

Topic Summary – Cooperative Infant Care Behaviour
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ZOOLOGY 567

Tamarin monkeys are part of Callitrichidae, a family of New World monkeys. Callitrichids have a cooperative breeding system where a group generally consists of one breeding female, two or more adult males, one or more nonbreeding adult females, juveniles, and infants (Erb & Porter, 2020). A common trait among the callitrichids is the frequent birth of twins and large infants (Price, 1992a; Piper et al., 2017; Savage et al., 2021). Breeding females require assistance because infant rearing is costly due to lactation demands and their ability to conceive soon after postpartum (Zahed et al., 2010). Cooperative infant care is a behaviour performed by breeding males and nonbreeders, who are referred to as alloparents or helpers (Tardif et al., 1992). Alloparents perform actions like infant carrying, food sharing, group defence, and vigilance (Erb & Porter, 2017).

Researchers aimed to examine the potential benefits gained by alloparents (Price, 1992a; Erb & Porter 2020). Price (1992a) and Erb & Porter (2020) believed that cooperative infant care behaviour existed because breeders and nonbreeders may benefit. Through focal and instantaneous sampling of captive groups, carrying rates and food sharing were recorded to determine the amount of infant care provided (Price, 1992a). Results suggested that nonbreeders may gain parenting experience, develop bonds with the infant, and may increase tolerance from group members (Price, 1992a). For breeders, the energetic costs of infant rearing may be reduced, and infant survival may be increased (Price, 1992b). Researchers have suggested wild studies with larger samples to make significant conclusions in the future (Price, 1992a; Erb & Porter 2020).

Researchers investigated the influence of factors including age, sex, and group size and composition on the variation in infant care behaviour (Tardif et al., 1992; Zahed et al., 2010; Erb & Porter, 2017). Focal and instantaneous sampling was used to record infant care behaviours (carrying, food sharing, and infant rejection), and individuals were marked to keep track of age and sex (Tardif et al., 1992; Zahed et al., 2010; Erb & Porter, 2017). Studies suggested that age results in variation in the amount of contribution to infant care (Erb & Porter, 2017). Group size had conflicting results as wild studies found that it may influence helping behaviour because larger groups had more helpers, therefore reducing the contribution required by each individual (Erb & Porter, 2017). However, captive studies found that group size did not influence the behaviour (Savage et al., 2021). Group composition may influence infant care behaviour as groups with more adults, specifically adult males, displayed increased infant carrying and survival (Erb & Porter, 2020; Piper et al., 2017). Overall, evidence from captive and wild studies demonstrated that individuals vary in their contribution to infant care because of the balancing act between the costs and benefits of helping and the factors examined that influence those potential costs and benefits (Erb & Porter, 2020; Zahed et al., 2010). The contradicting results between captive and wild studies can be mediated with wild studies containing larger samples

sizes as wild groups allow for more accurate interpretations of this behaviour (Erb & Porter, 2017).

Erb & Porter (2017) and Díaz-Muñoz (2016) studied the evolutionary theories behind cooperative infant care behaviour through systematic reviews of multiple studies. Erb & Porter (2017) examined the cooperative breeding hypothesis (CBE), which assumes mothers have evolved in groups containing alloparents as it results in decreased costs for infant care and increases infant survival. Further, infants in these groups may develop increased social behaviour if they are able to solicit care from alloparents (Erb & Porter, 2017). Current studies are limited and lack significant results on this hypothesis, so researchers have suggested future studies to direct more focus on the CBE (Erb & Porter, 2017). Díaz-Muñoz (2016) predicted that infant care costs (determined by infant weight and home range size) would determine the amount of infant care provided. Results from tamarin monkeys demonstrated that high costs result in groups containing multiple males mating and providing infant care, suppression of breeding in subordinate females, increased natal dispersal, and increased reproduction by the dominant female (Díaz-Muñoz, 2016). These results may suggest that individuals within the group are attempting to balance cooperation with the benefits they may gain (Díaz-Muñoz, 2016).

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