

# **Growing up Actively and Socially: Early Social Interactions with Non-Mother Individuals in Wild Japanese Macaques in Yakushima**

**Boyun Lee**

## **Introduction**

Infants interact not only with their mothers but also with individuals other than their mothers. Infant interactions with non-mother individuals have been discussed across various primate species, but there has been little focus on the infants. Previous explanations for infant interactions mostly center on the mothers or infants' social partners. Yakushima macaques (*Macaca fuscata yakui*), one of the tolerant populations of Japanese macaques (*Macaca fuscata*), are a good model for studying infant interactions with non-mother individuals and their active engagement in these interactions. Despite their nepotism and linear rank system, they exhibit greater within-group tolerance. Given maternal tolerance for other group members interacting with their infants, infant interactions are expected to be frequent, with infants being socially active away from their mothers. Based on current understanding on social development and Yakushima macaques, this thesis aims to reveal how infants are exposed to and integrate into the society through interactions with individuals other than their mothers, and how they actively engage in these interactions.

## **Methods**

To reveal patterns of social behaviors between infants and their non-mother social partners, I observed infant macaques from a troop of wild Yakushima macaque inhabiting the western lowland forest of Yakushima Island. Using focal and all-occurrence sampling, I collected behavioral data on infant interactions with non-mother social partners, including both the partners' behaviors and infants' behaviors directed toward their partners.

## **Results and Discussion**

My findings revealed that excessive infant handling, i.e., persistent infant handling despite infants' negative reactions, was performed for social bridging with higher-ranking partners, involving a strategy of selecting accessible infants and maternal tolerance as proximate mechanisms. This result suggests that strong natal attraction reflects less despotic relationships among females.

Additionally, I found that infants exhibit discriminative reactions based not only on handlers' rough behaviors but also on their familiarity, even in the earliest stages of life. Infants tend to avoid unfamiliar individuals and show intolerance toward their rough behaviors. At the same time, in interactions with familiar individuals, infants may expect help from their mothers or actively express their negative state through crying.

Lastly, the social partners that infants chose and interacted with tended to transition towards kin within the first year of life: increased preference for kin higher-ranking females as shelter; rejection and aggression from kin lower-ranking females; grooming with kin peers, and interactions with male juveniles based on maternal kinship. These shifts imply that infant social relationships become more kin-biased, resembling those of adults or those typical in the society.

## **Conclusion**

Across the three chapters of this thesis, I revealed how infants are exposed to and integrate into the society through interactions with individuals other than their mothers, and how they actively engage in these interactions. These findings may contribute to the discussion on the relationship between social structure and social development. Additionally, this study provides a perspective on infants as active social agents rather than merely tools for adult relationships or passive recipients of social behaviors.