947; Stiles & Skutch, 1989; Carroll, 1994; Bonaccorso, 2000). Although recordings of choruses have been used for population surveys (Carroll, 1997; Bonaccorso & Barreto, 2002; Hale, 2006), vocal communication in wood-quail has re-