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THE LOVABLE, THE LOATHSOME, AND THE LIMINAL: EMOTIONALITY IN ETHNOZOOLOGICAL COGNITION

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ABSTRACT.—In this paper we demonstrate the interrelationship between emotional meaning and ethnozoological cognition in American culture. Data were obtained from 101 undergraduates who freelisted the names of the animals they like as well as the names of those they dislike. Respondents also rated the five ethnozoological life forms (birds, snakes, fish, mammals, and ''wugs'') according to personal preference. We found a significant correlation between the evaluation of each life form (e.g., the relative order of preference) and the cognitive salience of the life form on the freelists. Concordance was also found between the evaluation of each life form and the respective proportion of each life form on the freelists. In addition, we discovered a strong level of intragroup agreement among the ratings of the five life forms. Our conclusions support the growing body of evidence suggesting that culturally programmed orientations toward living creatures constitute a powerful component in ethnobiological information processing.

Key words: ethnozoology, wildlife attitudes, social cognition, symbolism, emotion.

RESUMEN.—Este trabajo demuestra la relación entre los aspectos emocionales y el aprendizaje etnozoológico en la cultura de los Estados Unidos. Los datos se obtuvieron de 101 estudiantes de licenciatura que proporcionaron listados libres de nombres de animales que les gustaban y que les disgustaban. También ordenaron según sus preferencias personales cinco formas de vida (pájaros, serpientes, peces, mamíferos y ''wugs'' (neologismo formado por las palabras inglesas con las que se denomina normalmente a los gusanos 'worm' e insectos 'bug'). Se encontró una correlación significativa entre la valoración de cada forma de vida (por ejemplo, el orden relativo de preferencia) y la relevancia de las formas de vida en los listados libres. Se encontraron concordancias entre la valoración de cada forma de vida y su proporción en los listados libres. Además, se encontró una gran similitud intragrupal en la importancia que dieron a las cinco formas de vida. Nuestras conclusiones apoyan al conjunto de evidencias que sugieren que los prejuicios culturales hacia los seres vivos constituyen un factor muy relevante en el procesado de la información etnobiológica.

RÉSUMÉ.—Dans cet article, nous examinons la relation entre la cognition ethnozoologique et la signification affective dans la culture américaine. Les données proviennent de 101 étudiants de premier cycle ayant fourni des listes indépendantes de noms d'animaux qu'ils aiment ou n'aiment pas. Les répondants devaient également coter les cinq formes de vie ethnozoologiques

(oiseaux, mammifères, serpents, poissons, ''wugs'' (néologisme formé à partir de la fusion des deux termes suivants, 'worm' et 'bug') selon leur propre préférence. Nous avons trouvé une corrélation significative entre l'évaluation de chaque forme de vie (c'est-à-dire, l'ordre relatif de préférence) et l'importance cognitive des formes de vie apparaissant sur les listes. Aussi, l'évaluation de chaque forme de vie correspond aux proportions relatives de chacune de ces formes sur les listes. De plus, nous avons décelé un fort degré de correspondance infra-groupe parmi les cotes données aux cinq formes de vie. Notre conclusion vient appuyer l'idée, soutenue par de plus en plus d'évidences, qui veut que les affects culturels constituent une composante importante quant au traitement des données ethnobiologiques touchant les êtres vivants.

INTRODUCTION

There is no doubt that animals occupy a significant symbolic role in human cultures. Animals evoke a range of powerful emotions, spanning fear, dread, and disgust, to fascination, compassion, and delight. Consequently, animals figure prominently in theoretical discourse on human cognition, behavior, and social life. In his seminal essay ''Animal Categories and Verbal Abuse,'' Leach (1964) developed a theory of taboo based on animal categories and their correlations with sexual relationships and edibility. Lévi-Strauss (1969) envisioned human social organization as an extension of ''mental structures,'' which signify the meaning of animal behavior and morphology for members of totemic communities. More recent ethnographic compilations have revised and advanced the structuralist approach to human ecology through semantic analyses of animal domains (e.g., Willis 1990).

Ethnobiologists now carry the torch of human-animal scholarship by exploring how animals are imagined and understood cross-culturally. Vital connections have been forged between the social and natural sciences, particularly through the investigation of ethnozoological classification systems (e.g., Anderson 1996; Berlin 1992; Brown 1984; Gardner 1976; Hunn 1976; Mancabelli 2005; Morris 1998; Rea 1998). The pervasive interest in human-animal relationships can be seen in other academic disciplines, including folklore (Brady 1990; Gillespie and Mechling 1987; Hufford 1992), conservation ecology (Gray 1993; Kellert 1989, 1996), history (Creager and Jordan 2002), sociology (Franklin 1999), cognitive psychology (Henley 1969), environmental science (Hoage 1989), and political science (e.g., Preece 1999).

Symbolic representations of animals are structured by the feelings, attitudes, and values that individuals acquire through the experience of enculturation (Baker 2001). The relationships between animals and people are especially complex in American culture, where multiple forces continuously shape how animals are understood. Hoage (1989:xv) asserts, for example, that the perceptions of animals in American culture have been influenced by innumerable factors, including myths, folklore, the frontier experience, religion, changes in economics and social structure, inventions, politics, philosophy, wildlife research, zoos, the press, films and television, and the conservation and animal rights movements.

In their introduction to *American Wildlife in Symbol and Story*, folklorists Gillespie and Mechling (1987:4–8) identify seven sources of information in the United States that engender public beliefs about wild animals. These include conversational genres, oral narratives, children's literature, popular/commercial culture, public performances, elite culture, and scientific discourse. Indeed, these sources inform our understanding of how cultural messages contribute to our emotional orientations toward categories of animals. However, with a few significant exceptions (e.g., Anderson 1996), we have yet to fully explore the contribution of emotionality to ethnozoological cognition.

The impact of globalization on human-animals relations is evident on a number of social and commercial levels, including the recent trend toward ''wildlife tourism'' (e.g., Robinson and Novelli 2005). Recreational travel now involves opportunities for consumers to observe and experience wildlife in natural habitats. Sport hunting, as practiced in America, generates considerable controversy and discourse among those interested in public attitudes toward animals (Dizard 2002). As relationships between human and animal populations continue to change, wildlife conservation strategies are becoming increasingly relevant on ethnobiological research agendas. Therefore, it is critical to explore our knowledge *and* emotional orientation toward the faunal inhabitants of the natural world.

In this study we investigate the effects of positive and negative emotionality on ethnozoological knowledge among American college students. We believe that emotion plays a critical role in ethnobiological information processing (Nolan and Robbins 2001); human cognition of animal domains is graded according to positive and negative responses to various categories of animals. Strong preferences—and conversely, strong aversions—should facilitate complex indexing of ethnozoological items stored within cognitive systems (e.g., Zajonc 1980). And if there is indeed an emotional analog to information processing and retention, then the most ''liked'' animal domains and the most ''disliked'' animal domains should be among the most salient in an individual's semantic space. Likewise, the constituents of emotionally significant domains (e.g., mammals, which are generally revered, and snakes, which are commonly disdained) should be encoded with higher lexical specificity (e.g., border collie, timber rattlesnake, etc).

SCOPE OF THE PRESENT STUDY

Here we focus on Cecil Brown's five ethnozoological life forms of the animal domain—mammals, birds, fish, snakes, and ''wugs.'' The wug taxon includes ''creatures denoted by bug in American English…and is commonly extended to worms…[and] other small creatures such as snails, tortoises, crabs, and lizards'' (Brown 1979:792). Life form domains are ethnobiological categories based on natural, easily perceptible discontinuities in animal morphology, and have been documented cross-culturally in folk taxonomic studies. We also investigate the cognitive assimilation of the less inclusive ethnobiological ranks of animal terms in American English, which, within the life form rank, include the generic level of recognition (e.g., trout), the specific level (e.g., rainbow trout), and the varietal (e.g., Ozark rainbow trout).

TABLE 1.—Typical freelist of liked animals.

	Animal term	Life form	Rank
1	Dog	generic	mammal
2	Horse	generic	mammal
3	Lion	generic	mammal
4	Tiger	generic	mammal
5	Squirrel	generic	mammal
6	Rabbit	generic	mammal
7	Goose	generic	bird
8	Swan	generic	bird
9	Duck	generic	bird
10	Bald eagle	specific	bird
11	Sparrow	generic	bird
12	Robin	generic	bird
13	Trout	generic	fish
14	Salmon	generic	fish
15	White bass	specific	fish
16	Striped bass	specific	fish
17	King snake	specific	snake
18	Ladybug	generic	wug

Our research addresses three hypotheses regarding the interrelationships between affective meaning, cognitive retention, and linguistic encoding of ethnozoological information. The three hypotheses are: (1) when ''liked'' animals are elicited, respondents will list a higher proportion of life forms with high positive ratings; (2) when ''disliked'' animals are elicited, respondents will freelist a higher proportion of the most negatively rated life forms; and (3) the cognitive salience of life forms freelisted by respondents will be concordant with their affective value for both liked and disliked animals.

METHODS

Our first task was to determine the range of animals viewed positively and negatively from our respondents. To accomplish this, we asked our respondents to freelist animal names, an accurate method used frequently by social scientists to assess the content and boundaries of cultural domains (Quinlan 2005). Freelists were obtained from a group of 101 undergraduate and graduate students at the University of Arkansas, who were asked to list the names of all the animals they like, and to list the names of all the animals they do not like. Respondents were also asked to rank the five ethnozoological life forms (mammals, birds, fish, snakes, and wugs) in order of the most liked to the least liked. These life forms represent a continuum ranging from most liked, in the case of mammals, to the least liked, in the case of wugs (e.g., Kellert 1989). Each freelisted item was coded according to the corresponding life form and the corresponding ethnobiological rank (see Table 1 for a typical freelist of liked animals).

We used the software program ANTHROPAC 4.95 (Borgatti 1995) to compute the frequency of mention all items provided on the lists of liked and disliked animals. In addition, the cognitive salience of each life form domain was calculated using a technique designed for measuring salience in freelists

TABLE 2.—Mean ranks and freelist salience of life forms.

| Life Form | Mean Rank | Salience (B) | |
		Liked	Disliked
Mammals	1.25	0.688	0.188
Birds	2.53	0.345	0.287
Fish	2.66	0.311	0.292
Snakes	4.21	0.109	0.445
Wugs	4.35	0.036	0.569

(Robbins and Nolan 1997). The measure B ranges between an upper bound of 1, in which all members of a designated category of items appears first in a freelist, and a lower bound of 0, in which all other items are listed first. The B value was calculated for each life form on each list, and correlated with the proportion of items listed within each life form.

Table 2 displays the mean rankings of the five life forms, and the average salience (B) of each life form on the liked and disliked freelists. As expected, mammals received the highest ranking, followed by birds, fish, snakes, and wugs. Kendall's coefficient of concordance (W) was used to measure the level of intragroup agreement for the rankings of the five life forms. We found significant concordance among the rankings (W = 0.671), indicating a strong consensus among the life form evaluations. Not surprisingly, mammals were the most salient life form on the liked lists (B = 0.687), and the least salient on the disliked lists (B = 0.188). Conversely, wugs were the most salient life form on the disliked lists (B = 0.569), and the least salient on the freelists of disliked creatures (B = 0.036).

RESULTS

Freelist Analysis.—Respondents listed a total of 372 liked animals, and a total of 236 disliked animals. The mean list length of liked animals was 22.16, which is significantly higher than the mean list length of disliked animals at 13.86 ($t = 5.1$, $p < 0.001$). The difference in these means indicates that animals regarded favorably by respondents are cognitively privileged over those that are regarded negatively.

Table 3 lists the 48 most commonly named liked and disliked animals in descending order of frequency. The corresponding salience value B is also given for each animal term. At the top of the list of liked animals are domesticated mammals (dog, horse, cat), followed by two popular and amusing species (dolphin and monkey), and several wild mammals (deer, tiger, lion). One insect, the butterfly, was also listed among most liked creatures. Interestingly, most of these species have anthropomorphic qualities: physical features that seem to mirror those of humans. Creatures regarded positively by people also tend to be perceived as quasi-human in their intelligence, behavior, and familiarity. A historical account of animal sentiments in American culture is offered by Russow (1989:33), who asserts that "the most interesting aspect of American culture's emotional orientation toward animals is the tendency to neotenize them, to see

TABLE 3.—Cognitive salience of frequently listed liked and disliked animals.

	Liked animals				Disliked animals		
Rank	Item	% listing	B Value	Rank	Item	% listing	B Value
1	Dog	82	0.711	1	Mosquito	53	0.292
2	Horse	63	0.477	2	Snake	52	0.379
3	Cat	57	0.354	3	Roach	45	0.279
4	Dolphin	44	0.238	4	Spider	44	0.345
5	Monkey	43	0.224	5	Rat	42	0.209
6	Deer	42	0.201	6	Tick	41	0.255
7	Tiger	36	0.222	7	Wasp	32	0.191
8	Lion	35	0.188	8	Shark	31	0.148
9	Butterfly	35	0.153	9	Flea	31	0.167
10	Elephant	34	0.185	10	Fly	30	0.146
11	Eagle	32	0.182	11	Jellyfish	29	0.125
12	Squirrel	31	0.133	12	Scorpion	26	0.158
13	Whale	31	0.161	13	Rattlesnake	25	0.163
14	Cow	31	0.187	14	Possum	21	0.122
15	Giraffe	31	0.144	15	Alligator	20	0.071
16	Rabbit	27	0.114	16	Bee	20	0.111
17	Bear	27	0.158	17	Chigger	20	0.092
18	Turtle	26	0.121	18	Mouse	20	0.103
19	Ladybug	26	0.113	19	Copperhead	19	0.111
20	Duck	25	0.126	20	Black widow	15	0.095
21	Cardinal	22	0.135	21	Centipede	15	0.072
22	Trout	22	0.142	22	Brown recluse	14	0.096
23	Hummingbird	22	0.136	23	Crocodile	13	0.049
24	Zebra	22	0.097	24	Ant	13	0.078
25	Raccoon	19	0.075	25	Eel	13	0.051
26	Hawk	19	0.113	26	Leech	12	0.047
27	Gorilla	19	0.082	27	Worm	12	0.074
28	Seal	19	0.064	28	Crow	12	0.048
29	Penguin	18	0.085	29	Slug	12	0.064
30	Fish	18	0.121	30	Fire ant	12	0.069
31	Parrot	17	0.103	31	Gar	12	0.061
32	Bird	16	0.113	32	Cat	12	0.083
33	Catfish	16	0.102	33	Bear	11	0.072
34	Hippopotamus	14	0.063	34	Tarantula	11	0.058
35	Pig	14	0.088	35	Hyena	11	0.053
36	Sheep	14	0.077	36	Skunk	11	0.074
37	Snake	14	0.101	37	Hornet	11	0.061
38	Elk	14	0.078	38	Buzzard	10	0.042
39	Goat	14	0.075	39	Wolf	10	0.043
40	Ferret	14	0.079	40	Pigeon	10	0.069
41	Wolf	14	0.082	41	Water moccasin	10	0.065
42	Bass	14	0.087	42	Cottonmouth	10	0.063
43	Polar bear	13	0.043	43	Dog	10	0.056
44	Lizard	13	0.066	44	Armadillo	10	0.052
45	Kangaroo	13	0.059	45	Coyote	10	0.051
46	Coyote	13	0.047	46	Vulture	10	0.044
47	Turkey	12	0.055	47	Horsefly	10	0.044
48	Dragonfly	12	0.055	48	Lizard	9	0.039
49	Fox	12	0.061	49	Fox	8	0.033
50	Goose	12	0.043	50	Ferret	8	0.037

them as children.'' Because they are judged favorably, these ''lovable'' creatures become affines—targets of human empathy, affection, and emotional projection (Lockwood 1989). And as such they are romanticized and symbolized extensively in popular folklore, comics, cartoons, and elsewhere in American culture (Gillespie and Mechling 1987).

Of the disliked animals, the most frequently listed include mosquito, snake, roach, spider, rat, tick, wasp, shark, and flea. Most of these creatures are classified within the ''wug'' category, and are regarded culturally as pests. The negative emotions associated with pests are evident in the Western ethos that encourages systematic eradication and control of all ''problem'' animals that threaten health, home, and property (e.g., Knight 2000). Kellert (1989) asserts that the most feared creatures are those believed to be dangerous, destructive, or diseased.

The appearance of the term ''snake'' is also of interest here. ''Snake'' denotes all constituent members of the life form (e.g., garden snake, copperhead, cottonmouth) (Nolan and Robbins 2001). Thus its appearance as the second least-liked creature on the freelists reveals just how pejorative snakes are deemed to be. The negative judgment of ''rat'' and ''shark'' was not surprising, given their ostensible affiliation with death and danger. Jones (2000) reminds us that ''scavengers….[such as] rats, snails, and insects possess uncanny qualities that threaten through the prospect of contact or ingestion.'' Others argue that creatures such as slugs, snails, worms, and centipedes and other wugs are loathsome to Euroamericans because they symbolize decay, putrefaction, regeneration, and what Miller (1997:42) calls ''the fecundity of the slippery.'' Miller further elaborates that these revolting creatures ''do not disgust us as animals but because they have characteristics that are disgusting: sliminess, slitheriness, teemingness'' (1997:49).

Of special relevance to our discussion are the animals that appear on both cumulative lists. Most are mammals: dog, cat, fox, bear, coyote, wolf; but one member of the wug category, the lizard, also appears on both lists. With the exception of the ''tame'' members of this set (e.g., dog, cat), these animals are ambiguous with relation to the nature/culture dichotomy often used in structural analyses of symbolic systems. Bears, wolves, foxes, and coyotes, for example, represent creatures that cross the precarious boundaries between cultural ''places'' and natural ''spaces.'' While our respondents generally regard mammals favorably, there is considerable ambivalence surrounding liminal creatures that transcend the nature/culture divide. Foxes and coyotes, for example, are classified alternately as destructive ''vermin'' and elusive ''game,'' depending on the context in which they are socially engaged and imagined (e.g., Marvin 2002). However, the undesirability of mammals that ostensibly threaten human well-being and safety (e.g., bears, wolves) is apparently mitigated by the ecological concern for their continued survival (Knight 2000). As Gillespie and Mechling (1987:3) point out, these anomalous creatures hold special status in human-wildlife scholarship because they ''mediate between binary oppositions, providing a culturally acceptable way to deal with the anxieties and uncertainties created by the ambiguity of the middle.'' The ambivalence associated with these animals is evidenced by their pervasiveness on nearly every level of expressive
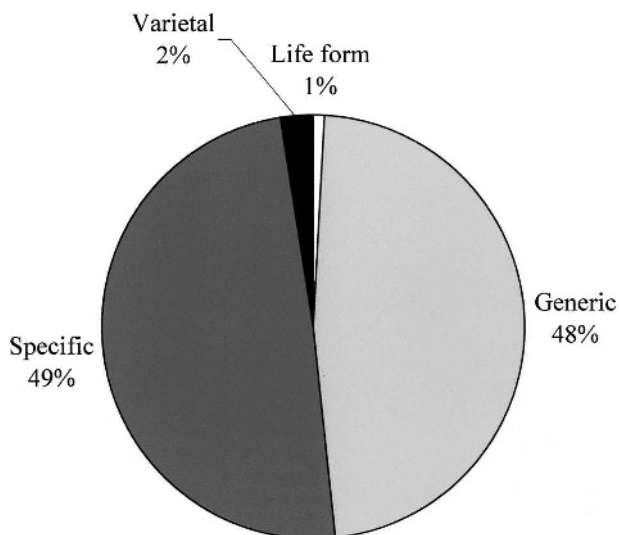
FIGURE 1.—Proportion of ethnozoological taxa coded on freelists of liked animals.

culture, including Native American myth and ritual performances, Euroamerican legendry, ''survival stories,'' urban legends, comic strips, and television commercials. Accordingly, knowledge of wild animals in the US is generally abstract and indirect, guided by mass-mediated images and popular cultural beliefs rather than personal experiences.

Further analysis of the freelists revealed that the total proportion of life forms, generics, specifics, and varietals coded on the liked lists was generally concordant with the proportions coded on the lists of disliked animals. Most ethnobiologists agree that the generic rank (e.g., trout, fox) is the most prominent level of recognition in folk taxonomic systems (Berlin 1992), and that the differentiation of generics into folk specifics (e.g., rainbow trout, red fox) is a function of cultural importance (e.g., Atran 1999; Hunn 1982). Here we found that generic-level animal terms were common on both freelist datasets, as seen in Figures 1 and 2, which graphically depict the proportion of listed items within each taxonomic rank. However, folk specifics were also ubiquitous in both of the aggregated lists, comprising 49% of the composite list of liked animals and 41% of the total list of disliked animals. It appears that animal terms with strong positive or negative emotional connotations are lexically encoded according to culturally relevant dimensions.

Hypothesis Testing.—The data support our first hypothesis: we found that respondents listed a higher proportion of positively rated life forms when liked animals were elicited. For respondents who regard birds favorably and rank them first in preference, for example, the number of items within the bird life form (e.g., robin, canary) was proportionally higher than the number of listed items within other life forms. Conversely, those who dislike wugs, for example, and ranked them last in preference listed a relatively small proportion of wugs on their list of liked animals. Figure 3 illustrates the correlation of life form
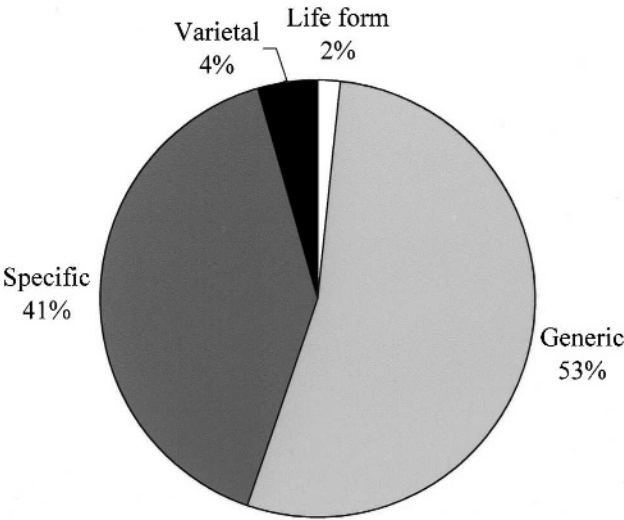
FIGURE 2.—Proportion of ethnozoological taxa coded on freelists of disliked animals.

ratings to the proportional representation of each life form on the freelists of liked animals. As expected, this correlation is statistically significant across all life form domains ($r = 0.774$, $p < 0.001$)

The data also support our second hypothesis: we confirmed that respondents freelisted a greater percentage of disliked life forms when disliked animals were elicited. To illustrate, those with a negative emotional orientation toward snakes listed a comparatively higher number of items within the snake life form. Similarly, those who regard mammals positively listed proportionally fewer kinds of mammals when disliked animals were elicited. The relation between life
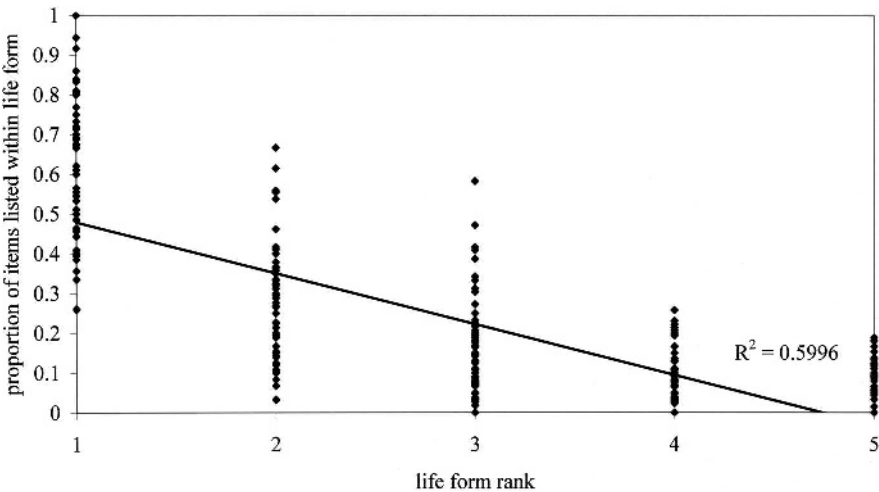

FIGURE 3.—Relation of life form rank to life form proportions on freelists of liked animals.
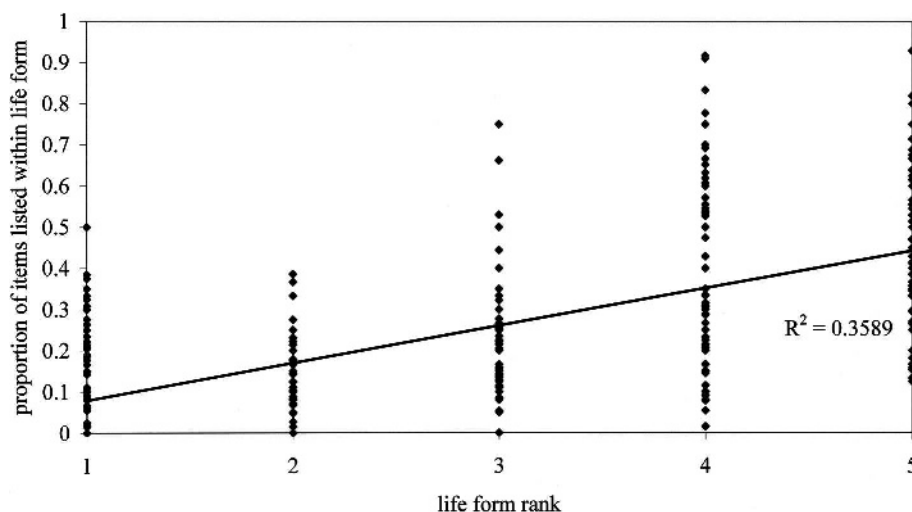
FIGURE 4.—Relation of life form rank to life form proportions on freelists of disliked animals.

form ranks and the proportion of life forms listed for disliked animals can be seen in Figure 4. The statistically significant correlation ($r = 0.559$, $p < 0.001$) between the ranks and freelist proportions of the life forms further demonstrates the interaction between cognition and affective meaning in the appropriation of ethnobiological knowledge.

Finally, our third hypothesis was also supported: the salience of the life forms was found to be concordant with their affective value for both liked and disliked animals. The rank of each life form was correlated with its corresponding salience value (B), as shown in Table 4. For both liked and disliked lists of creatures, the correlation coefficient is statistically significant for each of the life forms ($p < 0.001$ for all measurements). This discovery supports the proposition that semantic domains are graded and constructed in accordance with affective responses. These data therefore suggest that ethnobiological domains are cognitively assembled according to culturally constituted values, beliefs, and feelings about living things (e.g., Nolan 2002; Nolan and Robbins 2001; Robbins and Nolan 1997).

TABLE 4.—Correlation of life form ranks to freelist salience.

Life Form	Correlation	
	Liked	Disliked
Mammals	0.65	0.57
Birds	0.59	0.55
Fish	0.71	0.49
Snakes	0.61	0.51
Wugs	0.67	0.73

CONCLUSION

Taken in concert, these results collectively demonstrate that emotional responses comprise an important dimension in the retention and articulation of ethnobiological information. Anderson has already noted that

> Some amount of emotion enters into all information processing, and some amount of cognitive construction seems to enter into all human emotional experience (Anderson 1996:112).

In a similar vein, Plutchnik surmised that human cognition is contingent on affective responses, whereby information stored in the brain is activated through decisions and behaviors that ultimately serve as adaptations for human survival:

> An organism must predict on the basis of limited information whether there is food, a mate, or danger in its environment. Depending on the prediction made, the organism makes a decision to attack, run, play, or mate. From this point of view, the complex processes of sensory input, evaluation, symbolization, comparison with memory stores and the like—those processes we call cognitive—are in the service of emotions and biological needs (Plutchnik 1977:203).

If affective responses are designed to potentiate the retrieval of information about semantic domains, then ethnobiological cognition, by extension, is similarly guided by the emotions, feelings, and values associated culturally with living creatures.

Research in ethnobiology has been heavily influenced by the rigorous methodology of ethnoscience, and is presently sustained by a humanistic devotion to wildlife diversity, conservation, and sustainability. Despite this blend of science and humanism, however, much remains to be discovered about the interrelationship between cognitive and emotional processes and their relevance to human interactions with the natural world. Human-animal relationships, much like ethnoecological systems, are constantly in flux. In order for conservation strategies to succeed in any context, they must be informed by an understanding of shared beliefs about the perceived value and meaning of biota as a vital part of the human experience. Ethnobiologists must therefore continue to investigate the consequences of emotionality, which as we have shown, is a powerful force in the cognitive structuring of cultural domains. We hope our findings will initiate further exploration into the cultural, symbolic, and affective components of ethnobiological cognition and classification.

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