

## 科学研究費助成事業 研究成果報告書

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研究成果の概要(和文)：I reviewed the existing literature for behaviors reported as potential traditions. We identified a total of 37 individual behavioral traditions. I will submit a paper for publication in a peer-reviewed journal and will present the findings at an International Conference in August.

研究成果の概要(英文)：For the literature survey, I categorized potential traditions into food (foraging/processing; food choice) and non-food related (social/communicative, comfort/hygiene; other). Each possible tradition as then further categorized according to human influence: directly influenced; indirectly influenced; or unrelated to human influence. I found that at least half of the potential traditions reported in the literature were related to human influence. Delineating traditions in wild and free-ranging monkeys may help us to better understand the phylogenetic origins of human culture. I also visited 10 different field sites to make contacts with researchers and observe potential traditions directly. Photographs and videos will be used to create an open-access website. In the future, I will publish the results of a questionnaire survey - to assess variation across sites.

研究分野：Biological Sciences Psychology

キーワード：culture traditions Japanese macaques Macaca fuscata intergroup variation intraspecific variation social learning literature survey

## 1. 研究開始当初の背景

### **Behavioral Traditions vs. Complex Patterns of Cultural Variation**

It was once thought that only humans have culture. A huge amount of evidence has now accumulated for traditions in nonhuman animals, notably nonhuman primates. Apes and monkeys (primates) are the closest living link to our evolutionary roots. For this reason, investigating traditions in monkeys helps us to better understand origins of human culture. In most cases, published reports for a single species concern a single behavioral variant, sometimes a few, but nothing like the complex pattern of variation in multiple traditions, of many different types, shown between human populations. The aim of my proposed systematic survey is to reveal such a complex pattern of variation between Japanese macaque populations, if the pattern exists.

### **What defines a behavioral tradition? How can be persuaded a particular behavior is a tradition?**

A tradition, as defined by cultural primatologists, is a behavior shown by individuals in some groups, but not in other groups of the same species, and that appears to be learned from others (socially learned), i.e. cannot be explained only by genetic or ecological factors. It is difficult to verify if particular behavioral variant is a true tradition.

### **Japan, Japanese macaques and traditions**

A huge amount of evidence has now accumulated for traditions in nonhuman animals, particularly nonhuman primates. Behaviours seen in free-ranging Japanese macaques were among the first potential traditions reported for any nonhuman animal, most notably 'sweet potato washing' and 'wheat placer mining' on Koshima Island, Japan. Numerous possible cultural variants have since been reported for this species, sometimes in Japanese only. Multiple long-term research sites have been subject to decades of detailed observation

### **Cultural Variation**

Despite early interest in and recognition of

'protocultural' behaviors in Japanese monkeys, it was for chimpanzees that the first survey of the complex patterns of multiple, single potential traditions across multiple field sites was published in *Nature* (Whiten et al., 1999), now considered a seminal paper.

If a complex pattern of absence and presence of habitual traditions (unexplained by ecological factors) of multiple potential behavioral traditions is revealed by the survey, a pattern closer to the array of cultural variation found in chimpanzees and in humans, it would have important implications for the evolution of human cultural variation.

## 2. 研究の目的

This study was aimed at providing a better understanding of culture variation in Japanese macaques, with implications for the evolution of human culture. Through systematic survey, I aimed to elucidate extant patterns of occurrence of multiple traditions among populations of this species across Japan.

The purpose of the study was, first, to carry out a literature survey to quantify and categorise potential traditions in Japanese macaques. The literature survey is the first comprehensive review of potential traditions in Japanese macaques, disseminating internationally the breadth of traditions in this monkey, native to Japan. Second, to observe the potential traditional behaviors first-hand, where possible, and to document them. Third, this preliminary study will provide the basis for a future questionnaire survey across researchers at the different sites, in order to create a clear 'map' of the pattern of presence and absence of a comprehensive list of candidate behaviors.

## 3. 研究の方法

I carried out a review of existing published literature (in both Japanese and English) over the last 65 years to identify every reported potential behavioral tradition in Japanese macaques. It is important that the international academic community be aware of potential traditions reported only

in Japanese.

I personally visited 10 different field sites across Japan where studies of Japanese macaques have been carried out: Arashiyama, Jigokudani, Koshima, Awajishima, Shodoshima, Takasakiyama, Yakushima, Kinkazan Island, Shimokita Peninsula and Minoh. I observed a huge variety of different potential traditions, documenting them as photographs and video.

These media records have been used in conference presentations and will also be used as the basis for a website on traditions in Japanese macaques. They will be used for a future questionnaire, extending the current work. I have built up a network of contacts: people across Japan who have carried out long-term research at different sites, and I will be able to publish the results of the questionnaire survey in the future as a result of this grant.

#### 4. 研究成果

I reviewed the existing literature for behaviors reported as potential traditions. I categorised potential traditions into food (foraging/processing behaviour or food choice) and non-food related (social/communicative, comfort/hygiene or other) behaviours. We further categorised each as either: directly related, indirectly related or unrelated to human influence, including provisioning. Prevalence was categorised, at the time of report, as customary, habitual or unknown within each site and named group.

I identified a total of 37 potential behavioural traditions from the existing literature: 17 related, and 20 apparently unrelated to human influence. We could not determine the pattern of variation across all sites for each behaviour because cross-site comparisons were mostly limited to a few populations (with exceptions: stone handling, stone throwing, non-conceptive sexual behaviour and embracing), resulting in missing 'data-points'.

This species shows a high number of potential traditions but further research is needed to reveal occurrence of multiple potential traditions across the studied

populations and whether this represents complex cultural variation. Delineating traditions in wild and free-ranging monkeys may help us to better understand the phylogenetic origins of human culture.

#### 5. 主な発表論文等

(研究代表者、研究分担者及び連携研究者には下線)

[雑誌論文] (計 2 件)

(1)

Watson, CFI and Matsuzawa, T (2017). Literature Survey of Potential Cultural Variants in Japanese Macaques (*Macaca fuscata*). *Folia Primatologica*. (published abstract).

(2)

Watson, CFI & Matsuzawa, T (2016). Limited spread of introduced arbitrary object-related conventions in captive monkeys. *International Journal of Primatology*, suppl. (published abstract).

[学会発表] (計 10 件)

(1) Watson, CFI and Matsuzawa, T (2017). Literature Survey of Potential Cultural Variants in Japanese Macaques (*Macaca fuscata*). To be presented at the Joint 7th European Federation for Primatology Meeting and the 30th French Society of Primatology Congress, Strasbourg, France, 22nd August.

(2)

Culture in Japanese Monkeys. Watson, CFI (2017). Invited talk to be presented in Sept at the 'Monkey Salon', Japan Monkey Centre (JMC), Inuyama, Japan, 24th September.

(3)

Studying culture, social influence and responses to death in monkeys. Watson, CFI (2017). Invited talk presented at the Psychology Division Seminar, University of Stirling, UK, 10th May.

(4)

Scotland to Japan: Studying culture, social influence and responses to death in monkeys. Watson, CFI (2017). Invited talk presented at the Psychology Division Seminar, University of Stirling, UK, 10th May.

(5)

How do Japanese macaque mothers behave towards their dead infants? Watson, CFI (2017). Invited talk presented at the First Kyoto Workshop on Evolutionary Thanatology: An integrative approach to the study of death and dying, Interdisciplinary Workshop, Kyoto University, Kyoto, Japan, 24th March.

(6)

Watson, CFI and Matsuzawa, T (2017). Cultural variation in Japanese macaques. Seventh International Symposium on Primatology and Wildlife Science, Kyoto, Japan, 2nd-5th March.

(7)

Watson, CFI and Matsuzawa, T (2017). An overview of cultural variation in Japanese macaques. The 61st Primates Conference, Japan Monkey Centre, Inuyama, Japan, 28th January.

(8)

Culture in Japanese Snow Monkeys. Watson, CFI (2016). Invited talk presented in July at 'Changeworks', 36 Newhaven Road, Edinburgh, UK, 11th July.

(9)

Exhibition of photographs: Cultural diversity in Japanese macaques. Watson, CFI (2016). Presentation given at 50th Anniversary Congress of the International Society for Applied Ethology Opening Ceremony, Assembly Rooms, Edinburgh, UK, 12th July.

(10)

Culture in Japanese 'snow' monkeys. Watson, CFI (2016). Invited talk presented in July, Season 4 programme, Explore Lifelong Learning, Commercial Union House, Newcastle, UK, 18th July.

## 6. 研究組織

### (1)研究代表者

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