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Toshisada Nishida's contributions to primatology

Published online: 31 August 2005
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Introduction

An international symposium, “African Great Apes: Evolution, Diversity, and Conservation” was held in Kyoto, Japan in March 2004. During three days of poster sessions and talks, over 100 scientists discussed the latest findings in the study of bonobos, chimpanzees, and gorillas. While participants were there to exchange the results of research reported in this special volume of *Primates*, an equally important reason for gathering was to honor Professor Toshisada Nishida upon his retirement as the Head of Kyoto University's Laboratory of Human Evolution Studies. On the day following the symposium, Professor Nishida presented an extremely lively and enlightening “final” lecture during which he regaled a packed auditorium with an account of his life and research career.

Nishida is one of the true pioneers in the study of primate behavior. His seminal research on the chimpanzees of the Mahale Mountains will forever stand as a landmark in the field. Nishida has helped to train an entire generation of primate field researchers in Japan. His contributions, however, extend well beyond his role as a mentor. His work has had an enormous impact on modern primatology. From this body of work, we single out three areas where Nishida's efforts will have an enduring influence, chimpanzee behavior, culture, and conservation.

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Chimpanzee behavior

The modern study of primate behavior was still very young when Nishida first set out to conduct fieldwork on the chimpanzees of the Mahale Mountains in 1965. Working near the village of Kasoje along the eastern shore of lake Tanganyika, he successfully habituated the small K “unit-group” of chimpanzees to human presence by provisioning them with sugar cane. He spent 22 months carefully observing K group chimpanzees around the provisioning station and published his first paper on chimpanzee behavior shortly thereafter (Nishida 1968). This paper is significant in three respects. First, he set a new standard for the analysis of primate social structure by developing a quantitative index to evaluate association patterns. This twice-weight index has been subsequently adopted by behavioral ecologists studying a wide variety of animals (Whitehead and Dufault 1999). Second, Nishida went a very long way to help clarify the social structure of wild chimpanzees in this initial publication. At a time when Goodall (1968) and others (e.g., Reynolds and Reynolds 1965) still considered chimpanzees to roam nomadically over large areas in the absence of any community boundaries, Nishida (1968) clearly established that chimpanzees lived in social groups. Group members formed temporary parties that varied in size and composition, with males much more gregarious than females. Third, in a remarkably prescient postscript Nishida (1968, p 219) reported female chimpanzees transferring between groups. He validated these observations in subsequent research performed with Kenji Kawanaka, the second Japanese scientist to join him to study chimpanzees at Mahale (Nishida and Kawanaka 1972).

While Nishida transformed our understanding of the social organization of chimpanzees through his initial observations at Mahale, he has gone on to conduct another 41 years of fieldwork that continues to this day. He has made new and significant discoveries about the

behavior of our closest living relatives repeatedly throughout this time. Following initial reports of tool use and hunting by Goodall and colleagues at Gombe (e.g., Goodall 1963; Teleki 1973), Nishida showed that both of these were characteristic features of the behavioral repertoire of chimpanzees (Nishida 1973; Nishida et al. 1979). He documented complex coalitionary tactics adopted by male chimpanzees in the wild (Nishida 1983) and developed intriguing new hypotheses about the functional significance of male cooperative behaviors such as meat sharing (Nishida et al. 1992). With the help of Kenji Kawanaka and his first two students to work at Mahale, Mariko Hiraiwa-Hasegawa and Toshikazu Hasegawa, Nishida successfully habituated a second unit-group of chimpanzees at Mahale, M group (Hiraiwa-Hasegawa et al. 1984). During subsequent observations, Nishida and colleagues witnessed males from the original K group disappear one by one after which it disintegrated with K group females transferring to M group (Nishida et al. 1985). These events furnished a unique opportunity to examine female chimpanzee social relationships in detail for the very first time (Nishida 1989). Finally in a paper published with one of us, Nishida reported the medicinal use of plants by wild chimpanzees (Wrangham and Nishida 1983). These observations helped to create an entirely new field of investigation, zoopharmacognosy, which continues to thrive today (Huffman 2001).

Chimpanzee culture

No single scientist founded cultural primatology, but Toshisada Nishida was one of the pioneers. His contributions to the field are several: ethnographer, comparative analyst, ethnologist, synthesizer, and even ethno-botanist.

As an ethnographer, his clear, comprehensive, and careful descriptions of chimpanzee behavioral patterns and their contexts span more than 30 years. Nishida's (1973) article on a form of elementary technology, ant dipping at Mahale, set new standards: qualitative natural history notes gave way to systematic, variable-driven, and quantitative description. This was followed by a string of reports of novel behavioral patterns from bark-eating (Nishida 1976) and leaf-clipping (Nishida 1980b) in early studies, to leaf-pile pulling (Nishida and Wallauer 2003), and grooming noises (Nishida et al. 2004), in recent times. The most comprehensive published behavioral repertoire or ethogram for *Pan troglodytes*, detailing more than 500 variants, is by Nishida et al. (1999).

In cross-cultural comparison, Nishida was among the first to appreciate the need for both across-population analysis (inter-populational) and across-group analysis (intra-populational). On the former front, he teamed up with others to elucidate variation in diet (Nishida et al.

1983) and medicinal plant use (Wrangham and Nishida 1983). In the latter domain, he used data from K- and M-groups to reveal diversity in responses to water (Nishida 1980a, from hydrophobia to hydrophilia) and termite fishing (Nishida and Uehara 1980).

If ethnology amounts to theory-driven, multivariate, controlled and explanatory comparison across multiple data-sets, then Nishida has been at the center from the outset. In the most-cited example of ethnological analyses on any non-human species (Whiten et al. 1999; see also Whiten et al. 2001), only Nishida's study-site of Mahale has two data-points, one each for K- and M-groups. This reflects his far-sightedness in seeking long-term data from more than one group in a population; others do this now, but he and his team did so first.

As cultural primatology grew, it was inevitable that someone would have to take the plunge in drawing together findings from a variety of nonhuman primate species. Nishida (1987) led the way in a much-cited and widely read chapter in *Primate Societies*. He has not shied away from seeking generalizations about primates since then, e.g., his chapter on primate gastronomy (Nishida 1991), nor in seeking wide-ranging factors to explain the diversity observed, e.g., his chapter emphasizing the role of individual inventiveness in the origins of innovation (Nishida 2003).

Finally, for those who use the phrase cultural primatology (more accurately, ethno-primatology) in its other sense of human-nonhuman primate interactive relationships at the local level, Nishida has also contributed. Nishida and Uehara's (1981) glossary of plant names of relevance to ape and human in the language of the Watongwe exemplifies the long-standing cooperation between his team and local people in the Mahale Mountains area of western Tanzania.

Thus, Toshisada Nishida has led the way in studies of chimpanzee culture at all levels, from the most focused to the most inclusive. His intellectual curiosity is manifest in being the first Japanese primatologist to publish original findings in a non-Japanese international journal (Nishida 1973) and also the first to co-author such results with a western colleague (Wrangham and Nishida 1983).

Chimpanzee conservation

Nishida's commitment to fieldwork at Mahale led to his first major conservation initiative in 1975, when he and Professor Junichiro Itani, proposed to the Tanzanian Government that the Mahale Mountains be maintained as a wildlife reserve. This led to a team of Mahale-based scientists collaborating to produce a detailed plan for the conservation of the Mahale Mountains. As a direct result of this effort, Mahale was gazetted as Tanzania's eleventh national park in 1985. In 1984 Nishida first proposed a Mahale Wildlife Conservation Society, and this became a reality in 1994. Nishida continued to work

diligently to promote primate conservation as President of the International Primatological Society (IPS) between 1996 and 2001. On completing his tenure as IPS President in 2001, Nishida became a special “Great Ape Envoy” for the Great Ape Survival Project (GRASP), and lobbied to create a project to conserve great apes globally. With the support of the IPS, he became Chairman of an IPS “Ad-hoc Committee for the World Heritage Status for the Great Apes”, organized meetings in Nairobi, Paris, and elsewhere to promote new mechanisms for great ape conservation through UNESCO and UNEP. He remains Co-Chair of the Great Ape World Heritage Species Project.

Nishida as colleague and friend

One of us (Wrangham) was the first Western scientist to visit Nishida’s Kasoje research site in 1971. A second (McGrew) had an opportunity to visit Mahale shortly after in 1975, and conducted fieldwork there again in 1982 and 1996. A third (Mitani) collaborated with Nishida at his Kasoje field site between 1989 and 1996. We feel blessed to have this long history with Toshi, as he is called by his Western colleagues, and we would be remiss if we did not comment on him as a person. Toshi has always been an exceedingly genial and gracious colleague. Each of us has stories of Toshi going out of his way, often at personal sacrifice, to accommodate our needs as visitors to Japan or while conducting fieldwork together at Mahale. He has become a trusted and loyal friend and ally to us all. His support and encouragement created opportunities for two of us (McGrew and Mitani) to carry out research on wild chimpanzees. Toshi’s unwavering support over the years has done much, not only to further our own research, but that of countless others in Japan. Toshi, his research, and tireless efforts at home and abroad have touched the lives of many.

Despite stepping down from his position at Kyoto University, Toshi remains an active participant in the primatological community. He has assumed new and important leadership roles at the Japan Society for the Promotion of Science and as the Director of the Japan Monkey Centre. In his capacity as Editor-in-Chief of *Primates*, he is doing much to preserve its importance as a forum for publishing new and exciting research in the field. As primatologists we are extremely fortunate and will continue to benefit through Toshi’s ongoing activities. But as should be abundantly clear from the preceding, Toshisada Nishida has already built a lasting legacy given the major contributions that he has made to advance our understanding of the behavior of wild chimpanzees and to ensure their conservation.

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