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Aspects of play behaviour of vicuña, *Vicugna vicugna*

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Abstract

Calves and yearling vicuñas (*Vicugna vicugna*) were observed in the INTA-Abrapampa, Jujuy, Argentina. Vicuñas played more early in the morning and late afternoon, and generally play behaviour was performed between two animals belonging to the same family. About 20% of playing included calves from different families. Fighting-playing was the most frequent type of play. Yearlings only performed fighting-playing and played for longer periods than calves. Calves less than 2-wk old played principally as locomotor play. Results are discussed in relation to the idea of playing as a non-homogeneous behavioural category.

Keywords: Vicuñas; *Vicugna vicugna*; Play behaviour; Argentina

1. Introduction

First social experiences of young mammals with individuals other than their mothers include play behaviour (Byers, 1984). Play consists of emergency-type behaviour (fight, flight, predation, copulation) which appears outside its normal functional context, and may be structurally altered according to Loizos (1966) and Aldis (1975) cited by Barber (1991). Suggested benefits of playing include motor training, the establishment of social relations and, as a promoter of adaptative energy loss, an antipredator strategy (Barber, 1991). Play is not a unitary behavioural category in terms of development and causation (Bateson, 1981; Gomendio, 1988). This is particularly apparent when dividing play into different types, since some types appear at an early age but gradually disappear, while others appear at an older age (Gomendio, 1988).

Vicuñas (*Vicugna vicugna*) are wild camelid that

live in the Puna area of South America (Koford, 1957). Social organization of the species is based on family groups and bachelor groups (Koford, 1957; Franklin, 1974). The territorial male defends areas that are stable in placement and time (Koford, 1957; Franklin, 1983). They chase other territorial males, bachelors and also females approaching their boundary (Franklin, 1983). The mean composition of families (using data from different populations) is one male, three to four females and two calves (Vilá and Roig, 1992). Vicuña calves live with their mothers in family groups until 6 and 12 mo, depending on the sex of the calf (Koford, 1957; Franklin, 1983; Glade and Cattán, 1987). The mother-offspring pair, as other 'followers' species, has an initially short distance between the members gradually increasing with time (Vilá, 1992b). Mothers have one calf per year (Koford, 1957; Franklin, 1983) and tend to be aggressive with alien calves (Vilá, 1992a).

Play behaviour in vicuñas was first described, as most of the important behaviours of this species, by the extensive, qualitative paper of Koford (1957). In recent papers this behaviour has not been studied in

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detail. Bosch (1984) showed that the time which calves allocated to play was 0.8%; Glade and Cattani (1987) in Lauca (Chile) found a similar result of 0.6%, which decreased with age of the calf. The objective of this paper was to give some description of play behaviour of vicuñas in the Puna region INTA-Abrapampa, NW Argentina.

2. Methods

This work was carried out from 14 March to 12 April 1989, in the Abrapampa Field Station of the National Institute of Agricultural Technology (INTA). The station is located in the Puna ecosystem of Jujuy Province, NW Argentina (3500 m above sea level). The vicuña stock of the station comprised approx. 600 animals living in four fields (approx. 100 ha each). The area has natural pasture and water availability. Whilst animals were protected, invasive management was minimal so as to maintain their natural wild social organization (family and bachelor groups) and behaviour. For an extensive description of the area see Vilá (1992a).

Observations were made from an observation hut. The families under view were those in closest proximity to the observation hut ($n=6$). The composition of these families was (male/females/yearlings/calves): 1:6:1:4, 1:4:0:2, 1:3:1:1, 1:4:0:2, 1:5:0:3, 1:1:0:1. Thus, there were 13 calves under view. Calves could not be sexed. As birth season is synchronized, most of the calves were under 2 months of age. Yearlings in bachelor groups were also observed when bachelor groups were near the observation hut.

Daily observations included days with two observation periods 'long' (4 h early in the morning and 3 h late afternoon), and days with one observation period 'short' (5 h of observation from late morning to early afternoon). Due to electrical storms and climatic conditions, a mean of 5.12 (SD=1.8) observation h/d were recorded in 20 days of observation distributed in a month. The area was constantly observed and any time 'play behaviour' (with the definition above) occurred, a 'focal sample' (Altmann, 1974) was made. Data recorded included: (a) age (calves: under 2-wk old, older than 2 weeks and yearlings); (b) number of animals involved and the families they belong to; and

(c) type of playing behaviour performed and time and date were registered.

Four different types of play behaviour were recorded: (1) Nursing-playing: attempts to suckle; (2) Sexual-playing: walking from the back, attempts to mount; (3) Locomotor-playing: short runs, fast stops and turns, runs with jumps; (4) Fighting-playing: aggressive patterns such as spits, chest to chest frontal clash, neck wrestle and leg bites.

3. Results

Fifty-four occurrences of 'playing' were recorded. Play had a bimodal distribution during daylight hours. The probability of observing a play bout/h was 1.13 early in the morning (08:30–09:30), decreased as the day went by (probability/h at 12:30=0.08) and increased again in the afternoon to 1 bout per h at 17:30 (fit to a polynomial curve $r^2=0.87$).

Most of the 'playing interactions' involved two calves (Fig. 1). Playing commonly occurred between family calves, but it was not rare to have groups of several calves from neighbour families lying and playing together. About 20% of the records included calves belonging to different families from two ($n=5$) and three ($n=2$) neighbour families.

Locomotor play was performed in 83% of its occurrence by less than 2-wk-old calves and only this age class played 'alone' ($n=4$ locomotory play without

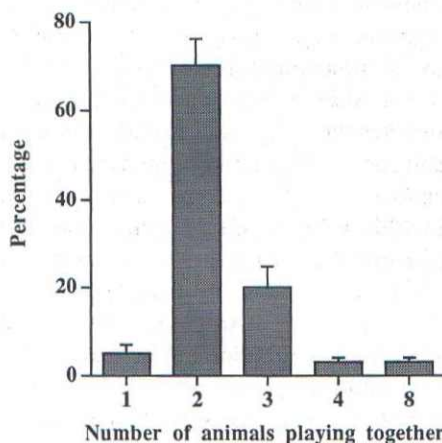


Fig. 1. Percentage distribution and SE of occurrences of play behaviour in relation with number of calves involved.

partner). Yearling playing bouts were 11% of the total recorded, as they only played fighting between two animals.

Duration of play also differed between calves and yearlings with calves playing with a mean duration of 2.50 min (SE=0.38) and yearlings 8.83 min (SE=0.7) (Student's $t=7.9$ $df=52$, $P<0.001$).

4. Discussion

Vicuña calves playing patterns were similar to other ungulates described by Byers (1984). As in other ungulates, although less than 1% of their time is spent playing, it is an important activity for vicuñas in relation to energy availability in the Puna. Bekoff and Byers (1992) discussed the importance of playing, although being a short duration activity. Vicuñas principally played in dyads. As the main vicuña family consists of one male, three to four females and two calves, this means that calves usually played with their half brother/sister (the probability of being fathered by the same male is high in vicuñas). When the number of 'players' increased they usually had different family members in the group. Although males defended their areas vigorously against other males and females, calves seemed to move freely between families. Territorial males smelled calves trespassing and did not chase them. This fact has been described for other vicuña populations (Koford, 1957; Menard, 1982). Females were the most aggressive against 0-3-mo-old calves from neighbouring families, particularly when they were playing near them (Vilá, 1992b).

Three results found in this study were very similar as Gomendio (1988) described for *Gazella cuvieri*. These were: (1) only the very small vicuñas played locomotor play; (2) only the small played alone; and (3) older calves played fighting most of their playing time.

Fight-playing was observed in yearlings belonging to bachelor groups. This can be compared with the 'playfight' in class 1 (10-15-mo old) calves described for guanacos *Lama guanicoe* bachelor groups (Wilson and Franklin, 1985). They pointed out that yearling play-fight interactions had no clear outcome, due to the fact that the interaction was play. Within bachelor groups playfight only involved young animals, while

direct aggressive displays involved older ones (Wilson and Franklin, 1985).

There has been a change in previous explanations about play behaviour. Playing had been considered to have immediate costs and postponed benefits (Fagen, 1981). Against that explanation, play can be viewed as an activity that has immediate benefits (Bateson, 1981; Gomendio, 1988). This explanation is based on the concept that selective forces operate at all stages of life, and the fact that there are different types of play that occur in different ages of calves (Gomendio, 1988), as was found in this work on vicuñas. Although a long-term project with individualized calves is the next stage, these data support the latter hypothesis. This is particularly apparent in the locomotor play (with some calves playing alone) within very young calves and the fighting play in older calves and yearlings.

As regards the immediate benefits of playing, a recent paper by Barber (1991) has explored some benefits of playing. Play (particularly locomotor play) is proposed to promote adaptive energy loss and to be a heat producer. Crowell-Davies et al. (1987) found that ponies (*Equus caballus*) played more when the temperature was low. A similar result was found in this work with vicuñas mainly playing early in the morning and the afternoon. Also, Koford (1957) found that calves played more in late afternoon in Perú.

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Resúmen

Vilá, B.L., 1994. Aspectos del comportamiento de juego en vicuñas (*Vicugna vicugna*). *Small Rumin Res.*, 14: 245–248.

En este trabajo se describe el juego en vicuñas. Crias y juveniles de un año fueron observados en INTA-Abrapampa, Provincia de Jujuy, NO Argentina. Los animales tendieron a jugar mas, temprano a la mañana y en el atardecer y en duplas pertenecientes a la misma familia. Aproximadamente el 20% del juego incluyó crias de familias diferentes. El juego-peleando fue el tipo mas frecuente de juego. Los juveniles sólo jugaron peleando y por mas tiempo que las crias. Las crias menores de dos semanas principalmente jugaron juego locomotor. Los resultados se analizan bajo la perspectiva del juego como una categoría comportamental no homogénea.