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Attitudes, knowledge and wild animals as pets in Costa Rica

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Abstract

A nationwide survey in Costa Rica, using Kellert's conceptual framework (Kellert, S. R. 1996. The Value of Life. Washington D.C., Island Press), revealed at least five attitude dimensions toward animals. Overall, Costa Rican adults have a strong sentimental attitude toward animals, an expression of feelings of affection toward animals. In contrast, the materialistic attitude, which regards animals as resources and praises acts of control over them, is weak. This reflects a prevailing opposition to the act of hunting per se, rather than to its potentially detrimental effect on natural populations. There is a strong inquisitive attitude, corresponding to a widespread interest in learning about the biology of animals and their habitats. High scores on the ethical attitude indicate concern for the ethical treatment of animals and nature. The schematic attitude emphasizes the role of aesthetic appearance in the preferences for certain animals and acknowledges feelings of aversion, dislike or fear of some animals. Scores for this attitude were weakly positive. The attitude profile of Costa Ricans is probably incomplete, given the small battery of questions used in this study and differences between this and Kellert's study in the assignment of questions to particular attitudes resulting from the factor analysis. Aesthetic appeal of the animals, compassion, affection and a desire to please and stimulate the children are important motives for the acquisition of wild animals as pets. These positive feelings and a misguided empathy for animals backfire by condemning these pets to an alien environment and inadequate care. The current study also showed that adults who keep wildlife have better biological knowledge than those who never kept wildlife as pets. In addition, Costa Ricans ranked highest in the percentage of correct answers to five questions about animals, in comparison to Kellert's data for US and Japanese citizens (Kellert S.R. 1993. Journal of Social Issues 49: 53–69). Such knowledge of natural history and an animal protection profile, however, do not translate into more animal friendly practices, as seen by the keeping of wildlife as pets under conditions of concern. Rather than chang-

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ing the attitudes of Costa Ricans toward animals, the challenge is to increase the awareness about the animals' needs and thereby trigger the ethical concern for their well-being.

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Keywords: *animal protection, animal welfare, attitudes, biophilia, captivity, conservation, culture, Neotropics, wildlife*

Introduction

The study of attitudes in a society provides insight into variables that may be pertinent to people's everyday decisions and practices involving animals. Pets have been commonly and affectionately kept in Middle America since pre-Columbian times (e.g., Mexico: Benítez-García and Durán-Fernández 2000). Positive feelings toward animals, however, do not necessarily lead to kind treatment, respect and consideration of the animal's needs. Keeping wild animals as pets is a matter of concern from the perspectives of compromised welfare of the individuals involved (Benítez-García and Durán-Fernández 2000; De Alió 2000; Drews 2000a; Jiménez-Soto 2000) and threat to wild populations from overexploitation (Rodríguez-Luna et al. 1996; Carvallo and Cantú 1998; Drews 2000b). In Latin America, there is a constant and, by and large, illegal demand for wildlife, especially for psittacids and other birds to be kept as pets (e.g., Bolivia: Martínez 2000; Colombia: Nassar-Montoya 2000; Chile: Muñoz-López and Ortiz-Latorre 2000; Ecuador: Touzet and Yépez 2000; Mexico: Benítez-García and Durán-Fernández 2000; Panama: Rodríguez 2000; Salvador: Ramos and Ricord de Mendoza 2000; and Venezuela: De Alió 2000). Such demand has been inferred mainly from the detection of large volumes of illegal trade, confiscations and donations of unwanted pets to rescue centers and zoos (contributions in Nassar-Montoya and Crane 2000).

In Costa Rica, wild animals are commonly and illegally traded to be kept captive as pets (Drews 2000b, 2001). In addition to the usual domestic animals kept in 66% of the households, wild, native species are found in 24% of households. Overall, 68% of Costa Rican adults report keeping a pet (domestic, wild or both). These values are high by international standards, exceeding the pet incidence in Germany, Netherlands, the US, Australia and Japan (Kellert 1993a; references in Drews 2001). Although parrots are the bulk of wild animals kept as pets, there is vast species diversity, including other birds, reptiles, mammals, amphibians, fishes and invertebrates. The decision to obtain a wild animal to keep at home is conceivably the product

of highly heterogeneous influences, including cultural upbringing and surrounding, attitudes, social condition, education, knowledge of natural history, tradition, gender, family composition, as well as logistical and legal considerations (Drews 1999). Drews (1999) suggested that strong sympathy and a misguided empathy for wild animals probably drives the interest in pet-keeping in Costa Ricans. In this study, I analyze how attitudes toward animals and biological knowledge are related to the likelihood that someone decides to keep a wild animal as a pet. The report describes attitudes toward animals in a Latin American country, using a framework which allows for comparison with similar studies from other regions.

Attitudes toward animals are shaped by our values, knowledge, perceptions and the nature of existing relationships between people and animals. Kellert (e.g., 1989, 1996) formalized a conceptual framework for the study of attitudes toward nature and associated values, which served as the basis for the design and analysis of this study. The concept includes various attitude types, which may act as a universal framework for comparisons between people and between cultures (Schulz 1985; Kellert 1989; Mordi 1991). The choice of Kellert's conceptual framework and methodology allows for an interpretation of differences and similarities between Costa Rica and other societies in those attitude types. An individual's actions are likely to be associated with his or her varying manifestations of each attitude type (Kellert 1989), and an individual's attitudes may change over time as a result of new experiences. Whilst attitudes toward animals are knowingly related to age, sex, urban/rural residence, education and socioeconomic status (e.g., Kellert 1996), this report focuses on the nationwide profile for cross-cultural comparisons. The causes of differences within Costa Rican society will be addressed elsewhere.

Although attitudes describe basic perceptions rather than behaviors (Kellert 1989), they probably shape in part the public's behavior toward animals and nature, in general. For instance, changes in attitudes have been critical to the success of species recovery projects (examples cited in Clark 2000). The study of human thinking about nature is central to understanding how people have legitimized their shaping of the environment and defined their role in it (see Hughes 1981 for a review of attitudes toward animals in ancient civilizations of the Mediterranean; Ponting 1993). Nygren (1992) studied the Costa Rican farmer's perception of the forest and nature in this context. There are, however, few base line, nationwide studies of attitudes toward animals and nature (e.g., US, Japan, Germany and Botswana: see Kellert 1993a; Kellert 1996; Schulz 1985 and Mordi 1991, respectively). These studies, using a similar methodology, revealed

considerable differences between nations in the way that people perceive and interact with animals. Kellert (1993a) discussed such differences in the light of historical, cultural and social characteristics.

Knowledge about natural history is another variable that affects human behavior toward animals. Knowledge tends to influence attitudes: those who know more about an object tend to have more of a rational and positive attitude toward that object, if it is appealing, than those who know less about it (Mordi 1991). The level of biological literacy can be compared across cultures by using a similar set of questions under comparable survey conditions. Such an approach is used in this study for a comparison with previously published data for American and Japanese respondents (Kellert 1993a). Previous research suggests that most Costa Ricans have a fairly superficial understanding and awareness of environmental problems (Holl, Daily and Ehrlich 1995). However, no studies thus far have explored Costa Ricans' knowledge of, and attitudes toward, animals.

An understanding of the link between attitudes, knowledge and practices is a key element to the design of efficient environmental policies. Costa Rica has been praised as a country of high conservation awareness and commitment toward the protection of its biodiversity (e.g., Vaughan 1994; Holl, Daily and Ehrlich 1995). It is poorly understood, however, to which degree such a committed environmental policy is equally reflected in the daily decisions of Costa Rican citizens. In Colombia and Ecuador, for example, an explicit environmental agenda in government and industry is not mirrored in the attitudes of the people toward nature, which are mostly consumptive and lacking awareness about the threats to wildlife and the importance of its protection (Nassar-Montoya 2000; Touzet and Yépez 2000). Nonetheless, the attitude of the population is considered by Costa Ricans as third in importance among the causes of environmental problems, after industry and lack of environmental education (Holl, Daily and Ehrlich 1995). A national, formal characterization of attitudes toward wildlife, biological knowledge and pet-keeping practices may provide some additional insights into the current commitment of the average Costa Rican toward the well-being of animals, and highlight avenues for improvements in practices, public awareness and environmental education programs.

Methods

Participants and procedure

The nationwide sample in this study consisted of 1021 Costa Rican households. The primary sampling unit was the census segment, i.e., a prede-

defined set of about 40 to 60 households used as the basic unit for the logistical planning of a national census. A total of 278 (2.6%) such segments were randomly selected with a probability proportional to their size, from the national total of 10,535 segments (1984 population census). The secondary sampling units were the households within each segment. The interviewer visited these systematically and clockwise from a random starting point until the sex and age quota for that segment was covered. Only one adult was interviewed in each household. The maximum sampling error associated with the 1021 households was 3.1% for a 95% confidence interval. In addition, 177 children aged between 9 and 17 years were also interviewed in these households, but were only included in the analyses where explicitly stated.

The sample consisted of 48% urban and 52% rural households, belonging to the socioeconomic strata as follows: 58% low/middle-low, 35% middle, and 7% middle-high/high. The sample did not differ significantly in the urban/rural proportions from demographic information about Costa Rica provided in the 1999 population projection of the *Central American Population Program* (<http://ccp.ucr.ac.cr>), and age quotas were based on the same source. There were no data available to determine if the proportions of the socioeconomic strata of the sample were representative of Costa Rican society.

Questionnaire

The questionnaire, administered through personal interviews, included questions about knowledge, attitudes and practices related to wildlife (available from the author upon request). Wildlife was defined to the respondents as any animal that usually lives in the forest, rivers, lakes or the sea, including mammals, birds, reptiles, amphibians, fishes and invertebrates. This investigation was introduced to the respondents as “...*a study about the relationship between Costa Ricans and nature.*” In 5.7% of the cases the interview was refused up-front and eight interviews (0.7%) were interrupted and therefore excluded from the sample. In 9% of cases nobody opened the door (a maximum of three revisits were made in such cases). Substitute, additional households were visited to complete the target sample. The data were collected between 16th March and 6th May, 1999. The completed questionnaires and the digital database were subject to scrutiny for inconsistencies, outliers and completeness. Data from one third of the interviews were double-checked by telephone call to the original respondent.

Analysis

The initial battery of attitude questions consisted of 39 items, with four possible answers on a Likert scale. Questions were selected from a questionnaire of 69 items administered by S. R. Kellert to study attitudes in the US (e.g., Kellert and Berry 1980), and adapted semantically to Costa Rican fauna and culture, where necessary. Pearson's correlation coefficients between the items did not exceed 0.5. Only 0.6% of answers were coded as missing (i.e., the respondent did not know the answer or refused to answer the question). For further processing, these cases were given the mean value of all answers for that item. Initial analyses of the question clusters assigned by Kellert to each attitude yielded alpha reliability coefficients lower than 0.57. Hence, questions were assigned to clusters representing attitudes anew, following a principal component, factorial analysis (PCA), with an orthogonal rotation. In this analysis, answers were given scores from 1 to 4 along a Likert scale of approval, allowing for a positive and a negative stance on each attitude. Attitude labels were given to each factor, upon interpretation of the cluster of questions associated with each one (the output of the PCA is available from the author upon request). Subsequently, individual scores on each attitude were calculated as the mean of the answers related to each attitude. These attitude scores were used for non-parametric, statistical comparisons between subgroups of the sample. Attitude profiles are shown for adults only. The statistics software package SPSS Version 8.0 (SPSS Inc., Chicago, USA) was used for the analyses. A confidence interval of 95% was used in all tests ($\alpha=0.05$).

Results

Attitudes

Among the resulting factors of the PCA, twelve questions were dropped for questionable relevance or lack of differentiating power. Five factors (inquisitive, sentimental, schematic, materialistic and ethical), consisting of 27 questions, remained after cleaning the initial outputs of the PCA (Appendix 1). These five factors, corresponding to attitudes toward animals identified among Costa Ricans, explain 39% of the variance in the items. Their alpha reliability coefficients ranged between 0.43 and 0.73. The *inquisitive* attitude reflects interest in learning about the biology of animals and their habitats. This attitude explained two thirds of the total variance attributed to the five attitudes. The *sentimental* attitude is about tender feelings toward animals, especially love. The *schematic* attitude dichotomizes the judgment of animals into simple categories such as nice

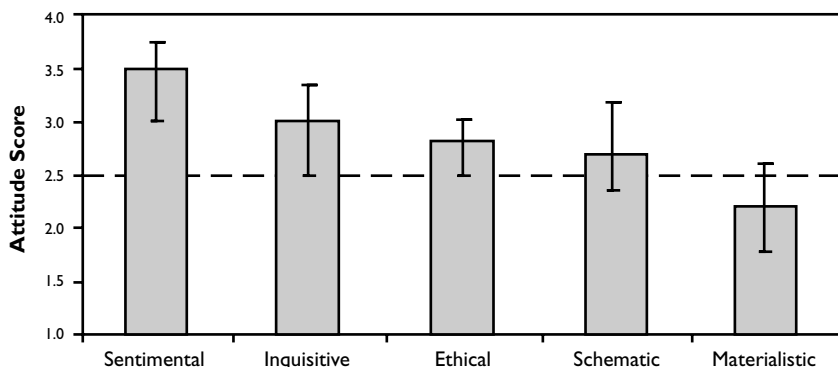


Figure 1. Levels of various attitudes toward wildlife among 1021 Costa Rican adults, showing medians and inter-quartile ranges. Values above 2.5 show a positive inclination toward the attitude, whereas values below 2.5 reflect disapproval.

and ugly, good and bad. It emphasizes the role of aesthetic appearance in the preferences for certain animals and acknowledges feelings of aversion, dislike or fear of some animals. The *materialistic* attitude relates to the extractive use of, and control over, animals. Animals are regarded as resources, or as living things that can be subject to our domination. The *ethical* attitude focuses on great care about what is right and wrong. It is concerned with the ethical treatment of animals and nature. This is not an exhaustive listing of Costa Rican attitudes toward wildlife. Other attitudes may be equally present in Costa Rican society but were not identified by the battery of questions used in this survey.

Overall, Costa Rican adults have a strong sentimental attitude toward animals (Figure 1). In contrast, the materialistic attitude is weak. There is a widespread interest in learning about the biology of animals (inquisitive attitude) and a majority show concern for the ethical treatment of nature (ethical attitude). In accord with this finding, 59.5% of the 1021 adult respondents disagreed with the keeping of wild animals in households. The schematic attitude lies just above the threshold of indifference, suggesting a slight bias toward positive values in this dimension in Costa Rican society.

The resulting factors were uncorrelated, as expected from an orthogonal rotation during the extraction of the principal components. However, there were correlations between attitudes, upon calculation of individual, single scores for each attitude. The inquisitive and the sentimental attitudes were significantly, positively correlated ($r_s=0.44$, $n=996$, $p<0.01$) and there were weak, negative, significant correlations between the schematic attitude and both the inquisitive ($r_s=-0.2$, $n=954$, $p<0.01$) and the ethical attitudes ($r_s=-0.2$, $n=947$, $p<0.01$). The materialistic attitude was weakly, positively correlated with the schematic attitude ($r_s=0.21$, $n=943$, $p<0.01$).

In order to analyze attitudes in relation to pet-keeping, adults interviewed in households, where wild animals were currently or previously kept, were divided into those who had had the idea personally to keep a wild animal at home and those who had not. People who decided to keep a wild animal at home as a pet had higher scores on the sentimental attitude than those who did not (Mann-Whitney $U=12471$, $n_1=146$, $n_2=220$, $p<0.001$). There were no significant differences in other attitudes between these two groups.

Although some of Kellert's attitude dimensions were embedded in the Costa Rican dimensions (Appendix 1), the actual battery of questions used in the US study only loosely fitted Costa Rican society, as shown by these facts: (a) 12 of Kellert's items were dropped for questionable relevance or for lack of differentiating power; (b) the resulting component structure explained only 39% of the variance in the 27 items; (c) three components still had relatively poor reliability (Cronbach's alpha <0.54 , Appendix 1); (d) many of the items appeared in different components to those found by Kellert; and (e) item groupings did not always appear intuitively coherent, e.g., "Watching birds as a hobby strikes you as a waste of time" as the first of the ethical items (see Appendix 1).

Knowledge

In an analysis of general biological knowledge, respondents were asked to judge as true or false five statements about animals. The same statements had been presented to Americans and Japanese during previous studies (Kellert 1993a). The statements and the percentage of correct answers (in brackets) among Costa Rican adults are: (1) the sea horse is a kind of fish (true: 73%); (2) spiders have ten legs (false: 58.5%); (3) all adult birds have feathers (true: 93.5%); (4) snakes have a thin covering of slime in order to move more easily (false: 42.1%); and (5) most insects have backbones (false: 69.4%). The mean percentage of correct answers among the five statements differed significantly between Costa Rica, the US and Japan (Kruskal-Wallis ANOVA, $\chi^2=8.2$, $df=2$, $p<0.02$), with Costa Rica ranking highest (67.3%), the US second (58.6%) and Japan lowest (41%, calculated from Kellert 1993a).

Adults in households currently or previously keeping wildlife had significantly higher biological knowledge scores than adults who never kept wildlife as pets (Mann-Whitney $U=118526$, $n_1=447$, $n_2=574$, $p<0.05$). Within Costa Rica, there was no significant difference in biological knowledge between the 9 to 17-year-olds and the adults.

Reasons for keeping wild animals as pets

Respondents who kept wild animals at home at the time of the study ($n=240$) were asked to give two reasons, in order of importance, why they kept wild animals at home. The most common first replies were: *They are nice/we like them* (30%), *We got them as a gift* (14.2%), *To stimulate the children* (5.8%), *Our child wants us to keep it* (5.8%). Only 2.1% replied *For company*. The primary motivation to obtain a wild animal, as reported by 147 adults who had had the idea personally to get a wild animal as a pet, was: *I liked the animal* (69.4%), *I felt sorry for the animal* (11.6%), *Because of family tradition* (7.5%), and *I considered it good for the children* (7.5%). Sixty-four percent of 1010 interviewed adults agreed with the statement that keeping wild animals at home nurtures in children an attitude of respect and love for nature. Only 33.9% of the respondents believed that keeping wild animals at home made the people better known in the neighborhood. There was no significant difference in this item between people who had kept wildlife and those who had not. This suggests that increasing prestige is probably not a key consideration when acquiring a wild animal.

Discussion

Attitudes in Costa Rica

Strong feelings of affection toward animals, a pronounced interest in learning about their biology and a widespread concern about the ethical treatment of animals emerged as traits of Costa Rican society. A generalized, positive stance along the ethical attitude and a negative stance on the materialistic attitude suggests that the Costa Rican public by-and-large is opposed to hunting and sustainable wildlife harvesting as a matter of principle. This portrait is protective of animals. This profile of attitudes toward animals is incomplete, however. Other attitude dimensions probably remained undetected by the relatively small battery of questions used in this study. In addition, there were marked differences in the allocation of items to particular attitude dimensions between this study and Kellert's instrument (Appendix 1). This is not surprising, given the cultural differences between the US and Costa Rica; this led to differing perceptions of each question. Thus, some of Kellert's attitude dimensions did not emerge distinctly from the battery of questions used (e.g., naturalistic, ecologicistic and scientific attitudes), while some became weak and others merged in the Costa Rican sample. Such incongruence highlights the importance of undertaking a culture-specific calibration of a larger battery of questions in future studies of Latin American attitudes toward nature.

According to Kellert (1989), the humanistic attitude emphasizes feelings of strong affection and attachment to individual animals, usually pets. Considerable empathy with animal emotion and thought typically accompanies the humanistic perspective; as a consequence, anthropomorphic, romanticized notions of animal innocence and virtue can result. A strong sentimental attitude, similar to Kellert's humanistic attitude, was identified in this study as a characteristic of people who decide to keep a wild animal as a pet. An idealized, anthropomorphic view of animals explains the apparent contradiction between the inadequate care conditions of the pets in people's households, and the feelings underlying the sentimental attitude. The results support the suggestion that a strong sympathy for animals is a critical determinant of the wish to keep wild animals as pets in Costa Rica (Drews 1999). A misguided empathy with the animal's needs is reflected in the poor captivity conditions offered to these pets, along with the belief that the pets are content, happy and not lonely (Drews 2000a).

The inquisitive attitude is closely related to Kellert's scientific attitude, in which the primary interests are the biological and physical characteristics of animals. The inquisitive attitude is also related to Kellert's naturalistic and ecologicistic attitudes, which involve an element of interest in understanding natural history and biological processes, respectively. The inquisitive attitude does not, however, necessarily imply an active interest in pursuing outdoor activities and seeking closeness to wildlife. In Costa Rica, the interest in learning biological aspects of animals is typically associated with a special affection for animals.

The essence of the moralistic attitude is a philosophical preoccupation with the nature of ethically appropriate human interaction with the non-human world (Kellert 1989). The ethical attitude of Costa Ricans is reminiscent of Kellert's moralistic dimension. Costa Ricans with a high ethical attitude tend to value animals irrespectively of aesthetic criteria and oppose the use and control of wildlife, a relationship also found among US citizens (Kellert and Berry 1980, p.132). Associated actions, however, depend on the realization that a given practice is ethically questionable. Thus, the ethical attitude revealed by the survey need not be mirrored in public stances on wildlife issues, unless people have the awareness and pertinent knowledge to judge them.

Kellert's aesthetic attitude primarily emphasizes the attractiveness of animals or the symbolic significance of their aesthetic merit and beauty (Kellert 1989). In this study, the schematic attitude does not include symbolic elements but rather an emphasis on a pragmatic, simple criterion for the preferences for, and dislike of, certain animals. The animal kingdom is

divided into the nice and the ugly, with little consideration of ecological or moral values. This schematic dimension of the preferences for certain animals is important among Costa Ricans with little interest in learning biology and among those who approve of the use and control of animals (materialistic attitude). A similar, positive association of a negativistic attitude with utilitarian and dominionistic attitudes was also found among US and German citizens (Kellert and Berry 1980, p. 132; Schulz 1985).

The important components of the materialistic attitude in this study are perceptions toward hunting, and an exploitative use of wildlife, associated with mastery and control of the prey. The practical and material value of the animal is a key element in Kellert's utilitarian dimension, whereas admiration for the skill, courage and prowess of hunting and taming animals embody the dominionistic dimension (Kellert 1989). Low values on the materialistic attitude in Costa Rica were derived from opposition to the act of hunting per se, rather than to its potentially detrimental effect on natural population levels. Utilitarian and dominionistic traits seem to be a natural grouping. These attitudes are positively correlated with each other both in the US and Germany (Kellert and Berry 1980, p. 132; Schulz 1985), and elements of both attitudes appear in the Costa Rican materialistic attitude (Appendix 1).

Costa Rican attitudes and other societies

Current attitudes toward animals in Latin America are shaped by a multicultural heritage. Attitudes toward wildlife in the Caribbean coast of Costa Rica, for example, can be related to the history of colonization by various ethnic groups, e.g., African, Caribbean, Hispanic and their resulting blends in modern culture (Vargas-Mena 2000). Therefore, marine turtles, for example, may have different cultural meanings: deity, merchandise, food, medicine, aphrodisiac, subject of scientific research, protected animal, managed animal, tourist attraction, and art (Vargas-Mena 2000). These meanings are not necessarily mutually exclusive in any given individual. This classification, with addition of the animal as subject of superstition and as pet, inspired an analysis of attitudes toward wildlife in Colombia, which illustrates the influence of indigenous and colonizing cultural traits (Nassar-Montoya 2000). A description of current views on wildlife in El Salvador mentions these attitudes: utilitarian or consumptive, cruel or contemptuous, dominionistic, compassionate, and naturalistic or scientific (Ramos and Ricord de Mendoza 2000). Elements of Kellert's typology can be associated with most of the above-mentioned cultural meanings and views on animals.

In general, a utilitarian attitude devoid of awareness about the threats to wildlife and the importance of its protection seems common among Latin Americans (contributions in Nassar-Montoya and Crane 2000). Not just commercial exploitation, but even subsistence hunting for food can lead to population declines of various Neotropical wild animals (Bedoya-Gaitán 2000). Ignorance about the finiteness of wildlife as a resource can be high among societies that commonly utilize animals (e.g., Botswana: Mordí 1991). The studies in Colombia, El Salvador and the Caribbean coast of Costa Rica suggest that the utilitarian, materialistic view of wild animals as food and source of income is possibly the most prevalent in the region. However, in Costa Rican society by-and-large the prevailing attitudes toward animals are the sentimental and inquisitive, whereas utilitarian views on wildlife are not popular. Similarly, the humanistic attitude was the most frequent perspective of animals in a sample of US adult citizens (Kellert 1989). Direct comparisons of attitudes between Latin American societies are hampered by the different methodologies used to characterize them. Nevertheless, the results of this Costa Rican study suggest that the region may be more heterogeneous in its attitudes toward animals than previously thought.

Kellert (1993a) compared the attitudes toward wildlife in the US, Germany and Japan using a standardized methodology. Direct comparisons of attitude score levels between these countries and Costa Rica are not possible due to differences in the composition of question clusters for each attitude and in the scoring method. The relative importance of certain attitudes, however, is amenable to comparisons with Costa Rica. Feelings of affection toward animals scored high among other attitudes in these four countries. Germany stands out, however, by showing a moralistic score much higher than any other attitude score. The relatively high importance of moralistic traits was similar in the US and in Costa Rica. In Japan this attitude had one of the lowest attitude scores. The utilitarian and dominionistic attitude scores were particularly low in relation to other attitudes in Germany and Costa Rica (materialistic attitude), and relatively high in Japan. The schematic attitude, which includes aesthetic and negativistic elements, was of intermediate importance in Costa Rica. The negativistic attitude was relatively strong in Japan and in the US, whereas in Germany it scored relatively low.

Costa Ricans relate to wildlife through strong affection, aesthetic appreciation, ethical concern and much interest in learning about it. Overall, the general public condemns expressions of mastery over wildlife and the hunting of animals for sustainable use. Such a relatively consistent

pattern is probably the product of the cultural homogeneity of Costa Rican society, the majority of which is of Hispanic heritage. This picture contrasts greatly with another tropical country, Botswana, where the prevailing attitude of the public was utilitarian (Mordi 1991). The next most pronounced attitude in Botswana was the theistic, an attitude introduced by Mordi in his study design, in which the population dynamics of wildlife was believed to be controlled by the supernatural. Other attitudes with high scores in Botswana were the scientific, the neutralistic and the negativistic. Humanistic feelings toward animals were rare in Botswana, probably because wild animals cannot be friends of the public and meat at the same time (Mordi 1991).

Attitudes, knowledge and wild animals as pets

Pet keeping is a common practice in Costa Rican society and its incidence is high by international standards (Drews 2001). In addition to the usual domestic animals, a large proportion of pet animals belong to wild, native species, which are typically caught in their natural habitat to satisfy the pet market. Every fourth household keeps wildlife as pets, and the number is increasing (Drews, unpublished data). This incidence of wild animals in households is similar in Nicaragua (22%, Zegarra and Drews, in prep.) and higher than the incidence in a suburb in Panama (14%, Medina and Montero 2001). There are reasons for concern about the welfare of wild animals in Costa Rican homes. Enclosures are small, animals are generally kept in isolation from conspecifics, diets can be inadequate, veterinary care is rare and mortality is high (Drews 2000a, b). In addition, the high extraction levels of wild pets, mainly parrots and other birds from their natural habitat to satisfy this illegal pet market, may have a strong negative impact on wild populations.

The sentimental attitude was stronger in the person who decided to keep a wild animal at home, than in adults who did not initiate the acquisition of a pet. Thus, keepers provide wild pets inadequate care despite their strong affection for animals. The result supports the hypothesis that a marked sympathy and misplaced empathy with the pets perpetuates this practice in Costa Rica (Drews 1999). Biophilia, the innately emotional affiliation of human beings to other living organisms (Wilson 1984), can be conceptually linked to values and attitudes toward animals (Kellert 1993b). Biophilia probably contributes to the positive feelings of Costa Ricans toward wild animals but has a negative side: the habit of keeping them condemned to an alien environment and permanent captivity. The contradiction between attitudes and practices is further illustrated by the

fact that despite a stronger affinity to animal protection among households of high socioeconomic status, the percentage of households with wildlife did not differ between the socioeconomic strata (Drews 2000a).

Various reasons have been put forward to explain why people keep wild animals as pets in the Neotropics: cultural heritage, family tradition, emblem of social status, fashionable practice (Benítez-García and Durán-Fernández 2000), eccentricity, as collection items, company, and as gifts (Touzet and Yépez 2000). In Costa Rica, the main reasons to obtain a pet are the aesthetic appeal of the wild animal and a sentimental, compassionate attitude toward it. In addition, wild pets are maintained to please the children and stimulate their bond with nature. Although such pets might foster a fascination for wildlife, they portray an anthropomorphic setting that detaches the animal from its natural requirements and ecological role. The pet legitimizes, in the eyes of the children, a capricious taking and using of elements of nature that disregards the implications for the individuals, species and ecosystems. Surprisingly, interest in pet-keeping is also high in Botswana, a country with a prevailing utilitarian view on wildlife (Mordi 1991).

Fascination for animals is associated with greater knowledge about their biology. The level of biological literacy among Costa Ricans is high by international standards, when compared to US and Japanese citizens. Such knowledge, however, does not translate into more animal friendly practices, as seen by the keeping of wildlife as pets under conditions of concern. In fact, adults who keep or have kept wild animals at home scored significantly higher on the biological knowledge scale than those who have not. Similarly, animal-activity groups in the US scored higher on the knowledge-of-animals scale than did the general public (Kellert 1989). The Costa Rican data suggest that neither positive attitudes nor good basic biological knowledge lead necessarily to good practice.

By and large, the negative impact on wildlife is not the consequence of malicious behavior or the intention to harm (Clark 2000), as illustrated by the desire to keep wild animals as pets. Kellert (1989) notes that an emotional rather than intellectual basis of positive attitudes and concern for animals poses some potential problems to wildlife conservation. The focus on pets and specific, charismatic, wildlife species can lead to an overemphasis of a narrow segment of animals among a concerned, general public, that overlooks more basic considerations of ecological relationships between all animals and their natural habitats. In addition, such an emotional sympathy and misguided empathy for animals results in practices that compromise their well-being.

Notwithstanding, it does not seem to be pertinent to change the current attitudes of Costa Ricans toward animals, but rather to increase their awareness about the animals' needs. Recognition of ethically problematic situations involving animals should trigger a moralistic response in most Costa Ricans. But people with little contact with animals in their habitats are likely to perceive them wrongly (Bryan and Jansson 1973). Adolescents (9–17 years) are a critical target group of education efforts, given their low animal protection profile. They are more likely to approve of the keeping of wild animals at home, and have lower sentimental and ethical attitudes toward animals than adults (Drews, unpublished data). Their interest in learning about the biology of animals, however, is stronger than in adults. This is an asset for receiving an input of natural history facts and values that link biology to ethical principles. The task is challenging; a modification of behavior by providing key elements of biology and ethics in a convincing setting. An interactive, biological education program in natural habitats should foster an ecologicistic appreciation of the wildlife, leading to citizens capable of rational and informed decisions pertaining to the natural environment (Valverde 2000). The protectionist profile of Costa Ricans, in general, is a platform that probably ensures receptivity to education campaigns specifically addressing the concerns about wild animals kept as pets. The existing bedrock of affection and concern, no matter how naively expressed, is a starting point for its transformation to a more ecological and appreciative commitment (Kellert 1989). Humanitarian feelings, compassion and moralistic considerations should be praised as a gift that must lead to respecting the freedom of wild animals, emancipating the person from the drive of possessiveness. Clark (2000) advocates the search for the motivational self-interest that elicited the practice in question, and then showing that there are more rewards in the alternative behavior. The desire to have an emotionally and aesthetically gratifying pet can be channeled toward adequate care of domestic, rather than wild species.

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Appendix I.

Questions representing the five attitudes of Costa Ricans toward animals identified in this study. Questions were listed in a mixed order in the questionnaire. Possible answers on the Likert scale were Definitely yes, Generally yes, Generally not, Definitely not. Cronbach's alpha reliability coefficient and eigenvalues for each cluster of questions are shown in brackets, next to the attitude label. The attitude corresponding to Kellert's questionnaire under his typology (see, for example, Kellert and Berry, 1980) is shown in brackets after each question.

Inquisitive attitude ($\alpha=0.73$, eigenvalue=3.76)

"Are you very interested in learning about mangroves and wetlands, where egrets and ducks are found?" (K-ecologicistic)

"Are you interested in learning about the functioning of an ant colony and the relationship between ants and plants of the forest?" (K-ecologicistic)

"Are you very interested to learn about the functioning of the organs of deer and eagles?" (K-scientistic)

"Do you like very much to learn about the life of snails and frogs?" (K-scientistic)

"Are you fascinated about the differences between animal groups?" (K-scientistic)

"When you stroll through the bush, do you like to look for rare insects?" (K-naturalistic)

Sentimental attitude ($\alpha=0.72$, eigenvalue=2.44)

"Your love for animals is among your strongest feelings?" (K-humanistic)

"Being able to love an animal is an important part of your life?" (K-humanistic)

"If you consider yourself a person who likes animals, would you even say you love them?" (K-humanistic)

"Should animals have rights that can be represented by a lawyer?" (K-moralistic)

Schematic attitude ($\alpha=0.53$, eigenvalue=1.75)

"If given the choice between seeing a beautiful animal like a wild horse or an unattractive animal like an opossum, would you much prefer to see the wild horse?" (K-aesthetic)

"When choosing a pet, is it important for you that it be beautiful?" (K-aesthetic)

“Do you think that rats and cockroaches should be eliminated?”

(K-negativistic)

“Generally, are you more interested in watching exciting animals such as eagles or horses than boring ones such as a clay-colored robin or mice?”

(K-aesthetic)

“Do creepies like spiders or mice generally have a poor value for nature?”

(K-ecologicalistic)

“Are you afraid of most spiders?” (K-negativistic)

Materialistic attitude ($\alpha=0.51$, eigenvalue=1.31)

“Do you admire the skill and courage of a person who hunts in the jungle successfully?” (K-dominionistic)

“Do you approve of harvesting deer for their meat, as long as these animals are not endangered?” (K-moralistic)

“Do you think that the main reason for protecting deer is to keep us from running out of wild meat?” (K-utilitarian)

“Do you admire a person very much who can train animals to do skillful animal acts?” (K-dominionistic)

“If there are enough crocodiles in Costa Rica, do you approve of the hunting of some for selling their skins?” (K-utilitarian)

Ethical attitude ($\alpha=0.43$, eigenvalue=1.21)

“Watching birds as a hobby strikes you as a waste of time?” (K-naturalistic)

“Do you regard any kind of hunting for entertainment or sport as cruel to animals?” (K-moralistic)

“Does the keeping of animals in cages, even in good zoos, seem cruel to you?” (K-moralistic)

“Do you believe that a person sometimes has to severely punish a horse or dog to get it to obey orders properly?” (K-dominionistic)*

“Do you think love is an emotion people should feel for other people, not for animals?” (K-humanistic)*

“Do you think it is right to log part of a natural forest, if the land is to be used for agriculture and provides people with work?” (K-utilitarian)*

* The scores of these questions were reversed along the 1–4 Likert scale.