

"Wildlife in Costa Rican households - a nationwide survey"

A pictorial report

by

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Introduction

One manifestation of the relationship between society and wildlife is the keeping of animals at home. The motivations behind this practice may vary greatly between individuals and between cultures. But the consequence of keeping wildlife as pet is in most cases the same: the wellbeing of the animals is compromised. In contrast to domestic species, the movement and general behavior of wild animals need to be severely restrained in order to make its coexistence with people in a home environment possible. Concern for the wellbeing of the animals and the potential impact of a pet market on natural populations urge for a better understanding of wildlife keeping habits.

This report summarizes the main results of a nationwide survey about the keeping of wildlife in households, carried out in Costa Rica in 1999. The data presented are pertinent to the design and targeting of information in awareness initiatives that arise from humanitarian and conservation concerns. The results provide the platform for calculations of the magnitude of the national pet trade and an estimation of its potential impact on wild populations of these animals. This study seeks both to characterize the practice of keeping wild animals at home and to elucidate the reasons and social correlates of this habit. The report includes information such as incidence of wildlife in Costa Rican households, species involved and their fate, captivity conditions, acquisition process, reasons for keeping and not keeping wildlife, knowledge about the relevant laws, and perception of the cognitive abilities of animals². Domestic animals are referred to marginally in this report.

Data are shown graphically, with a brief comment of each result in a legend. Codes in the figures are not dependent on colors. The color plates can thus be reproduced in black & white without losing information.

² The results of a research module about the attitudes of Costa Ricans toward wildlife are omitted here.

Methods

Overview

<i>Coverage:</i>	nationwide
<i>Sample size:</i>	1021 households, 1021 adults, 177 minors
<i>Sampling error at $\alpha=0.05$:</i>	3.1% for $n=1021$ 7.4% for $n=177$
<i>Data collection:</i>	personal interviews
<i>Sampling period:</i>	16. March-6. May 1999
<i>Sample composition:</i>	48.8% male and 51.2% female adults, 47.8% urban and 52.2% rural settings
<i>Rejection rate:</i>	less than 15%

Details

Questionnaire design:

The project coordinator drafted the content of the questionnaire. It included questions about knowledge, attitudes and practices with respect to various topics: (1) general information about the respondent, (2) wildlife and nature related activities, (3) attitudes toward wildlife, (4) wildlife kept in the household (past and present experiences), (5) perception of cognitive abilities of animals and (6) knowledge of the law that regulates the keeping of wild animals at home. Two sociologists and Unimer Research International personnel reviewed form and structure of the questionnaire. The drafting stage included several trials and a final pilot study stage by the interviewers who were to collect the field data. The 14th version of the questionnaire was applied through personal interviews to the national sample. The majority of questions were closed. Cards were used to illustrate the options available to the respondent in some of the questions. A shorter version of the questionnaire for adults was used for minors.

Study population and sample:

The sample population of this study consisted of 1021 Costa Rican adults and their households. In addition, a smaller sample of 177 minors from age 9 to 17 years was selected to allow some comparisons with the sample of adults. The study population was to be representative at a nationwide level. The primary sampling unit was the census segment, i.e. a predefined set of about 40-60 households used as 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 its size, from the national total of 10535 segments of the 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. This system would yield usually five households sampled by each interviewer per segment in a day.

A pre-established quota for sex and age guaranteed that the sample did not depart significantly in these variables from the national demography. Only one adult was interviewed in each household. In some households, a minor was interviewed in addition to the adult, according to availability of the age and sex class specified in the quota. Quotas for adults were balanced with respect to sex ratio in each age class. The resulting overall sex ratio among adults interviewed was 48.8% male and 51.2% female. Class quotas were as follows (actual percentages in the sample are shown in brackets): 36% (35.7%) of 18-29 years, 52% (51%) of 30-49 years and 12% (13.3%) of 50 years or more. Quotas for minors were balanced with respect to sex ratio and of equal numbers in the three age categories 9-11, 12-15 and 16-17 years. The source for demographic information about Costa Rica for the calculation of quotas was the *Central American Population Program* of the University of Costa Rica (<http://populi.ucr.ac.cr>).

The socioeconomic level of each household was determined from Duncan's socioeconomic index³, which integrates information about the adult interviewed and about appliances found in the household. Three levels were discriminated in this study with the following representation in the sample: 57.9% low/middle-low, 35.3% middle, and 6.9% middle-high/high.

Households representing urban and rural segments were also chosen according to a quota based on the national distribution of these characteristics, yielding 47.8% urban and 52.2% rural households. These proportions approach the national distribution of these urbanization levels (48.3% urban vs. 51.7% rural, as reported by the *National Institute of Statistics and Census* for 1998).

The sampling error associated to the 1021 adults or households was 3.1% for a 95% confidence interval. The error associated to the 177 minors was 7.4%. The global error for the complete sample of 1198 questionnaires was 2.8%.

³ See Stevens *et al.* 1985. Socioeconomic indices and the new 1980 census occupational classification scheme. *Social Sciences Research* 14: 18-22.

Data collection and processing:

The marketing research company Unimer Research International (based in San José, Costa Rica) was given the task of collecting the data in the field, preparing the digital database and performing a subset of the foreseen analyses under the supervision of the project coordinator. Prior to departing to the field for the pilot study, the 16 interviewers and 5 group supervisors allocated to this study underwent a training session led by the project coordinator and Unimer's project administrator. Teams composed of four interviewers and a group supervisor visited households in the locations predetermined by the sample. This investigation was introduced to the potential respondent as "...a study about the relationship between Costa Ricans and nature". In 5.7% of the cases the interview was refused up-front. 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 average interview from a random subsample of cases lasted 34 minutes and 30 minutes for adults (range 20-55 min, n=55) and minors (range 17-69 min, n=48), respectively. The data were collected over a 52-day period, between 16. March and 6. May 1999.

The filled questionnaires were subject to an initial revision by the group supervisor in the field and then forwarded to Unimer's office. About one third of the interviews were confirmed by the project administration through telephone calls to respondents. Open questions were codified and the questionnaire checked again for completeness and consistency prior to their entry into a digital database in SPSS Inc. format. The database was checked for outlying and extreme values and inconsistencies. In addition, the contents of the database and the questionnaires were cross-checked in a subsample of 30 cases. The statistics software package SPSS Version 8.0 was used for the analyses and Microsoft Excel for graphical representations. A confidence interval of 95% was used in all tests ($\alpha=0.05$).

Results

1. Incidence and species

Proportion of households currently with
wildlife in Costa Rica (1999)

23.5%

n = 1021 households

(95% confidence interval: 20.4%-26.6%)

43.8%

of the households keep currently or
have kept previously wild animals.

(95% confidence interval: 40.7%-46.9%)

Fig. 1. Proportion of households with wildlife in the Costa Rican sample. In about one out of four households people take care of at least one wild animal, including mammals, birds, reptiles, amphibians, fish or invertebrates. Nearly half of the families have kept wildlife at some point.

*“What do you keep the [wild]
animal for?”*

*n=240 adults... in households which
currently keep wildlife*

**AS A PET
(98%)**

**AS A GIFT / FOR CONSUMPTION
/ FOR SALE (2%)**

Fig. 2. Reason for keeping a wild animal at home. The vast majority of respondents keep their wild animal as a pet. This coincides with the finding that upon being asked *"Is there a pet in this household?"* only 5% responded "No", when later in the interview it was documented that they did keep wildlife at home.

Incidence of various species of domestic animals in Costa Rican households

Animal	% Households	Association with wildlife pet
<i>Dog</i>	53.0	+ (***)
<i>Chicken</i>	20.3	+ (**)
<i>Cat</i>	14.8	+ (**)
<i>Cattle</i>	6.2	
<i>Budgerigar/Cockatiel</i>	4.8	+ (**)
<i>Horse</i>	4.5	
<i>Pig</i>	4.4	
<i>Canary</i>	4.1	+ (***)
<i>Rabbit</i>	3.2	
<i>Goldfish</i>	2.7	+ (***)
<i>Duck</i>	2.5	+ (***)
<i>Goose</i>	1.8	+ (**)
<i>Turkey</i>	1.6	
<i>Hamster or guinea-pig</i>	1.1	
<i>Goat</i>	1.1	
<i>Pheasant</i>	0.6	
<i>Sheep</i>	0.4	
<i>Peacock</i>	0.3	

Fig. 3. Incidence of various species of domestic animals in Costa Rican households. Percentages do not add up to 100 since a given household may have more than one of the listed species. The most commonly kept domestic species are dogs, chicken and cats. Several domestic animals are significantly, positively associated with the occurrence of wildlife pets in the same household. Among households with domestic animals, 28.5% keep wildlife, whereas only 14.5% of households without domestic animals keep wildlife. Statistical significance levels are shown by *.

Incidence of 15 most commonly mentioned species among wild animals in Costa Rican households

SPECIES	TOTAL	%
1. Green parakeet	119	49.6
2. Parrot	62	25.8
3. Other wild bird	35	14.6
4. Fish (not gold fish)	27	11.3
5. Turtle in fish tank	19	7.9
6. Other turtle	15	6.3
7. Other wildlife	10	4.2
8. Macaw	2	0.8
9. Iguana or Ctenosaur	2	0.8
10. Agouti	2	0.8
11. White-tailed deer	2	0.8
12. Toucan	1	0.4
13. Spider monkey	1	0.4
14. Howler monkey	1	0.4
15. Spiders or insects in terrarium	1	0.4
N = 240 households with wildlife	299	

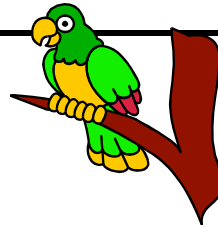


Fig. 4. Frequency of most commonly kept wild species from a list of predetermined answers. Some households keep more than one species. Birds –mostly parakeets and parrots - are the most common pet wildlife. The most commonly kept psittacids are the Orange-chinned Parakeet (*Brotogeris jugularis*) and three species of *Amazona* in similar proportions (Red-lored Parrot *A. autumnalis*, White-fronted Parrot *A. albifrons* and Yellow-naped Parrot *A. auropalliata*).

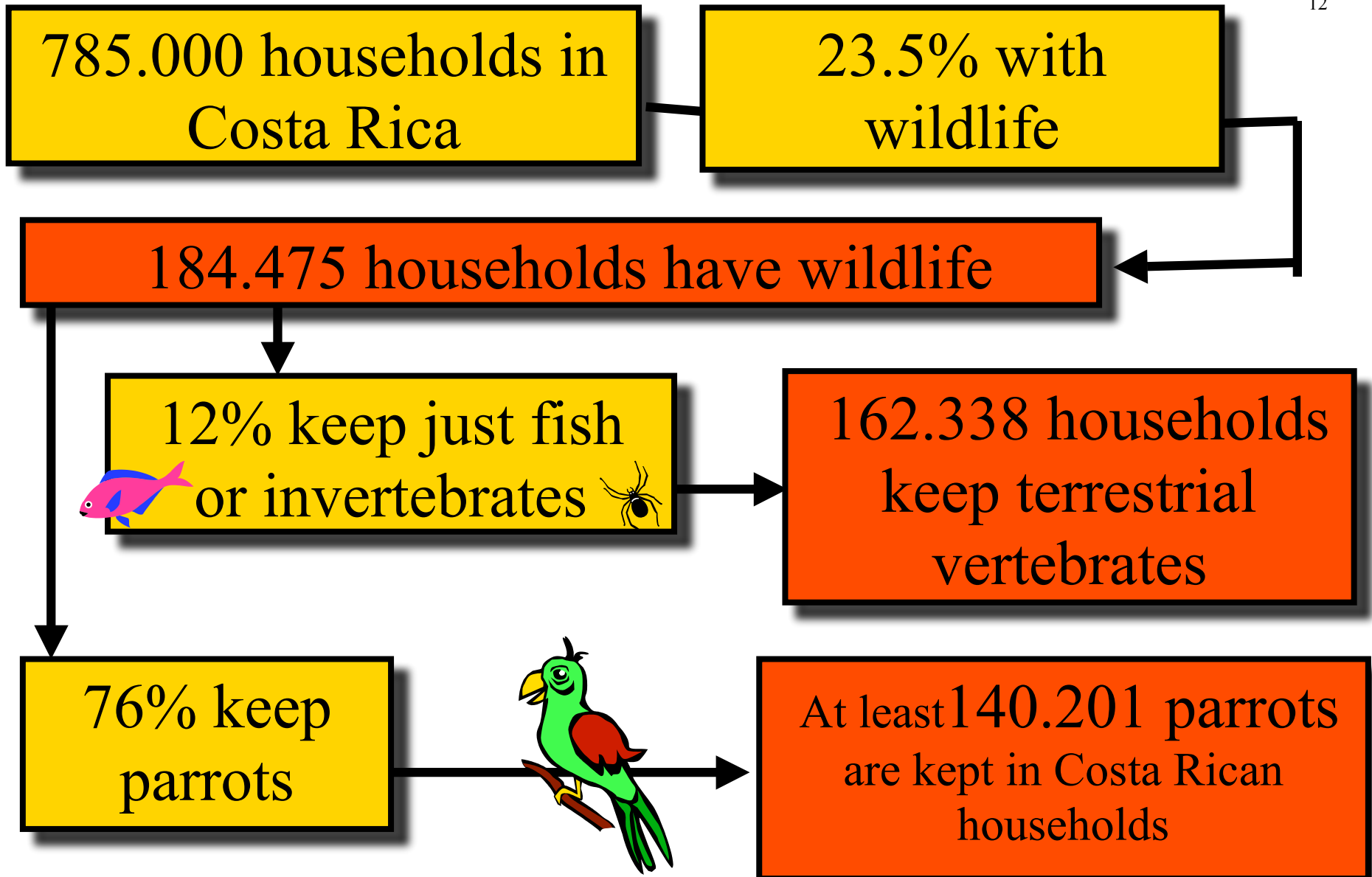


Fig. 5. Approximate numbers of terrestrial vertebrates kept in Costa Rica. Numbers are extrapolations from the proportions found in the sample of this study. “Parrots” stands here for any species of psittacid (parrots, parakeets and macaws).

Species and specimen totals per household

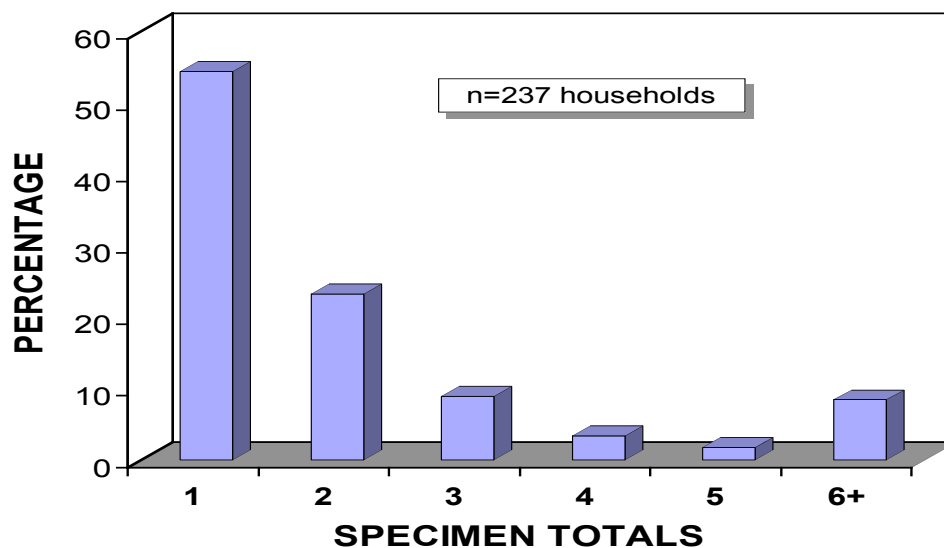
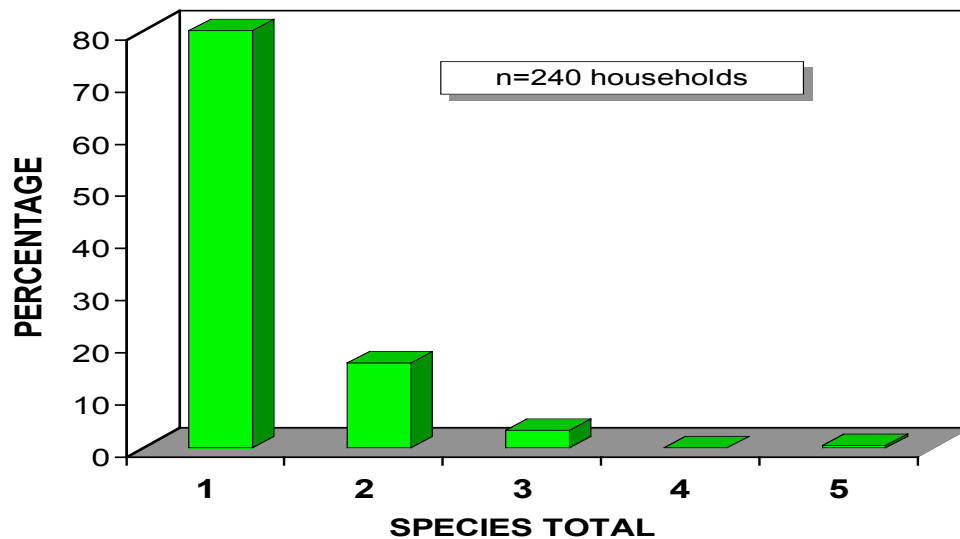


Fig. 6. Species and specimen totals per household. The vast majority of households with wildlife keep one individual of just one species of animal. People who keep songbirds and ornamental birds (other than parrots or parakeets) tend to keep more than one individual, typically two. In households with an aquarium the median number of fishes kept was four.

2. Reasons for keeping and not keeping wildlife

"Please mention two reasons, in order of importance, why you keep wild animals at home."

- Table shows frequencies for first mention only -

MAIN REASON	%
<i>They are nice / We like them</i>	30.0
<i>We got them as a gift</i>	14.2
<i>To stimulate the children</i>	5.8
<i>Our child wants us to keep it</i>	5.8
<i>To protect them and take care of them</i>	4.6
<i>For leisure</i>	3.8
<i>They have sentimental value</i>	2.9
<i>Because they sing</i>	2.5
<i>They are lovable</i>	2.1
<i>We found it injured</i>	2.1
<i>For company</i>	2.1
<i>n=240 adults</i>	75.9%

Fig. 7. Main reason for currently keeping wild animals at home. This item was an open question in the interview. All of the remaining 24.1% of answers had less than 2% representation in the sample.

Level of agreement with the statement
“Keeping wild animals at home favors in the children an attitude of respect and love for nature.”

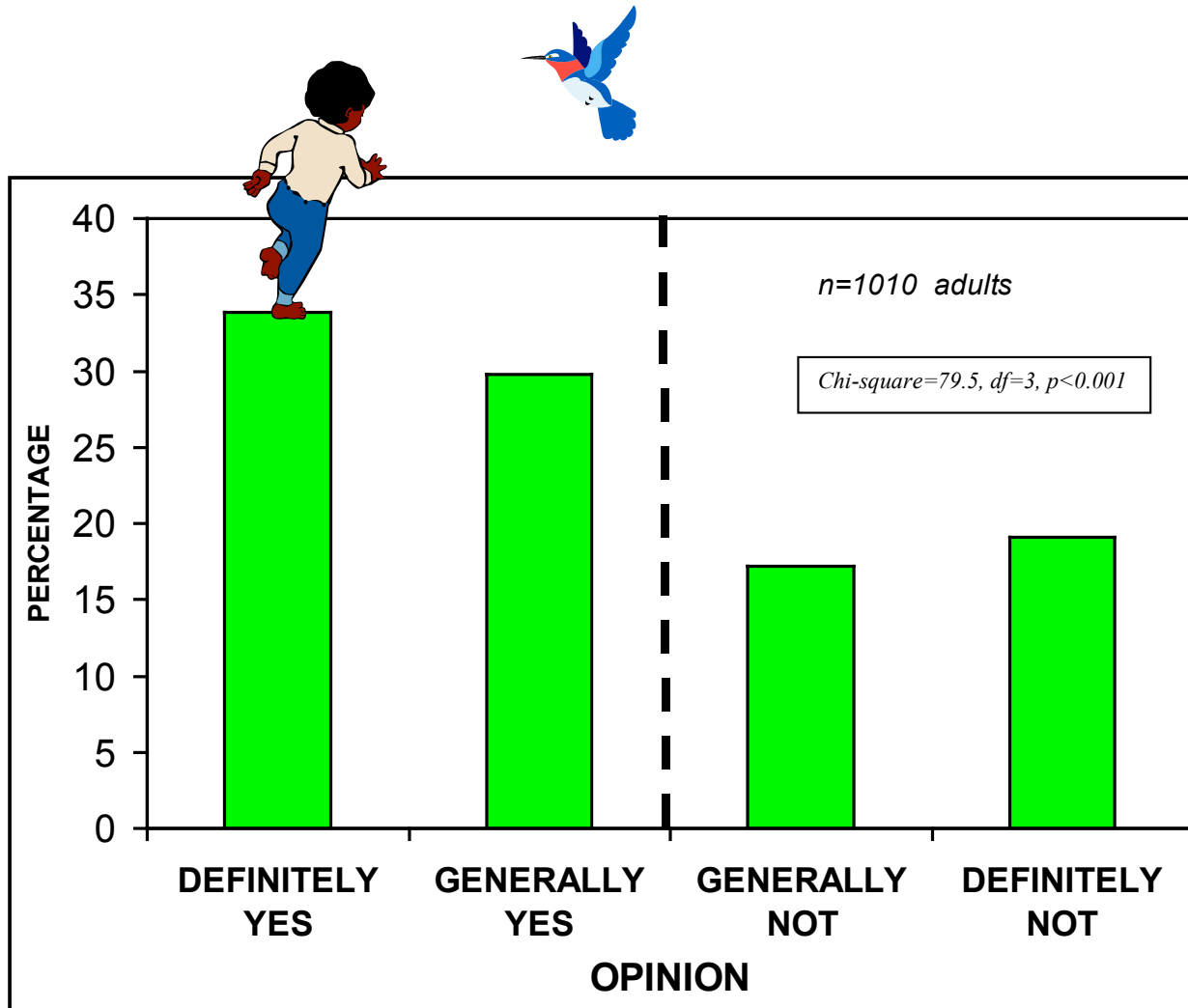


Fig. 8. Opinion with respect to the statement *“Keeping wild animals at home favors in the children an attitude of respect and love for nature”*. The majority (63.7%) of adults agreed with the statement. There was no significant difference between sexes or between adults and minors in this item. 1.1% of the 1021 interviewees had no opinion about this item or did not answer the question.

“Do you think that keeping wild animals at home makes the people better known in the neighborhood?”

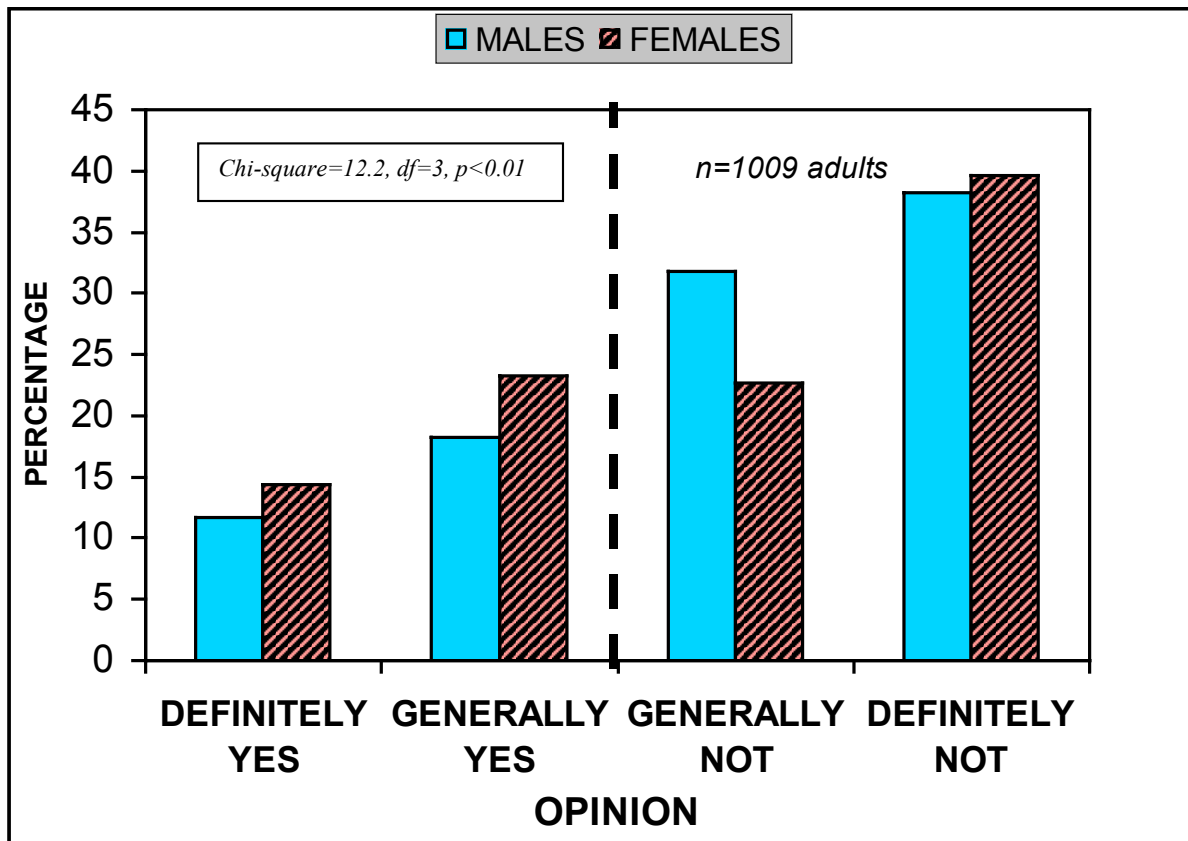


Fig. 9. Opinion with respect to the question *“Do you think that keeping wild animals at home makes the people better known in the neighborhood?”* The majority (66.1%) of adults disagreed with the statement. There was a statistically significant difference between sexes of adults in this item: a slightly greater proportion of females than males agreed with the statement. 1.3% of the 1021 interviewees had no opinion about this item or did not answer the question.

"Why don't you have currently wild animals at home?"

- One or two reasons were recorded for this item -

	REASONS	%	TYPE
1.	<i>I do not like to keep wild animals in captivity</i>	19.4	Principle
2.	<i>I do not have enough space here</i>	12.5	Logistics
3.	<i>I prefer the animals to be free</i>	9.1	Principle
4.	<i>Animals need a lot of care / I cannot take care of them</i>	8.4	Logistics
5.	<i>I do not have time for it</i>	7.5	Logistics
6.	<i>Animals should be in their natural habitat</i>	6.5	Principle
7.	<i>I do not like them</i>	5.3	Affinity
8.	<i>It is forbidden</i>	3.6	Legal
9.	<i>I could not keep them</i>	2.6	Logistics
10.	<i>My place is not appropriate</i>	2.4	Logistics
11.	<i>Animals are happy if they are free</i>	2.1	Principle
12.	<i>It is cruel</i>	2.0	Principle
13.	<i>They are difficult to get</i>	2.0	Logistics
<i>n = 891 answers among 574 adults</i>		83.4	

Fig. 10. Main reasons for not having wild animals at home among 574 adults who have never kept wild animals at home (56.2% of 1021 adults of the total sample). A matter of principle represents 39.1% of the reasons mentioned, whereas logistical considerations account for 35.4% of the answers.

“Would you mention two reasons why, in general, people in Costa Rica decide to keep a wild animal as a pet?”

CURRENTLY KEEPS WILDLIFE	HAS NEVER KEPT WILDLIFE
1. THEY LIKE THEM	1. THEY LIKE THEM
2. THEY ARE NICE	2. AS A LUXURY ITEM
3. FOR COMPANY	3. FOR COMMERCIAL TRADE
4. TO PLEASE THEIR CHILDREN	4. THEY ARE NICE
5. FOR ENTERTAINMENT	5. TO IMPRESS
6. FOR COMMERCIAL TRADE	6. FOR ENTERTAINMENT
7. THEY ARE DIFFERENT	7. FOR COMPANY
8. AS A LUXURY ITEM	8. AS HOME DECORATION
9. FOR FUN	9. THEY ARE DIFFERENT
10. TO TAKE BETTER CARE OF THEM	10. FOR FUN
11. BECAUSE OF IGNORANCE	11. TO PLEASE THEIR CHILDREN
12. TO GIVE THEM LOVE	12. BECAUSE OF IGNORANCE
<i>n=413 answers among 240 adults</i>	<i>n=969 answers among 574 adults</i>

Fig. 11. Twelve most common reasons reported by interviewees for why Costa Ricans in general keep wild animals as pets. Answers are ordered from highest to lowest frequency. Although most reasons are common to both groups, adults who have never kept wild animals as pets and those who currently keep wildlife, the groups differ with respect to the relative importance attributed to these reasons.

3. Care and captivity conditions of the animal

“Do you keep you favorite wildlife pet in the company of conspecifics?”

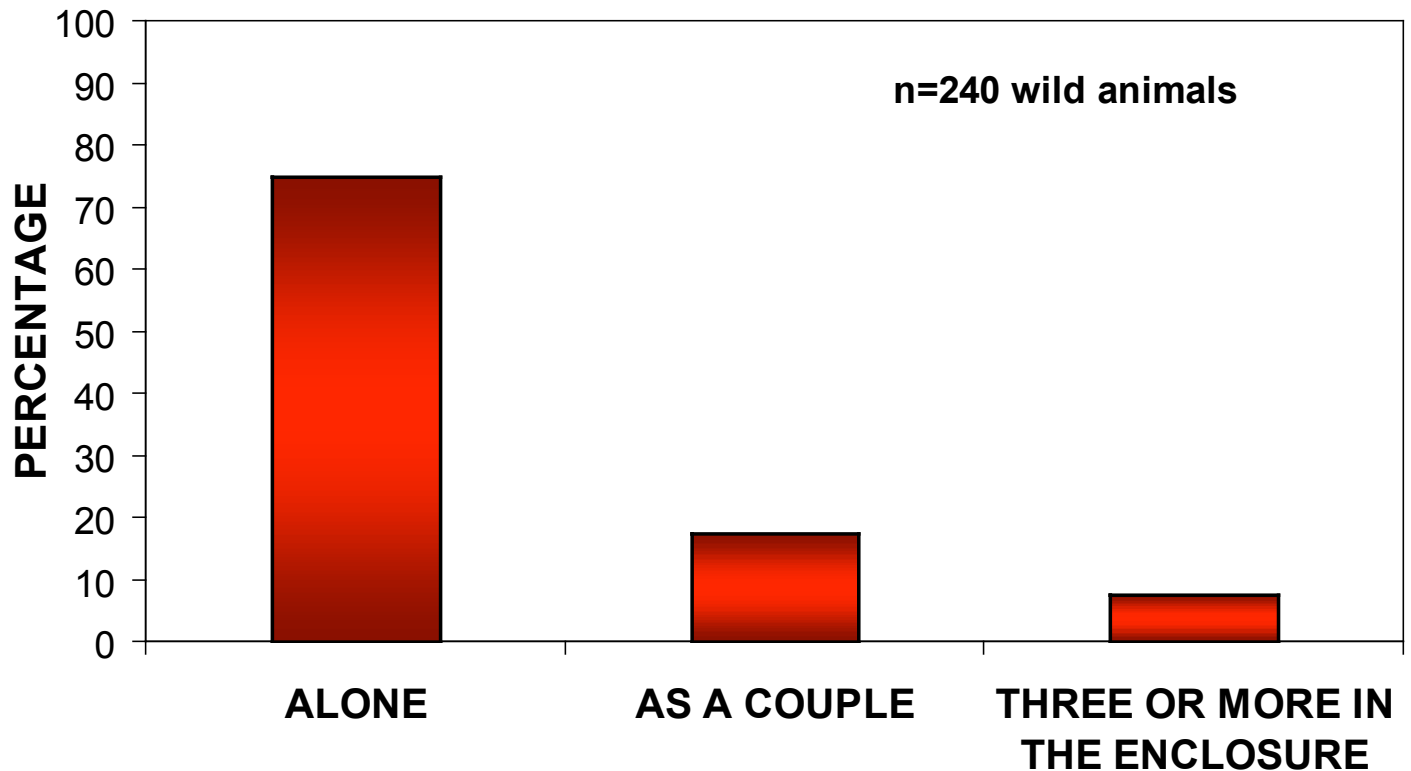


Fig. 12. Social condition of the favorite wildlife pet. Most animals are kept singly in their enclosure.

Veterinary care of wildlife pets

n=240 households with wildlife

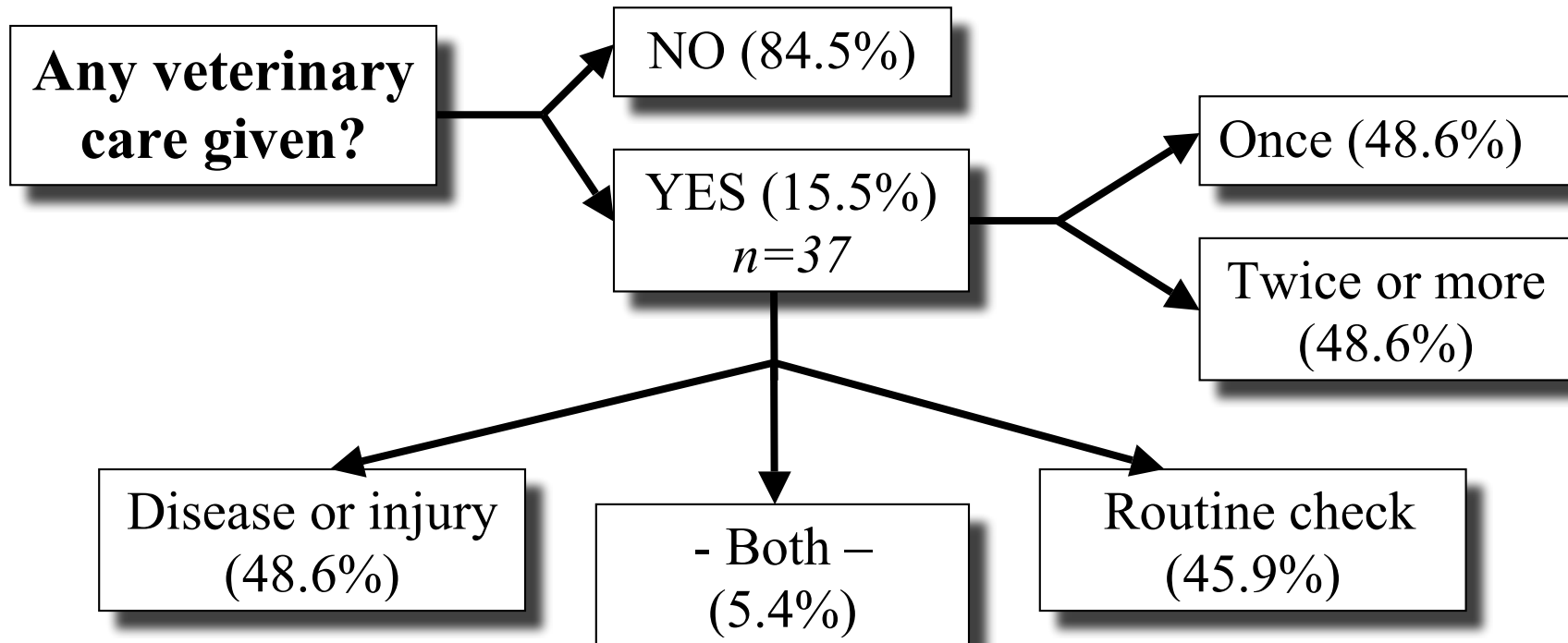


Fig. 13. Incidence of veterinary care among wild animals kept as pets. The vast majority has never been given any veterinary care.

Injuries caused by pet wildlife

n=446 adults who kept or currently keep a wild animal as a pet

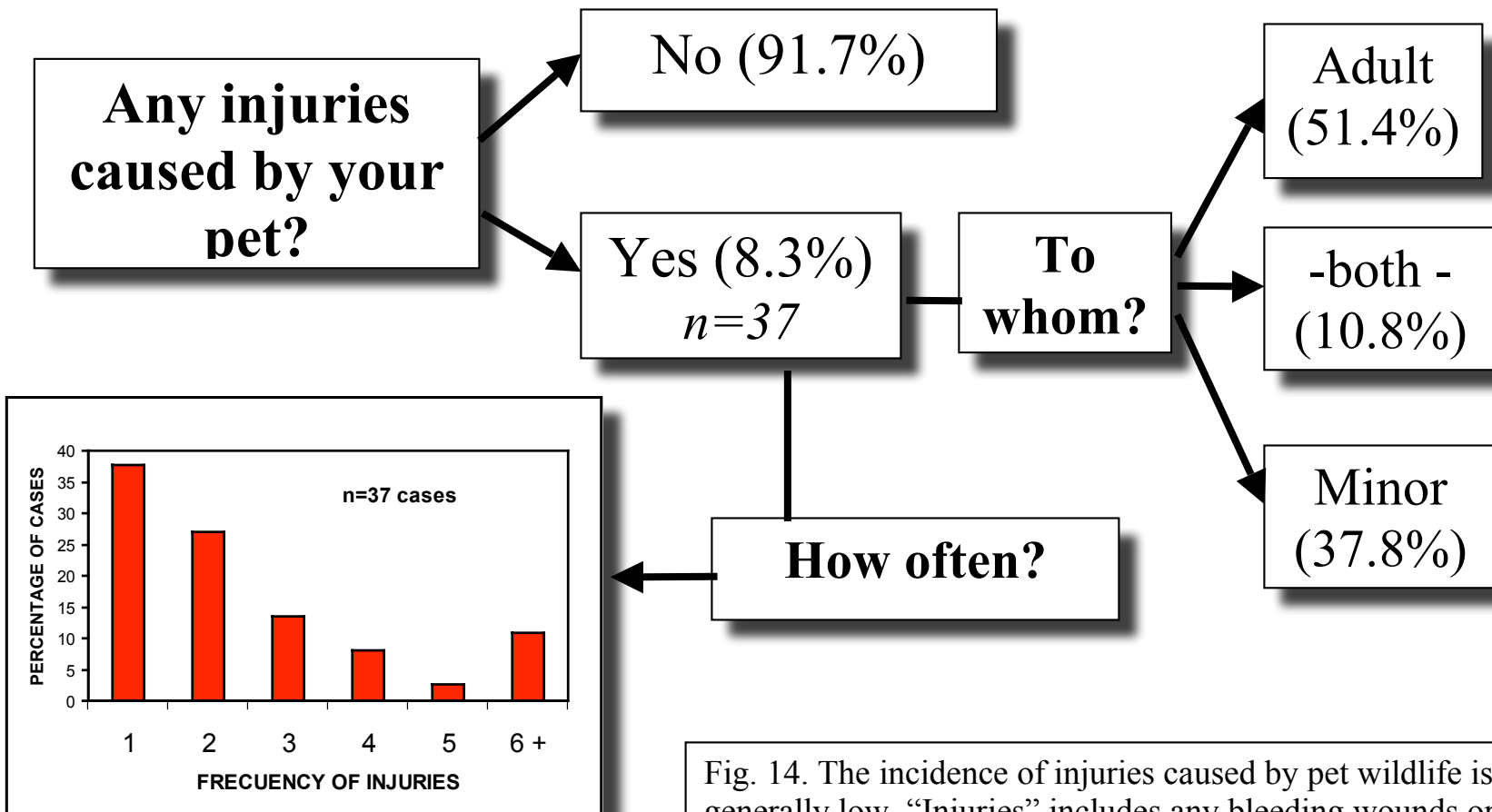


Fig. 14. The incidence of injuries caused by pet wildlife is generally low. “Injuries” includes any bleeding wounds or poisonous stings.

Captivity condition of favorite pet wildlife

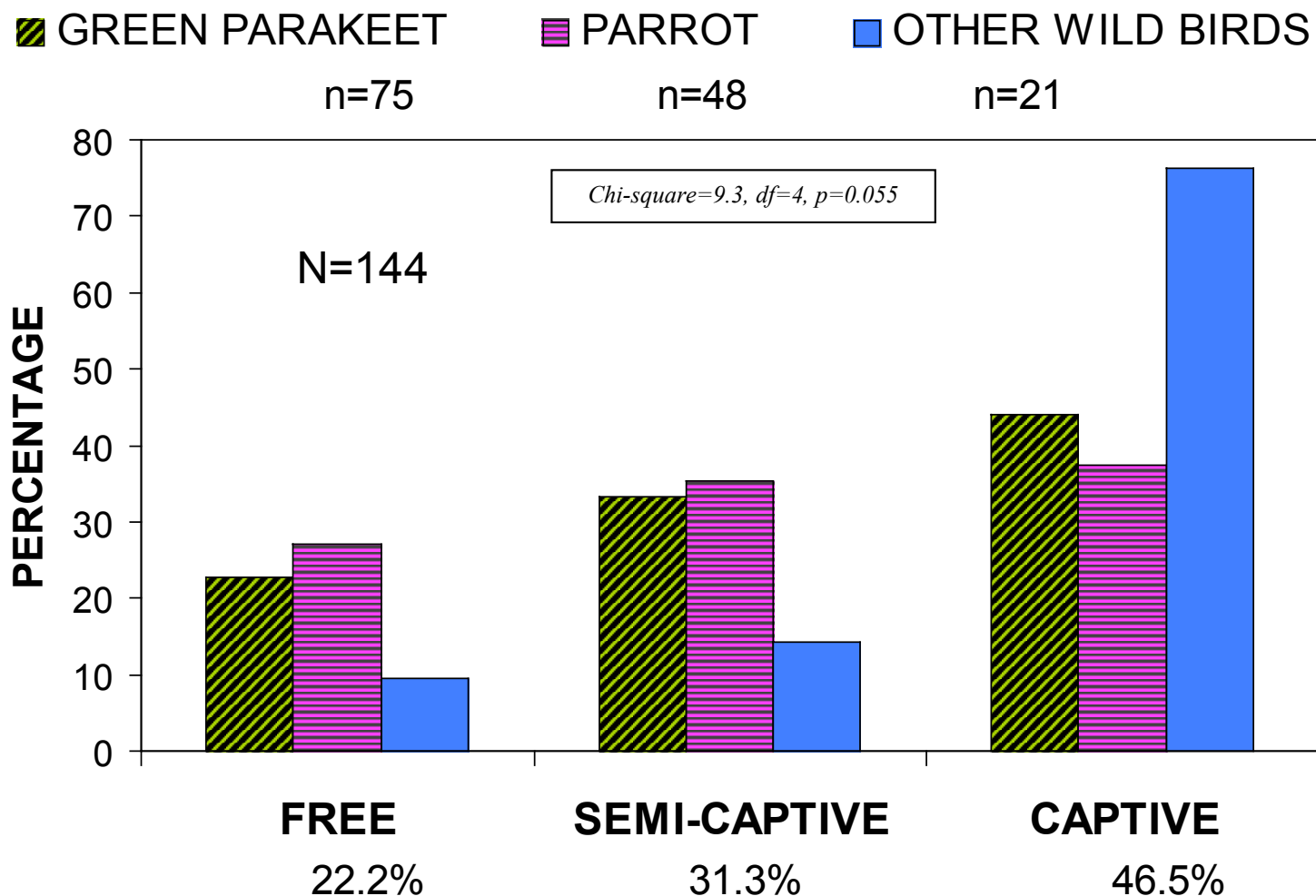


Fig. 15. Captivity condition of favorite pet wild bird currently kept. Free pets are fed by people but can come and go as they like. Semi-captive animals have some restriction of movement (e.g. clipped wings). Captive pets are typically in a cage or tied to an object. The proportion of free and semi-captive birds among parrots and parakeets is (non-significantly) higher than among other wild birds kept (e.g. songbirds or other ornamental birds).

Size of the enclosure of the favorite wildlife pet kept currently

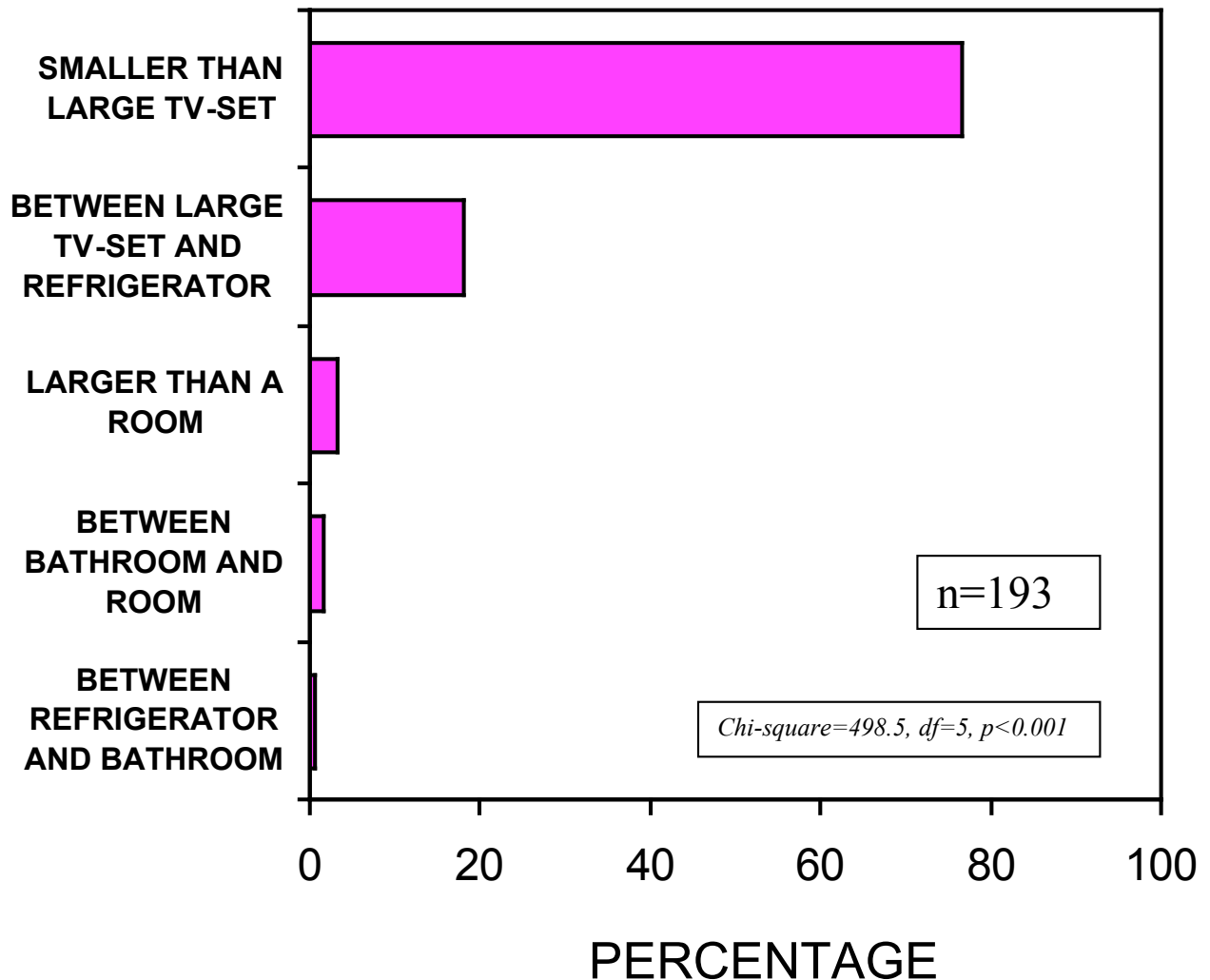


Fig. 16. Size of the enclosure of the favorite pet wildlife currently kept. In 76.7% of the cases the enclosure was smaller than a large TV-set.

“How do you think that the animals living in your home feel?”

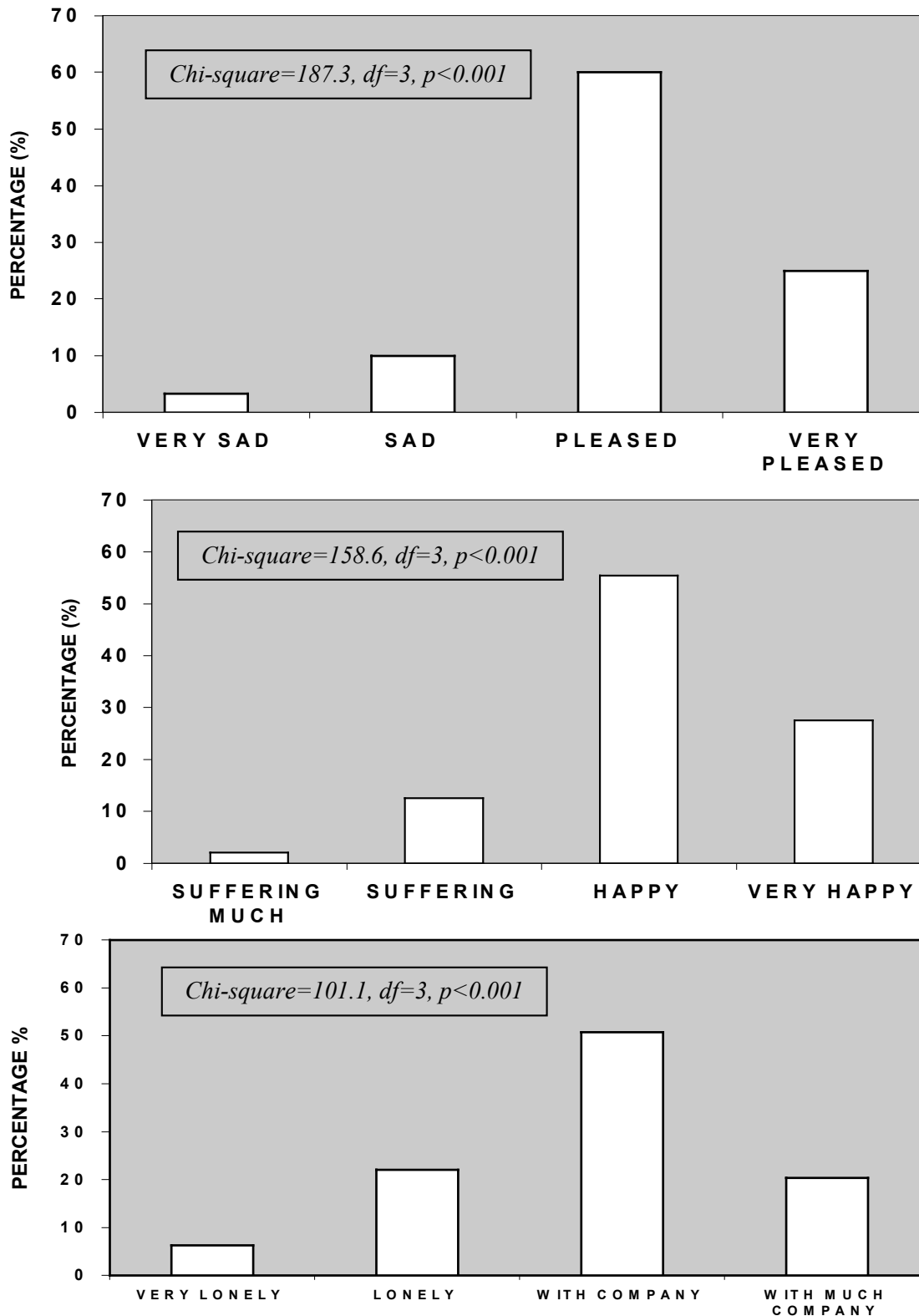


Fig. 17. Owner's opinion about their pet's welfare (n=240 adults). In general, owners state that their pet wildlife is happy, pleased and not lonely.

4. Variables associated with households that keep wildlife

Socioeconomic level and incidence of households with wildlife

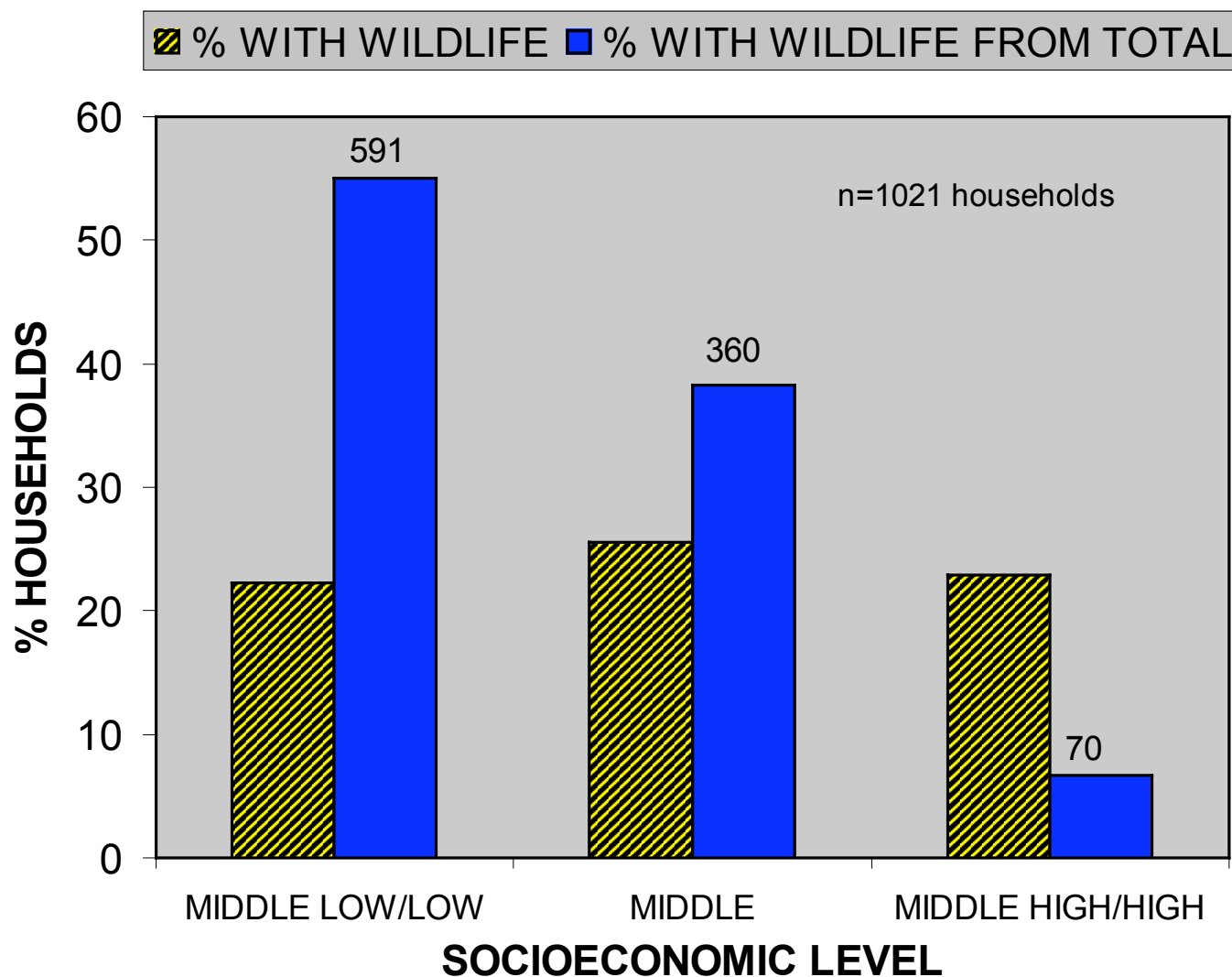


Fig. 18. Relationship between socioeconomic level of the household and the keeping of pet wildlife. The relative proportion of households with wildlife did not differ significantly between the three socioeconomic levels. The overall proportion of households with wildlife from the total sample, however, was highest among the middle low/low level households since these levels encompass the majority of households in Costa Rica.

Incidence of households with wildlife by degree of urbanization

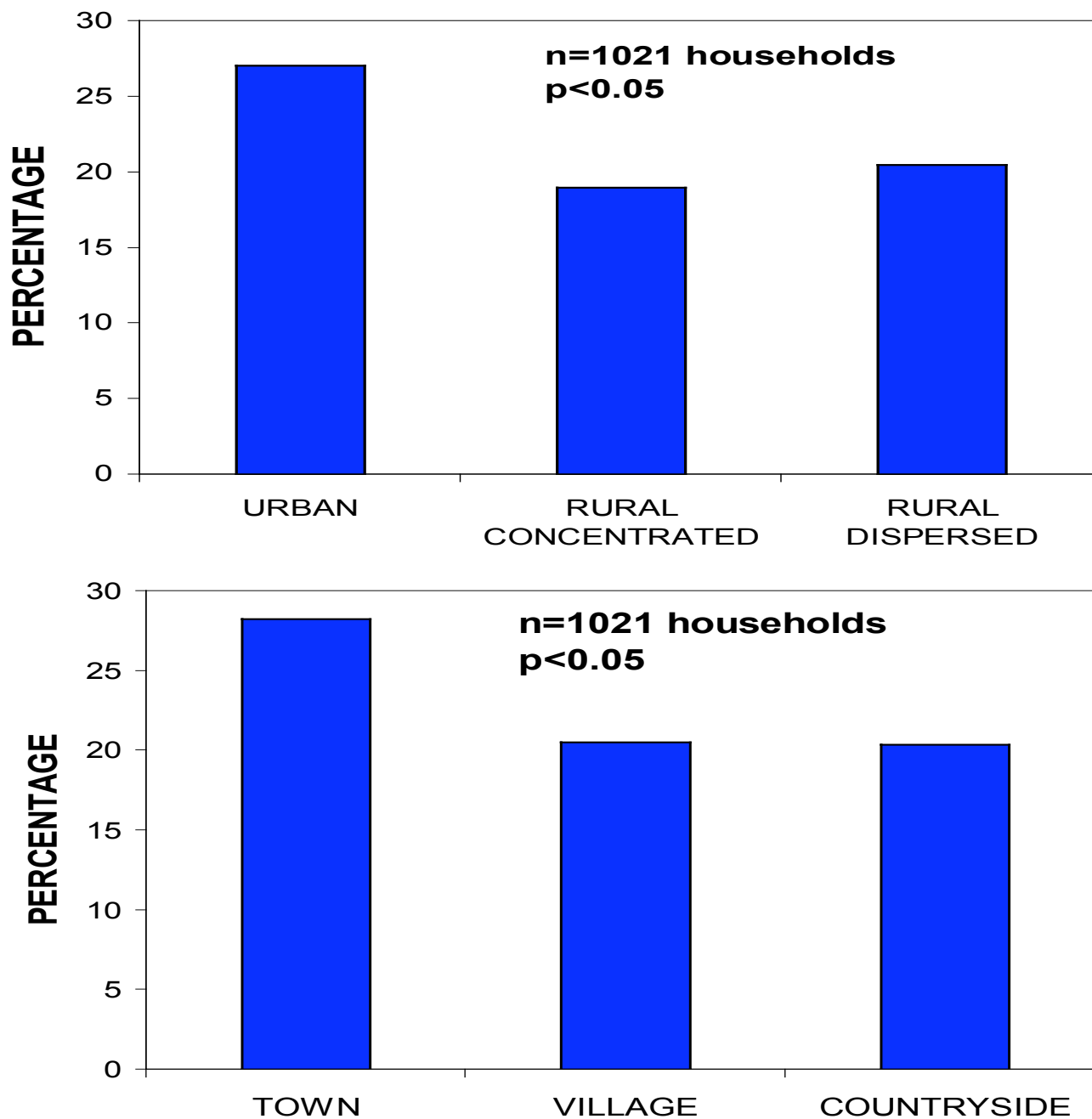


Fig. 19. Proportion of households with wildlife in various rural and urban settings. The incidence of households with wildlife differs significantly between these settings: households in urban environments are more likely to have wildlife than in rural settings.

Proportion of households with wildlife in urban and rural settings from the total sample

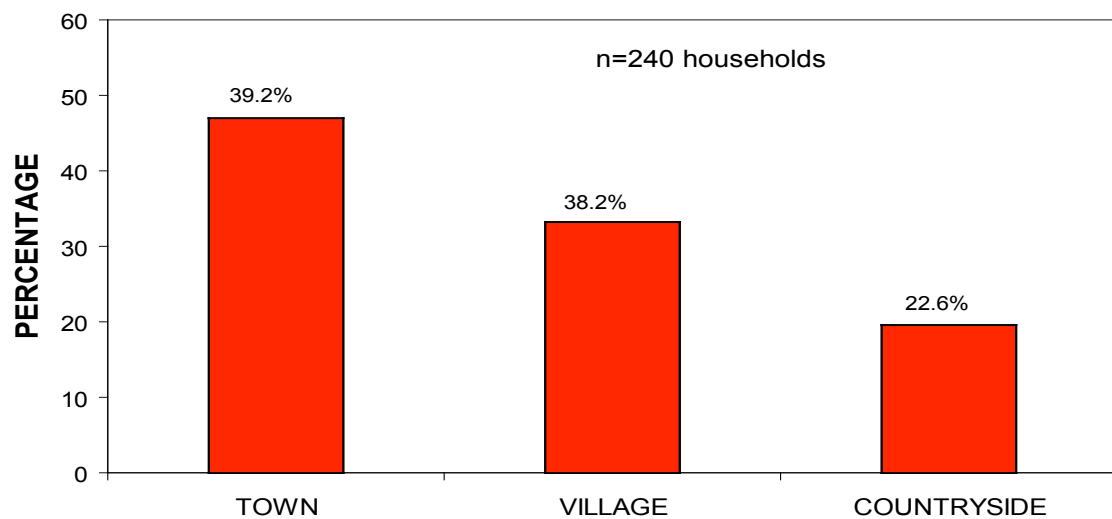
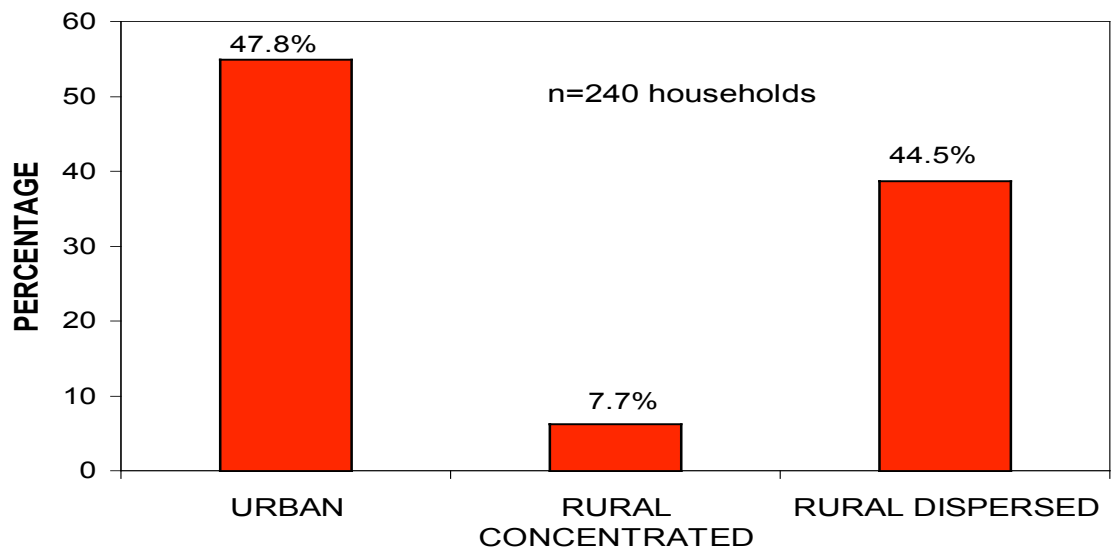


Fig. 20. Proportion of households with wildlife from the total sample ($n=240$ households with wildlife) in various rural and urban settings. The majority of households with wildlife are found in urban environments. The proportion of households in each setting in the total sample ($n=1021$ households) is shown in brackets on each bar.

Incidence of households with wildlife by availability of garden

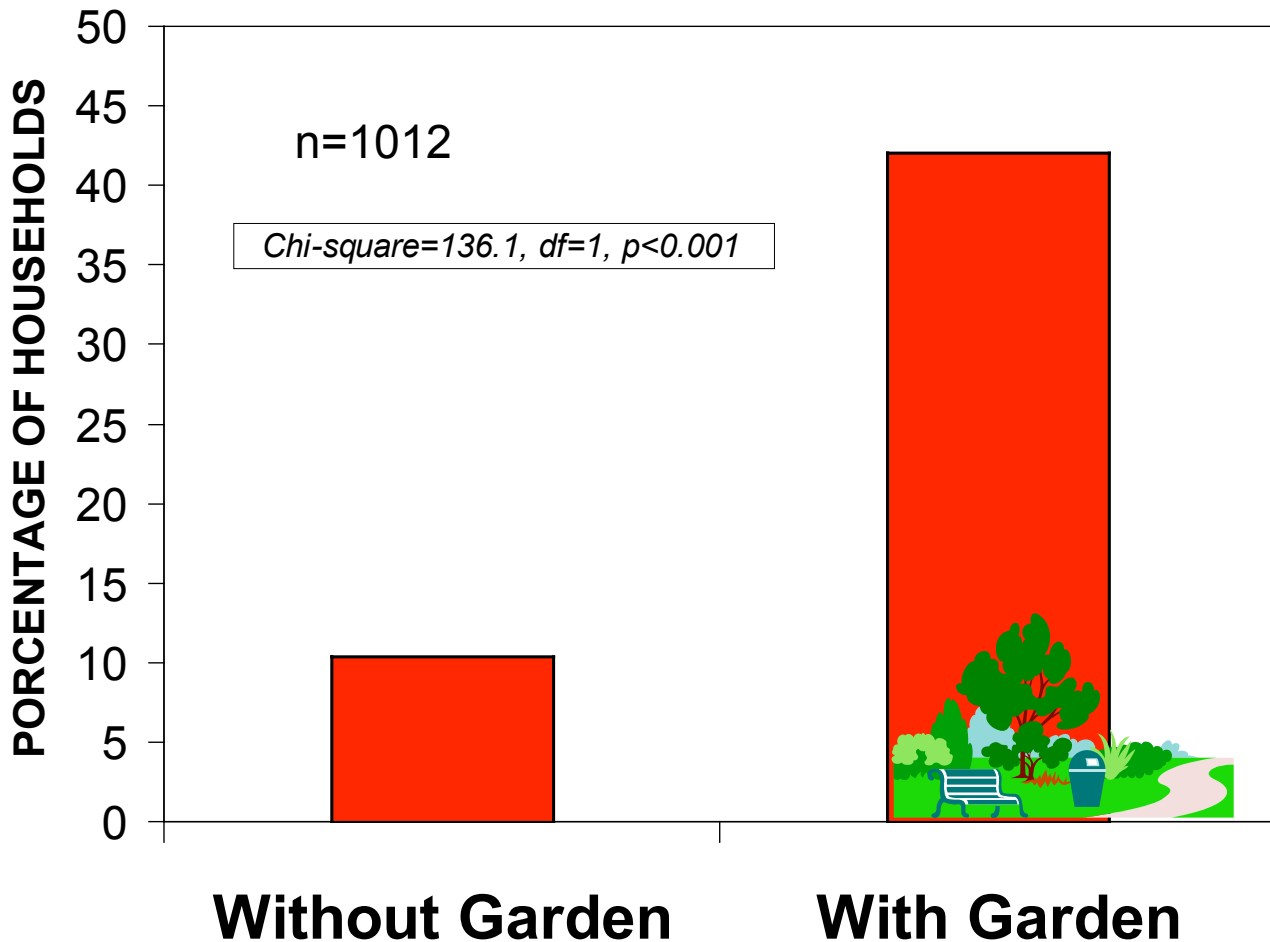


Fig. 21. Incidence of households with wildlife as a function of presence or absence of a garden. There is a fourfold probability that the owners keep wildlife if their house has a garden than if it does not. In the sample, 41% of the households had a garden.

Current keeping of wildlife as a function of having had wildlife at home as a child

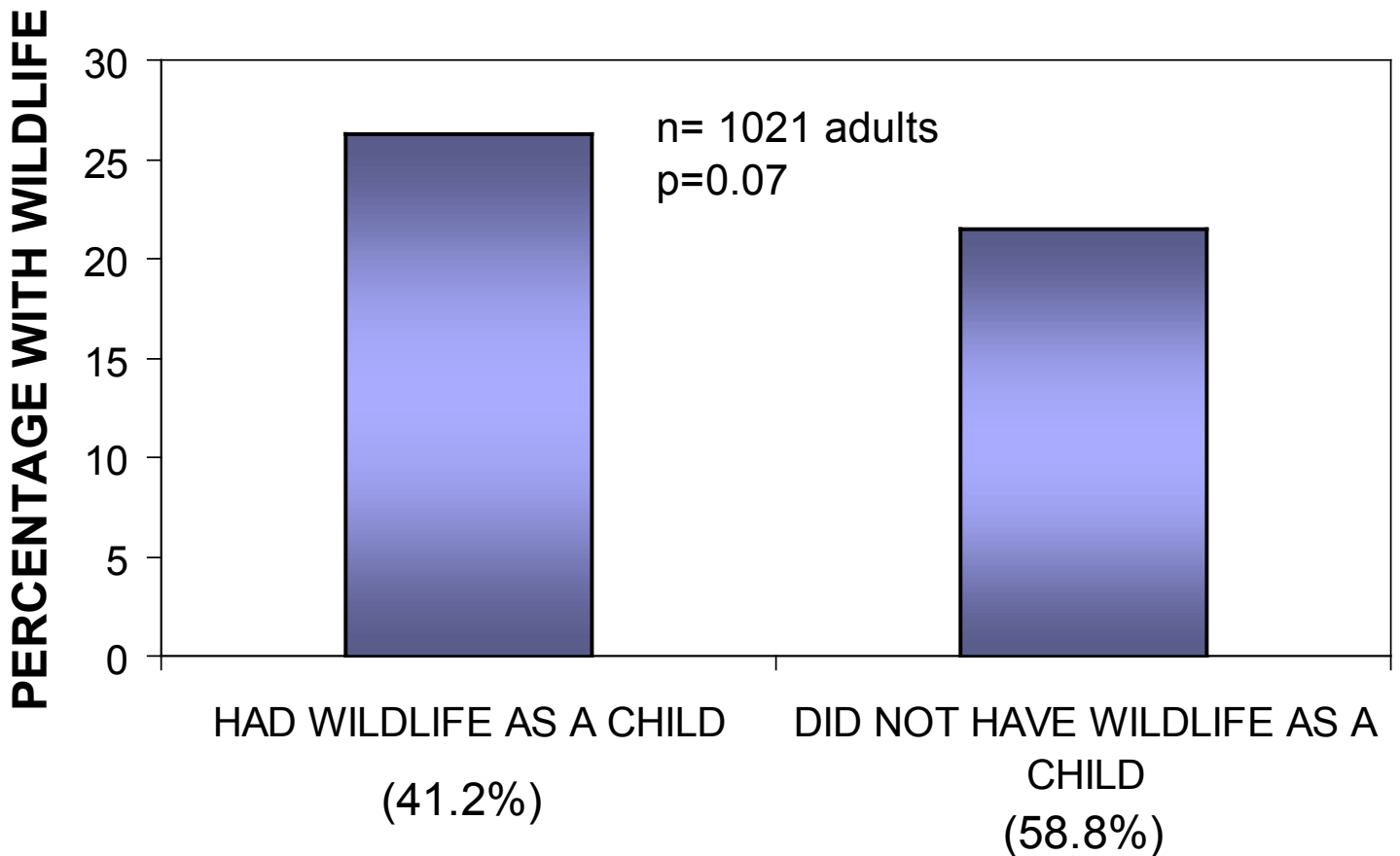


Fig. 22. Proportion of adults currently keeping wildlife as a function of whether or not they had wildlife at home as a child. The percentage of adults in each group is shown in brackets. The proportion of adults currently keeping wildlife is slightly higher if they had wildlife at home as children, but this difference is not statistically significant. However, having had wildlife during childhood, did increase significantly from 40% to 49.2% the probability of keeping wildlife at some point during adulthood ($Chi\text{-square}=8.45, df=1, p<0.01$).

Profile of household with wildlife

- Variables for which a statistically significant effect on incidence of wildlife was found -

Low probability of having wildlife	HIGH probability of having wildlife
<ul style="list-style-type: none"> - Rural setting - Without garden - Domestic animals absent - No wildlife at home during childhood - <i>Cultural region:</i> Lower Talamanca, Northern Atlantic 	<ul style="list-style-type: none"> - Urban setting - Garden present - Domestic animals present - Wildlife at home during childhood - <i>Cultural region:</i> Central Pacific, Northern Guanacaste

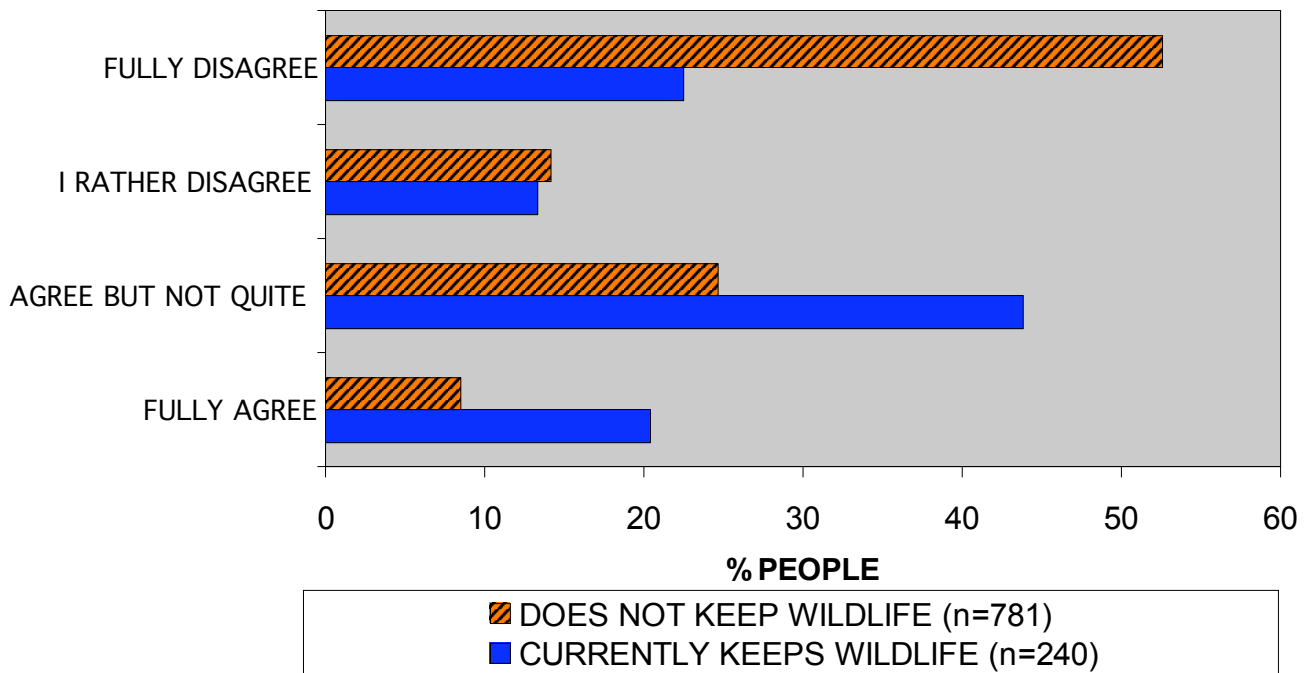
Variables with no significant effect on incidence of wildlife at home:

socioeconomic level, conservation area, geographic region, presence of minors, family size, urban v.s rural upbringing of adults.

Fig. 23. Profile of household with wildlife.

5. Attitude toward keeping wildlife as pets

Level of agreement with the statement
“In my opinion it is o.k. that people keep wildlife at home”
 among those who keep currently wildlife and those who do not



Chi-square=82.8, df=3, p<0.001

Fig. 24. Proportion of adults who agree or disagree with the statement *“In my opinion it is o.k. that people keep wildlife at home”* among those who keep currently wildlife and those who do not. The proportion that disagrees with the statement is significantly higher among adults who do not keep wildlife (66.8%) than among those who do (35.8%). The overall proportion of people from the total sample who disagree with the statement is 59.5%, without any significant difference between sexes.

Level of agreement with the statement
“In my opinion it is o.k. that people keep wildlife at home”
 among respondents of various ages

Chi-square=67.0, df=15, p<0.001

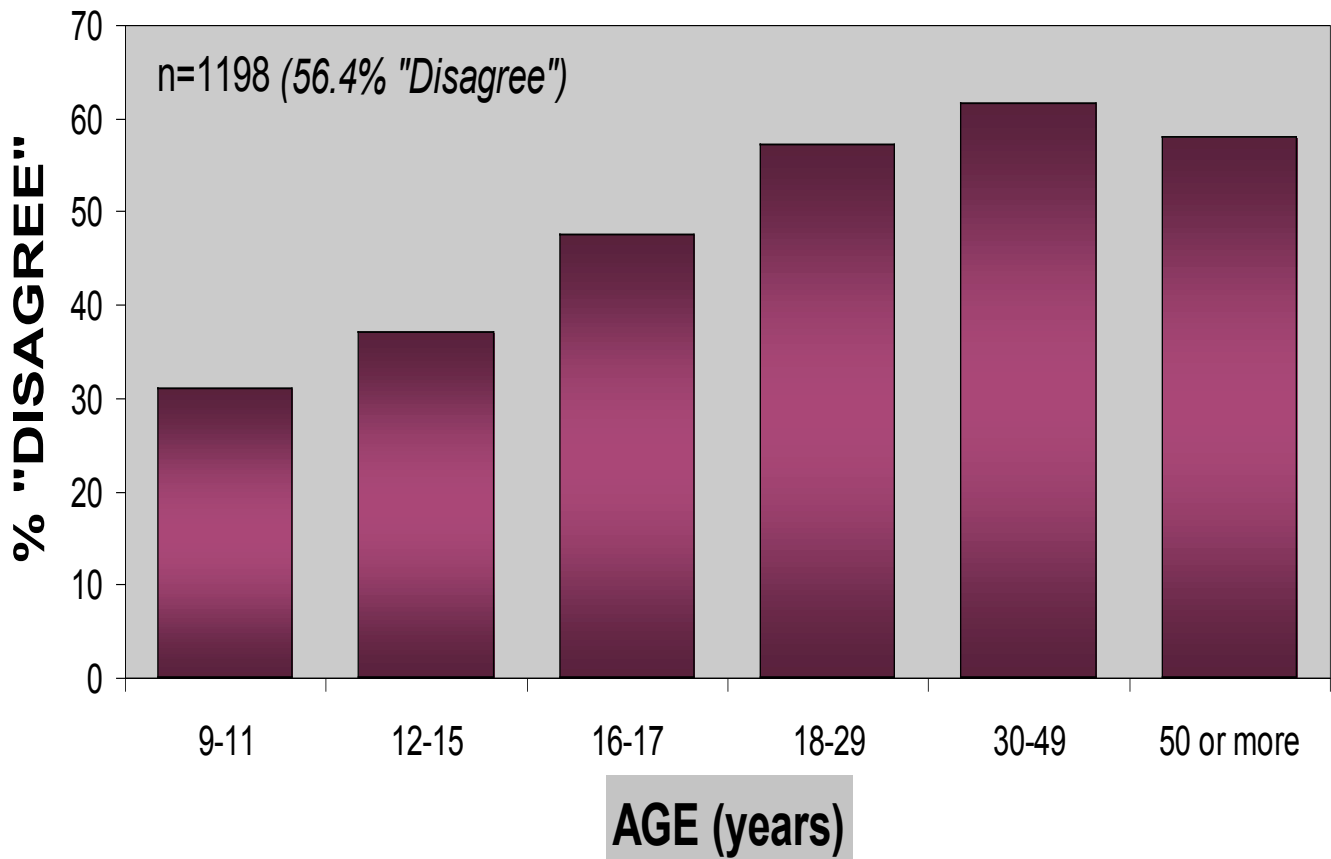


Fig. 25. Proportion of respondents who disagree with the statement *“In my opinion it is o.k. that people keep wildlife at home”* by age. The proportion of respondents who disagree with the statement among 9-11 year olds, the youngest of the sample, is nearly half that of the adults. This proportion increases steadily with age towards adulthood. The data may suggest a progressively increasing awareness about ethical arguments against the keeping of wildlife at home. Alternatively, however, the data could be associated with young people being more likely to give pleasing answers to the adult interviewer, and therefore to readily “agree” with the statement presented.

Level of agreement with the statement
“In my opinion it is o.k. that people keep wildlife at home”
 among three socioeconomic strata

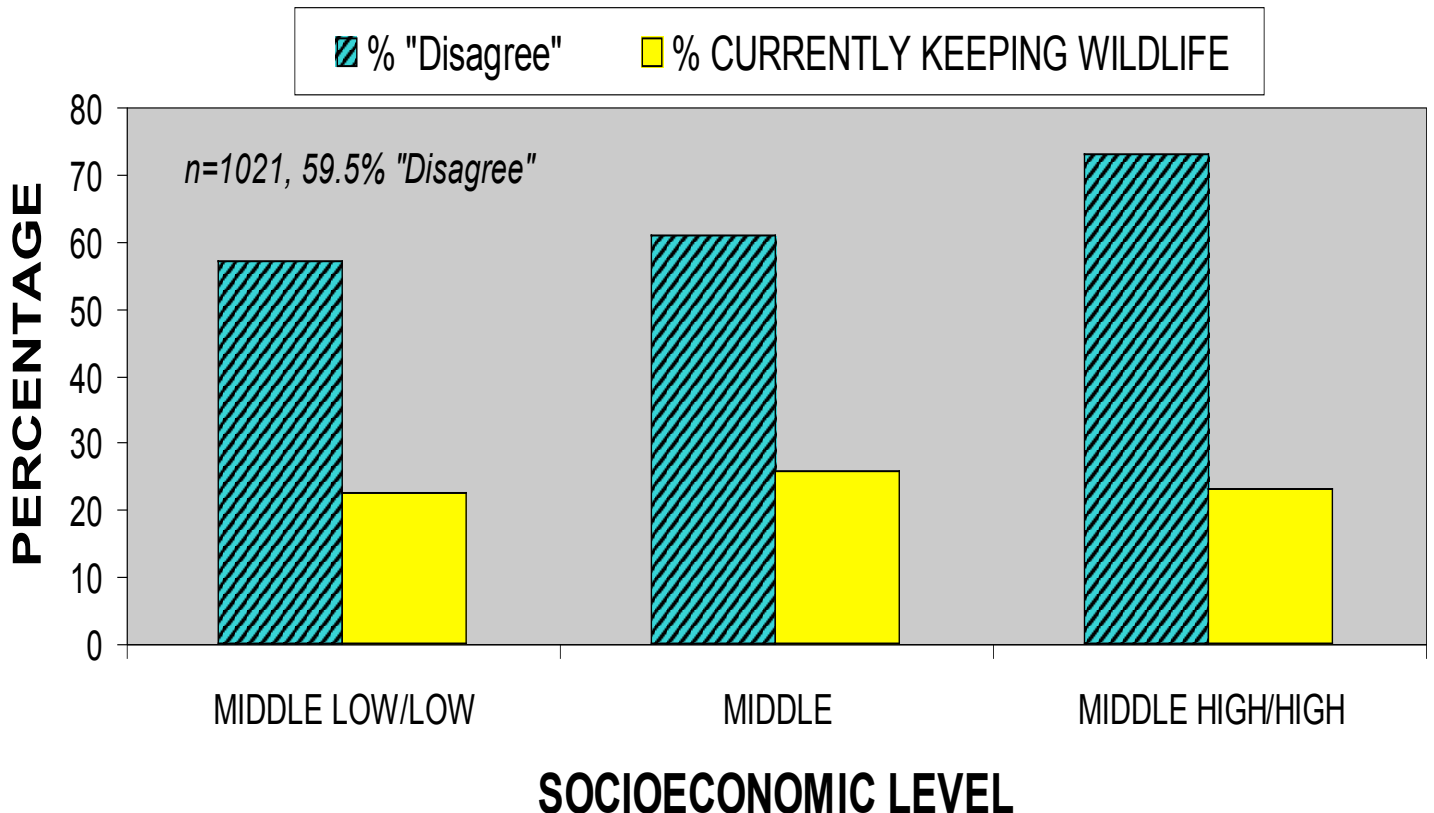
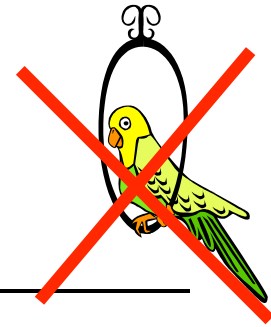


Fig. 26. Proportion of respondents who disagree with the statement *“In my opinion it is o.k. that people keep wildlife at home”* by socioeconomic level. The proportion of respondents who disagree with the statement increases from 57.1% for middle low/low to 72.9% for middle high/high*. Nevertheless, the proportion of households with wildlife does not differ significantly between these groups, suggesting that a predominant attitude against keeping wild pets does not necessarily translate into lower incidences of this practice.

* $\text{Chi-square}=15.8, \text{df}=6, p<0.05$

Main reasons why people disagree with the statement
*“In my opinion it is o.k. that people keep wildlife
 at home”*

n=877 (adults and minors)



Answers to an open question

-
1. *They are free creatures*
 2. *They should not be captive*
 3. *They should be in the forest*
 4. *It is not their habitat*
 5. *They could be dangerous for the children*
 6. *It is not appropriate for the animals*
 7. *They are endangered*
 8. *It is not correct*
-

Fig. 27. Main reasons why people disagree with the statement *“In my opinion it is o.k. that people keep wildlife at home”*. Seven out of eight reasons are based on ethical or ecological considerations.

Main reasons why people “agree but not quite”
with the statement
*“In my opinion it is o.k. that people keep wildlife
at home”*

n=362 (adults and minors)

Answers to an open question

	Reason	%
1.	<i>There are people who do not take good care of the animals</i>	18.5
2.	<i>As long as there is a place to take care of the animals and feed them</i>	15.2
3.	<i>Wild animals should not be held captive</i>	11.6
4.	<i>Wild animals are free</i>	11.3
5.	<i>Wild animals belong in the forest</i>	5.0
6.	<i>Some animals can live in captivity, some cannot</i>	4.7
7.	<i>They are nice</i>	3.6
8.	<i>Lack of adequate space</i>	3.0
9.	<i>It is not the animal's habitat</i>	3.0
10.	<i>They are endangered</i>	2.8
11.	<i>There are people who like wild animals</i>	2.8
12.	<i>Affection for pets</i>	2.2
13.	<i>Wild animals can be dangerous to children</i>	1.9
14.	<i>Wild animals are not taken good care of</i>	1.9
15.	<i>Wild animals should not be hurt</i>	1.7
16.	<i>It is not appropriate for the animals</i>	1.1
Total %		90.3

Fig. 28. Main reasons why respondents "agree but not quite" with people keeping wildlife at home. Most reservations with the statement reflect concern for the welfare of the animals or emphasize their right to be free.

Main reasons why people “fully agree” with the statement
“In my opinion it is o.k. that people keep wildlife at home”

n= 160 (adults and minors)

Answers to an open question

	Reason	%
1.	<i>They are nice</i>	23.8
2.	<i>As long as there is a place to take care of the animals and feed them</i>	22.5
3.	<i>It is entertaining for the children</i>	11.3
4.	<i>Wild animals are company</i>	9.4
5.	<i>Wild animals bring something special to the house</i>	8.1
6.	<i>Affection for pets</i>	4.4
7.	<i>There are people who like wild animals</i>	3.8
8.	<i>Nature is valued</i>	3.1
9.	<i>Those people have another way of life</i>	3.1
	Total	89.4%

Fig. 29. Main reasons why respondents "fully agree" with people keeping wildlife at home. The main reasons are that, as long as animals are taken adequate care of, it is o.k. to keep them because they are nice, have entertainment value for children and provide company.

6. Attribution of feelings to animals

Proportion of respondents who attribute various feelings to macaws in the wild

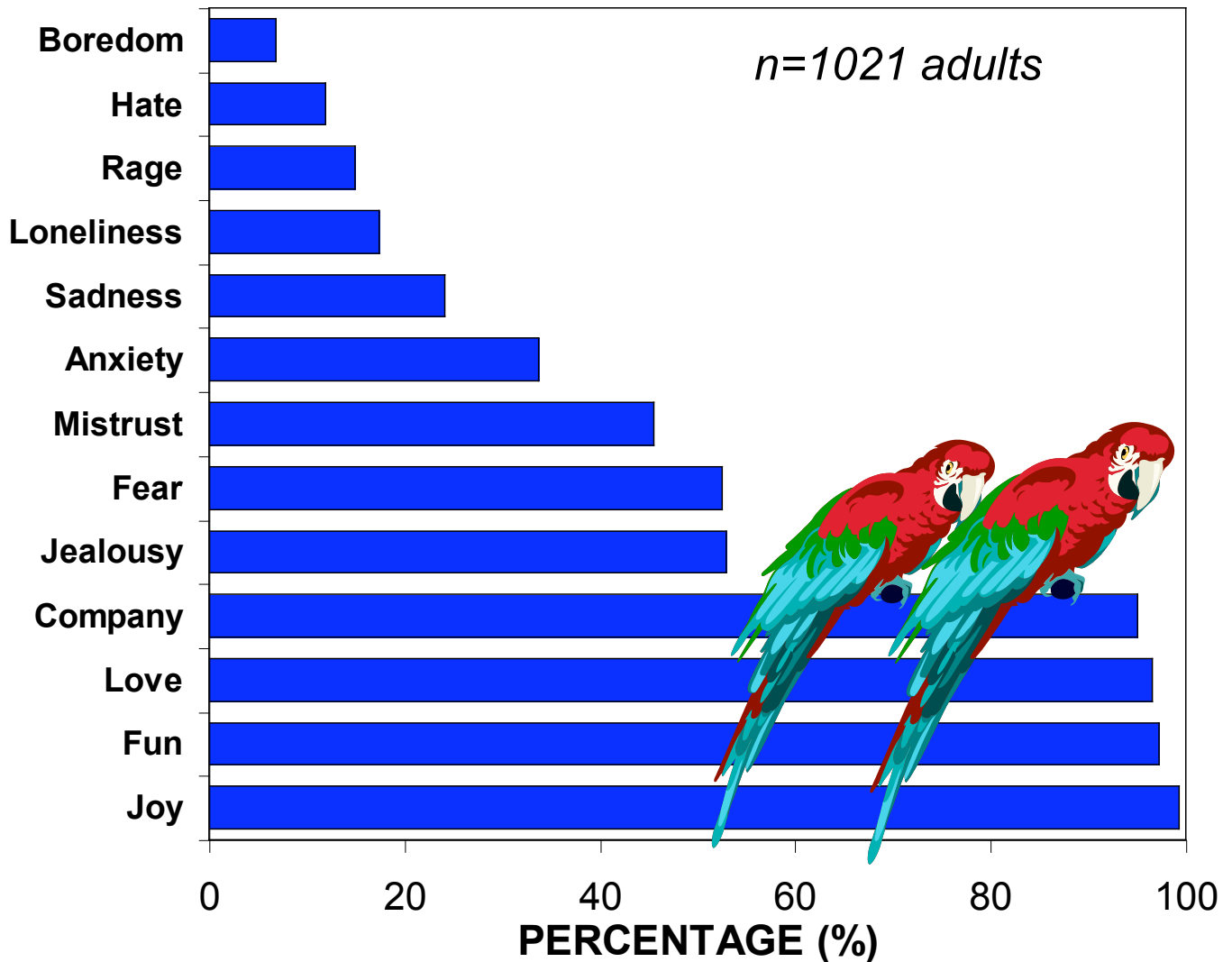


Fig. 30. Proportion of respondents who attribute various feelings to macaws in the wild. Feelings are ordered by frequency. Positive feelings (joy, fun, love and company) are attributed to wild macaws by over 95% of respondents. In contrast, much fewer respondents attribute negative feelings to macaws.

Proportion of male and female adults who attribute to macaws various feelings that these birds may have toward humans

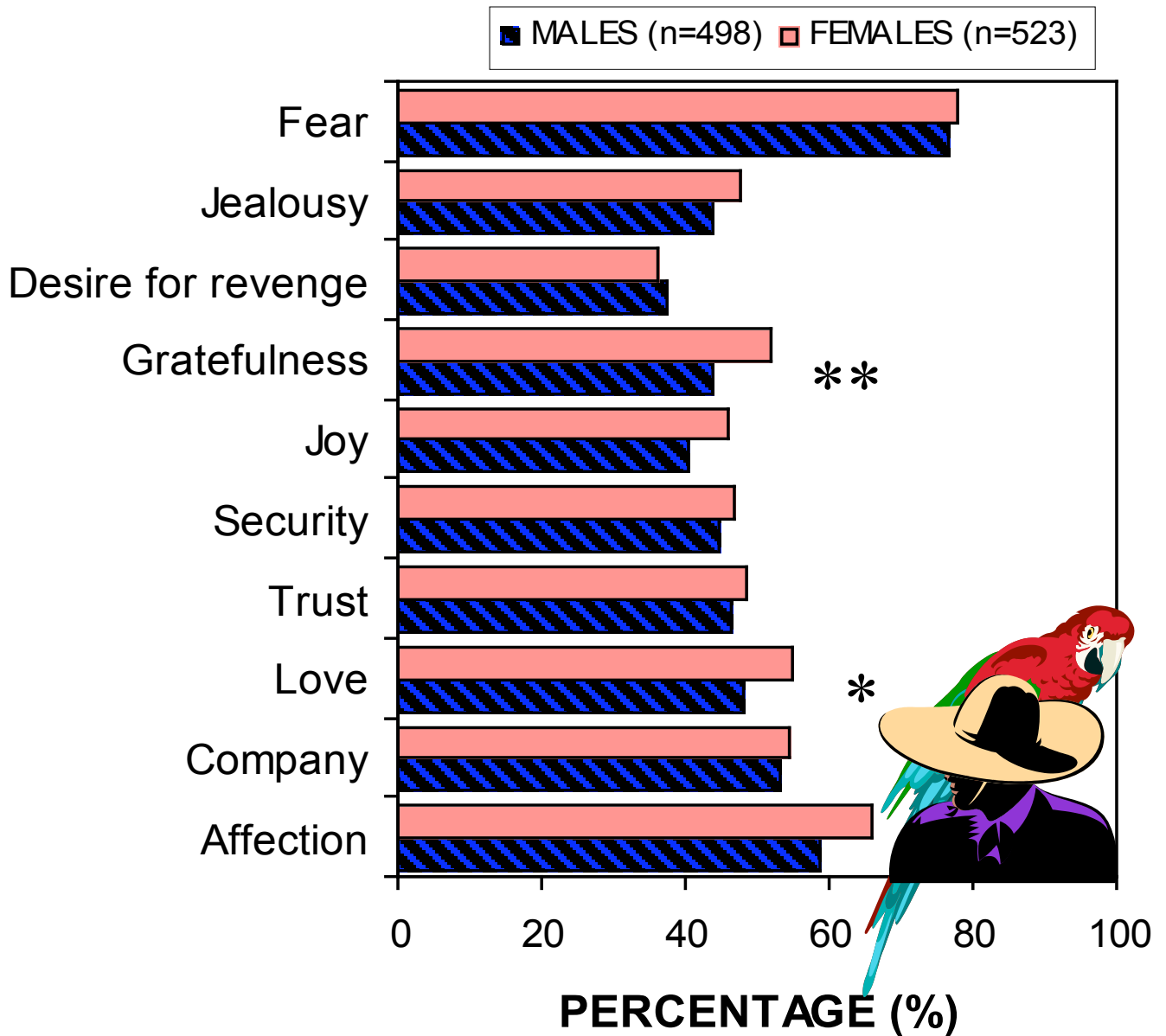


Fig. 31. Male and female perception of feelings that macaws may have toward humans. The figure shows frequencies of choice by adult respondents from a given list. Overall, female respondents attribute slightly more feelings to macaws than males. Significant differences between sexes are indicated by *.

Proportion of adults and minors who attribute to macaws various feelings that these birds may have toward humans

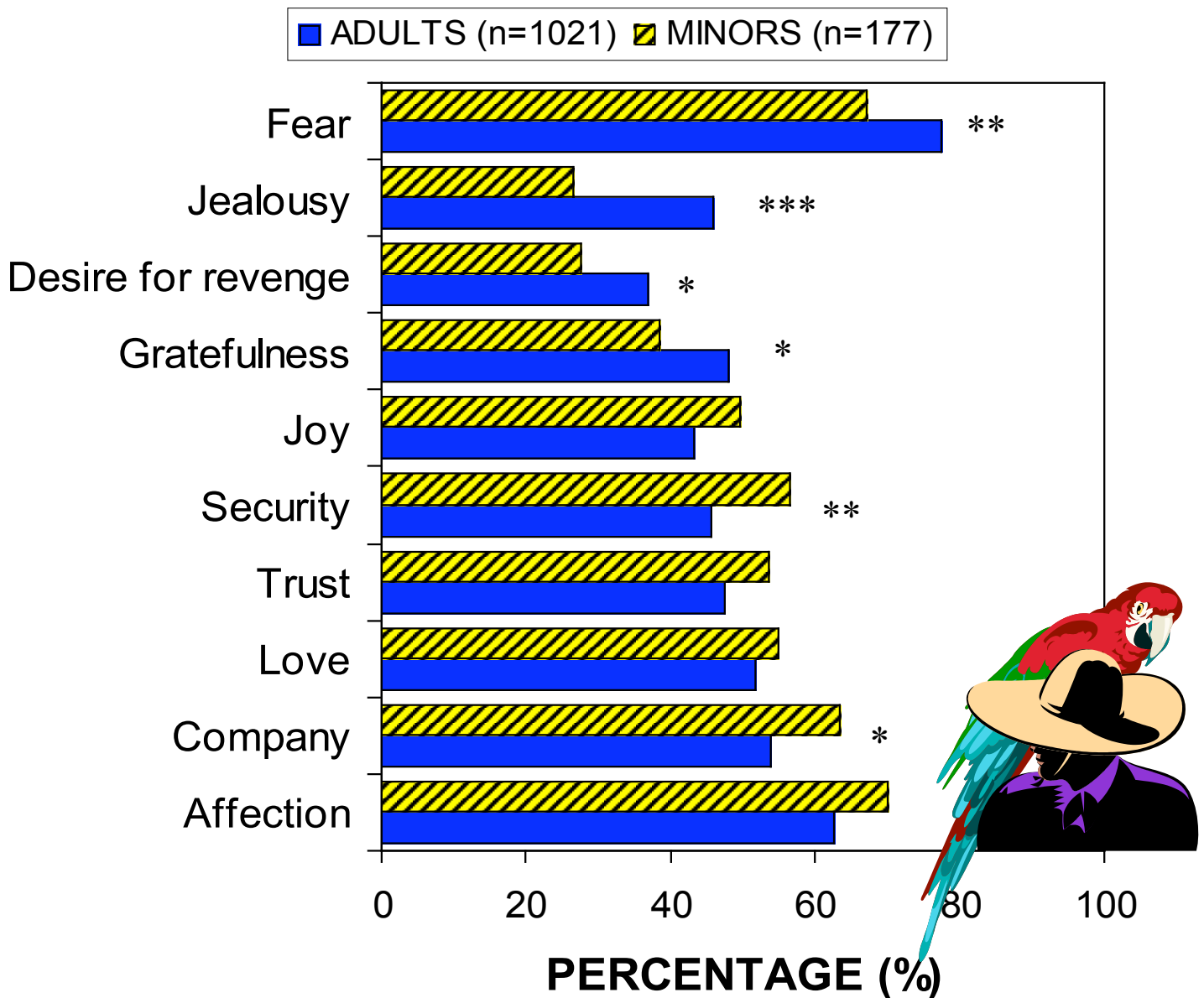


Fig. 32. Perception of adults and minors about feelings that macaws may have toward humans. The figure shows frequencies of choice by respondents from a given list. Minors attribute less negative feelings (fear, jealousy, desire for revenge) and more positive feelings (except gratefulness) to macaws than adults. Significant differences are indicated by *. Fear was the most commonly attributed feeling toward humans (67.2% of minors, 77.4% of adults). Overall, about half of the respondents consider that macaws may have positive feelings toward humans. Such attribution of feelings may explain why people consider that a singly caged animal is not lonely and stressed - but rather in good company of humans.

Attribution of feelings to macaws by whether or not respondent keeps or has kept psittacids

Feelings between macaws

There were no significant differences in the attribution of feelings to macaws living in the wild between people who currently keep or previously kept psittacids (n=511) and those who have never kept parrots at home (n=150).

Feelings by macaws toward humans

The proportion of people who attribute *love* to macaws as a feeling that these animals may have toward humans was significantly higher (*) among respondents who currently keep or previously kept psittacids (80.0%) than among those who have never kept parrots at home (71.4%). There were no significant differences with respect to the other feelings analyzed.

(*) *Statistics*: Chi-square=4.82, df=1, p<0.05

Fig. 33. Attribution of feelings to macaws by whether or not respondent keeps or has kept psittacids. With the exception of *love*, there were no significant differences between both groups.

Proportion of respondents who attribute to macaws various feelings that these birds may have toward other macaws and humans

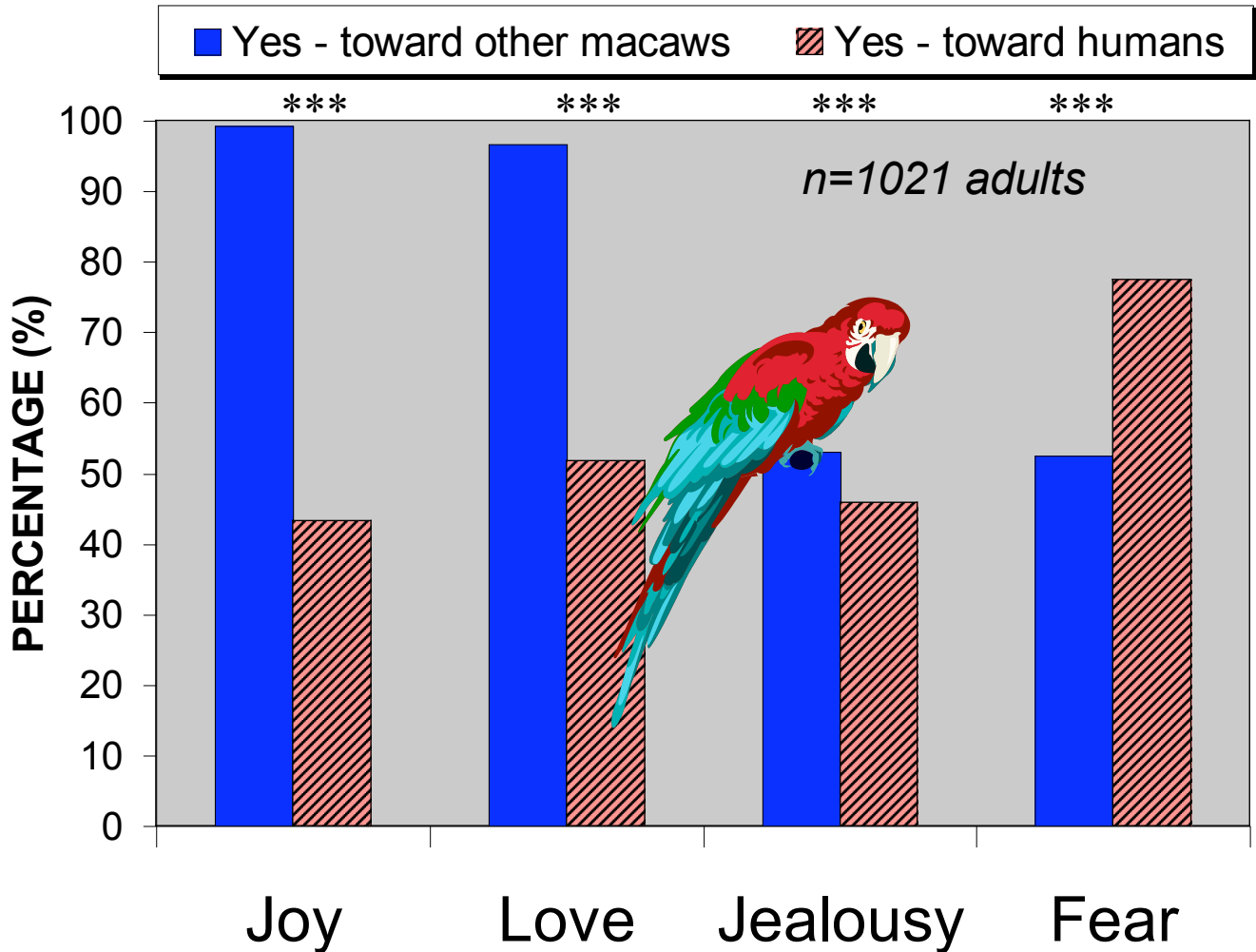


Fig. 34. Proportion of respondents who attribute to macaws various feelings toward other macaws and toward humans. Most respondents attribute positive feelings to the birds in macaw-macaw relationships but only about half so in macaw-human relationships. According to respondents, fear is more likely to be expressed by macaws in macaw-human interactions than in macaw-macaw interactions.

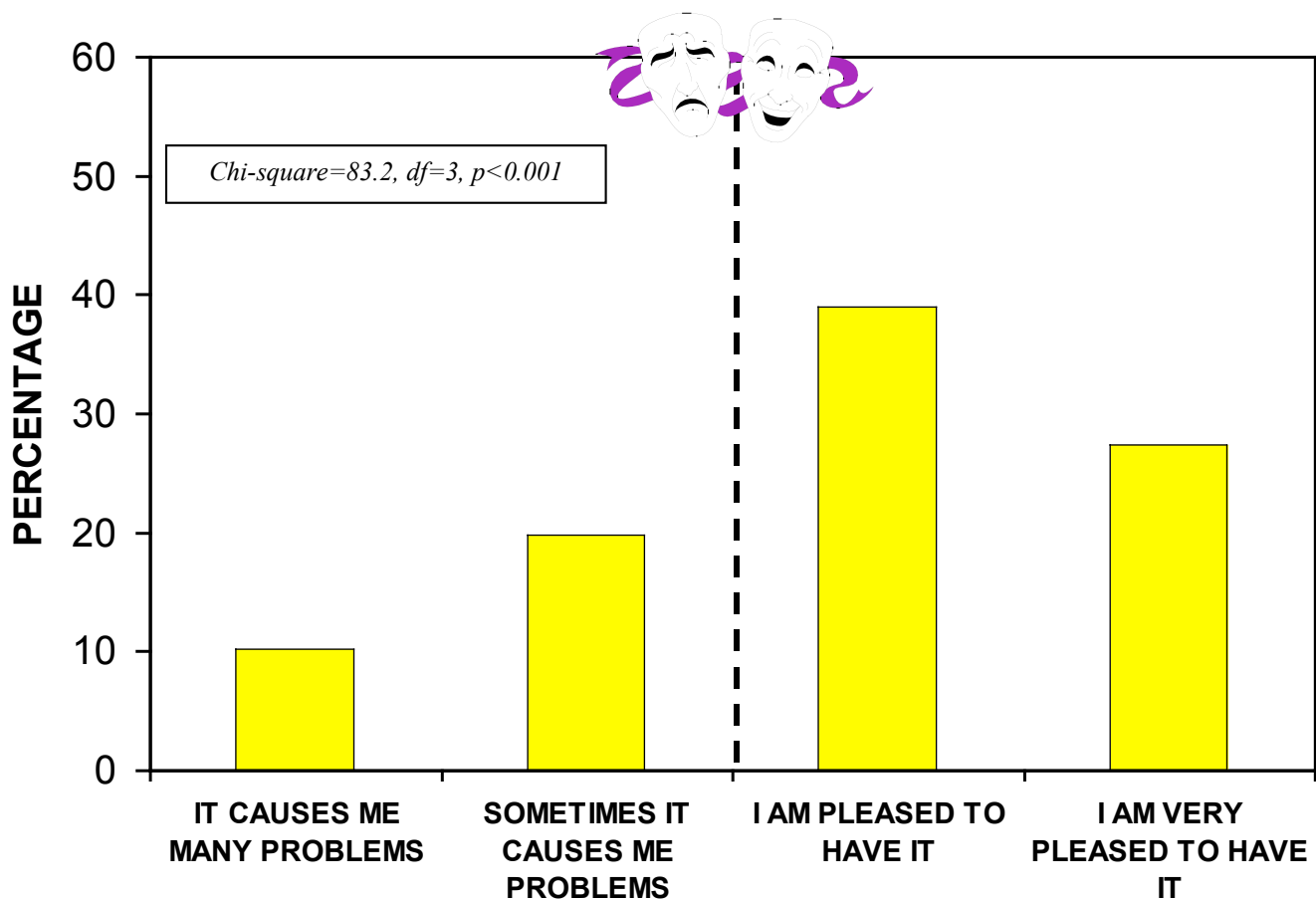
Statistics: Differences in all four feelings are statistically significant at the $p < 0.001$ level after Chi-square tests.

7. Perception about the experience of keeping wildlife at home

Perception of people who currently keep or have kept wildlife at home about their experience with the animal/s

1. *Problematic vs. Pleasing*

“In your experience of having wild animals at home, do you consider that ...”



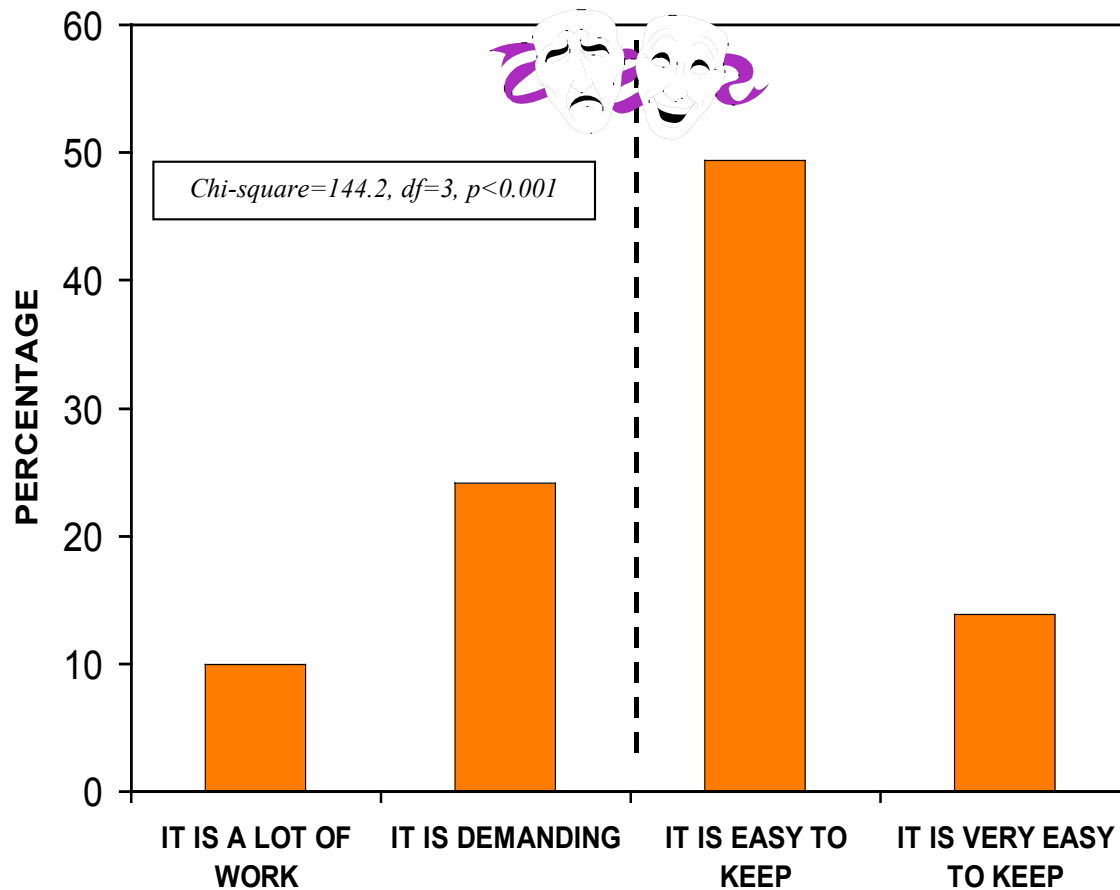
n=447 adults who currently have or have had wildlife at home

Fig. 35. Perception of people who currently keep or have kept wildlife: *Problematic vs. Pleasing*. The majority (66.8%) is pleased or very pleased with the experience of keeping a wild animal at home. There was no significant difference between sexes with respect to this item.

Perception of people who currently keep or have kept wildlife at home about their experience with the animal/s

2. *Demanding vs. Easy*

“In your experience of having wild animals at home, do you consider that ...”



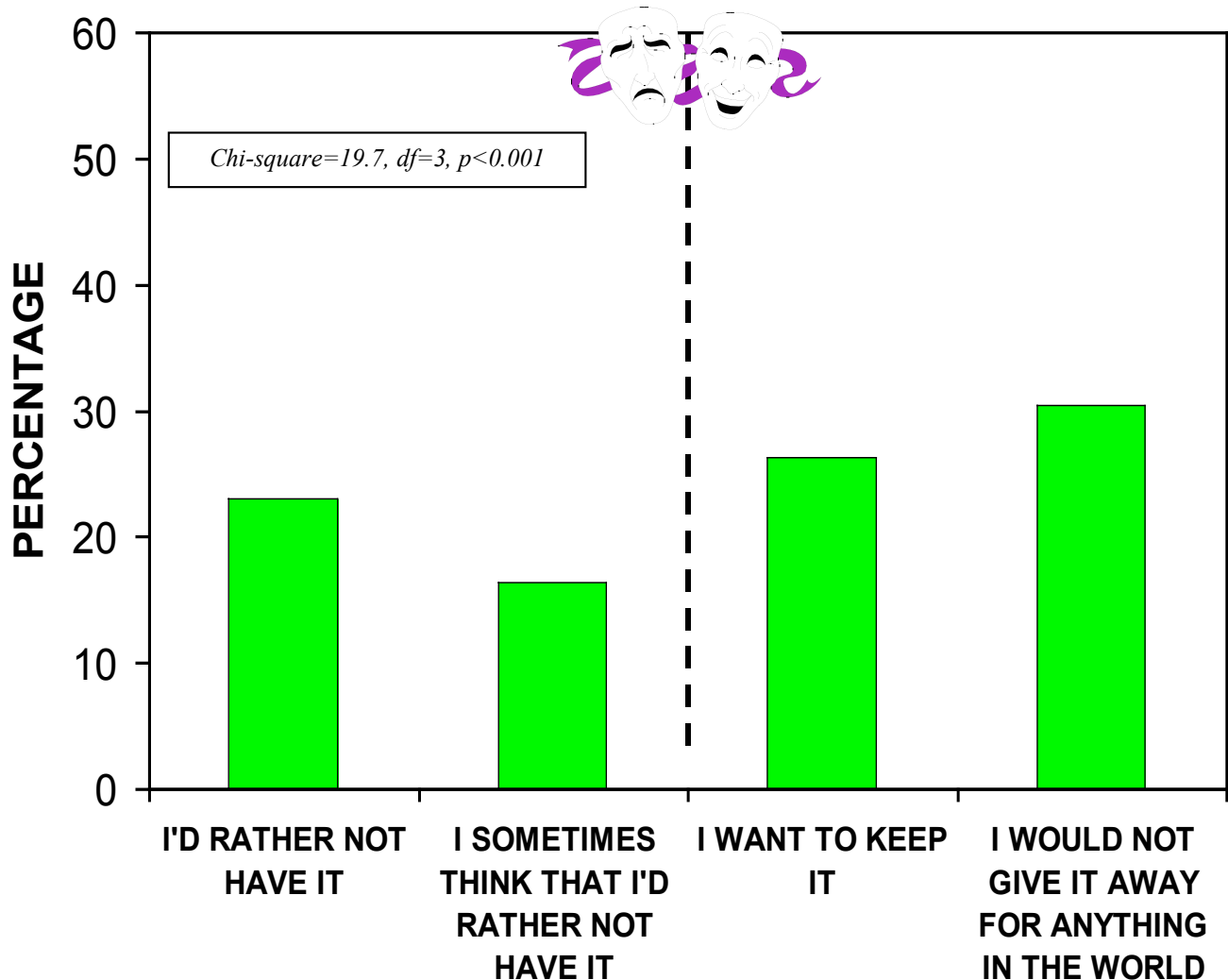
n=447 adults who currently have or have had wildlife at home

Fig. 36. Perception of people who currently keep or have kept wildlife: *Demanding vs. Easy*. The majority (57.9%) considers easy or very easy keeping a wild animal at home. There was no significant difference between sexes with respect to this item.

Perception of people who currently keep or have kept wildlife at home about their experience with the animal/s

3. *Regret vs. Desire to keep it*

“In your experience of having wild animals at home, do you consider that ...”



n=447 adults who currently have or have had wildlife at home

Fig. 37. Perception of people who currently keep or have kept wildlife: *Regret vs. Desire to keep it*. Although the majority would not want to give away the animal, 39.3% have reservations about their experience of keeping a wild animal at home. There was no significant difference between sexes with respect to this item.

8. Knowledge of the law and legal status of the animals

“Are you aware of any law that regulates the keeping of wildlife at home?”

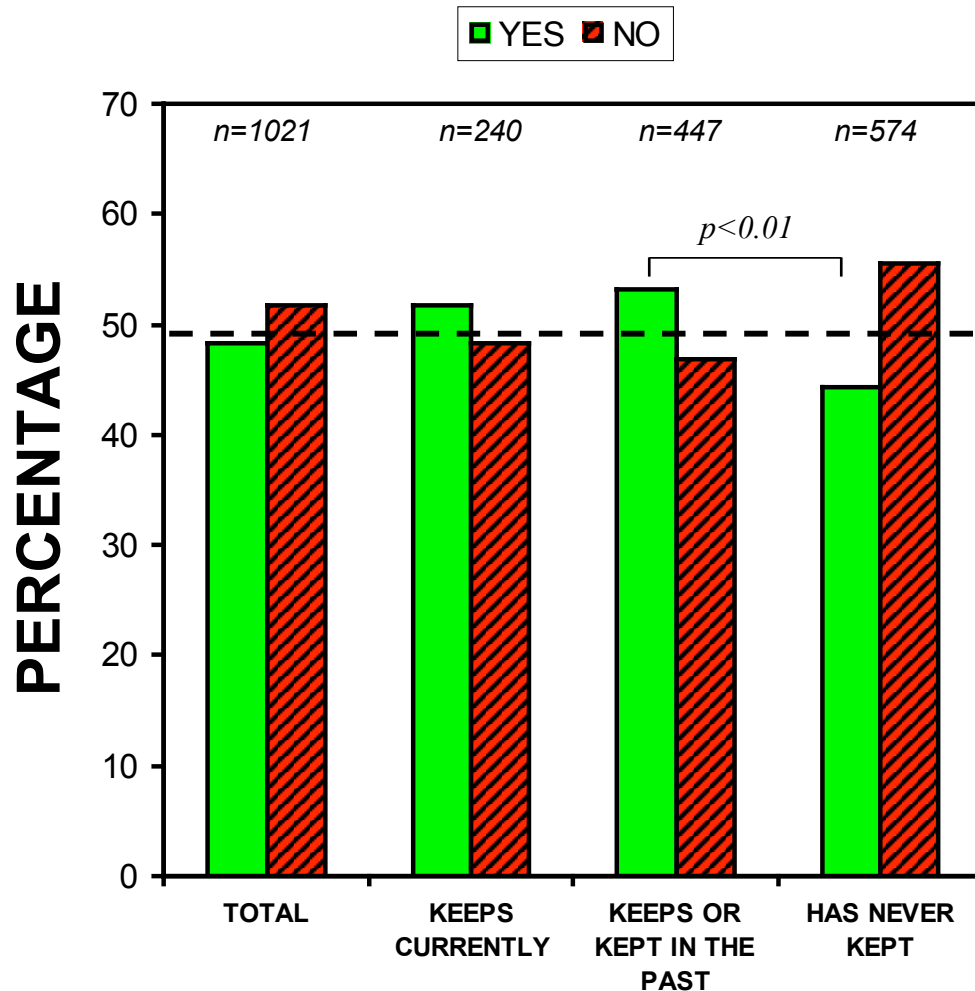


Fig. 38. Awareness about laws that regulate the keeping of wildlife at home. Nearly half of the adult respondents are not aware of such legislation. The proportion of adults who claim to be aware of a pertinent law is slightly higher among those who currently keep or have kept wildlife in the past than among persons who have never kept wild animals at home ($Chi-square=7.8, df=1, p<0.01$).

“What do you think that is stated by such a law?” ... that regulates the keeping of wildlife at home

■ KEEPS OR KEPT WILDLIFE n=447 ■ NEVER KEPT WILDLIFE n=574

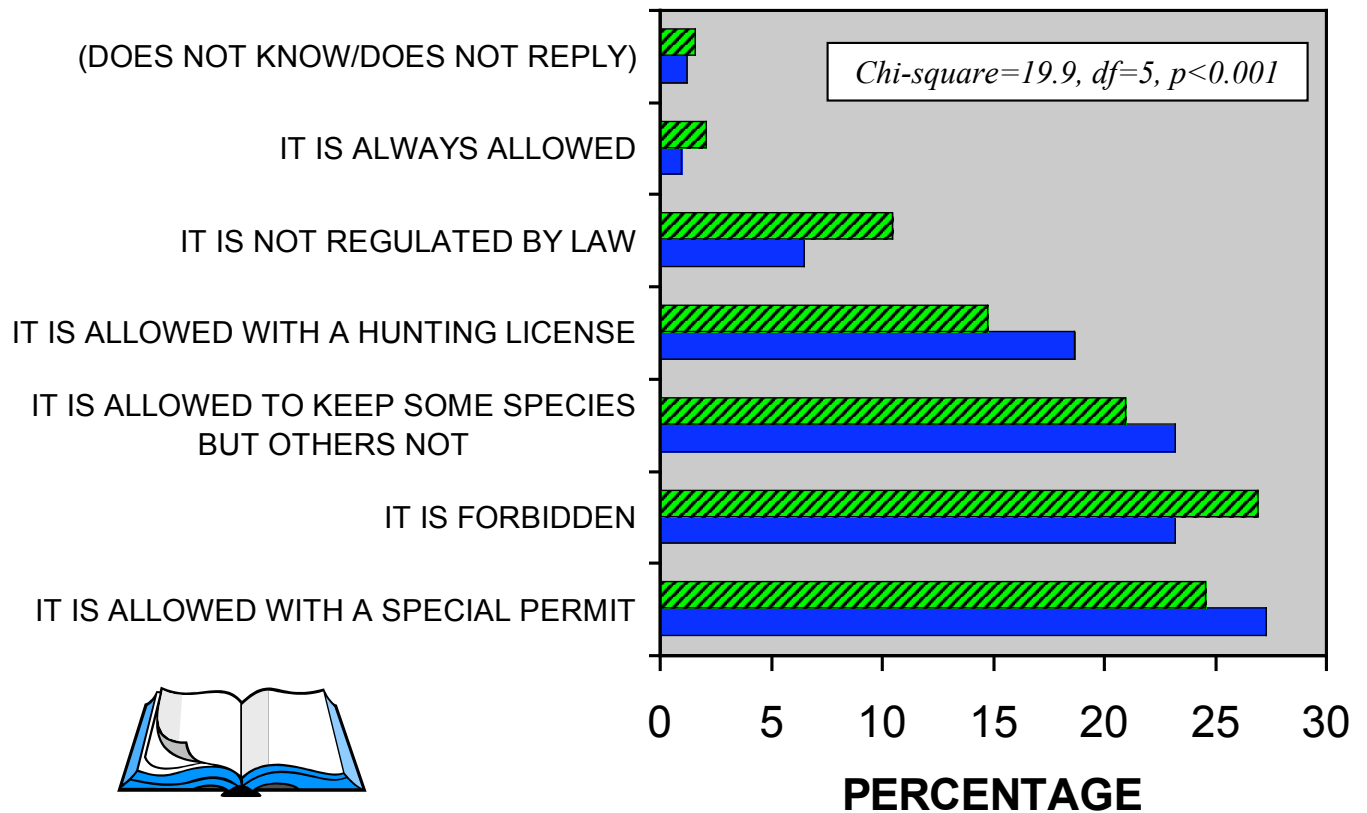


Fig. 39. Frequency of responses from a given list, with respect to the presumed contents of legislation that regulates the keeping of wildlife at home. The first three answers from top to bottom are incorrect, whereas the last four answers are in accord with the law. People who keep or kept wildlife differ significantly in their perception about the contents of the law from people who have never kept wild animals at home.

“Did someone from your home ever apply for such a permit?” ... to keep wildlife at home

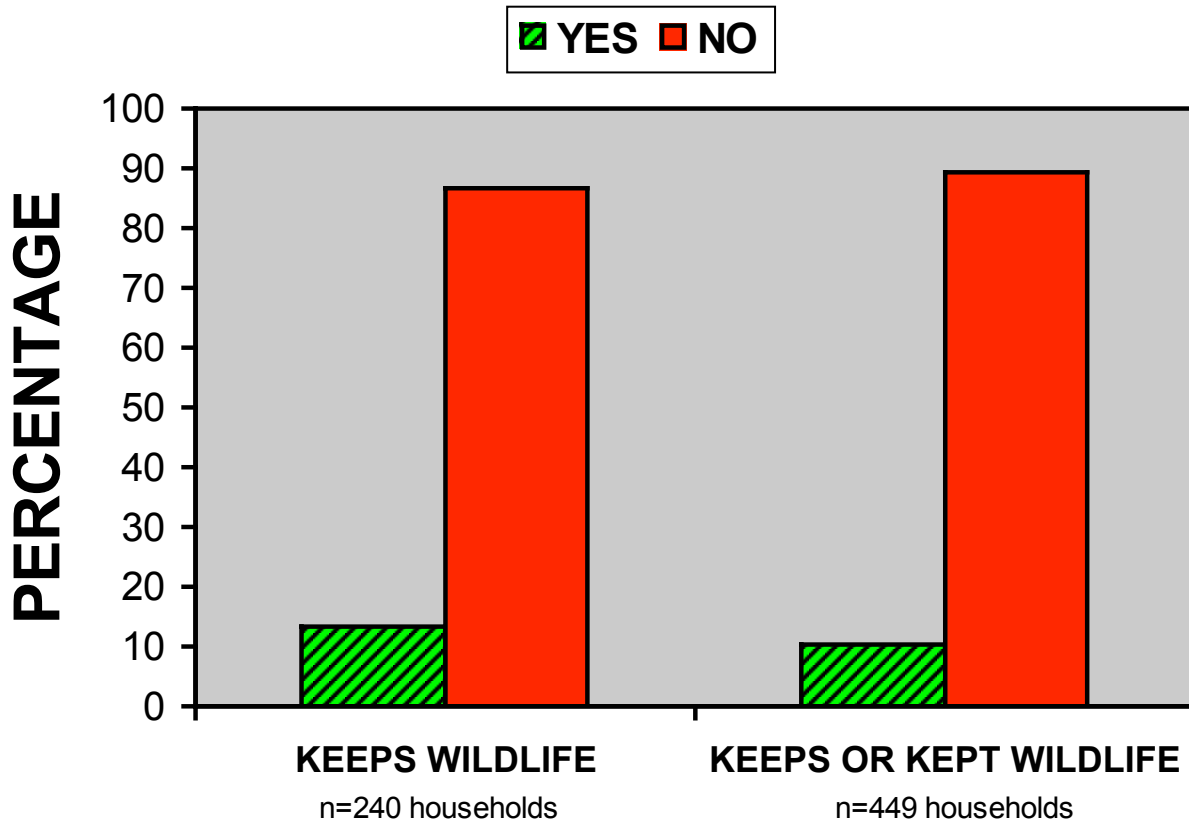


Fig. 40. Frequency of responses YES or NO to the question of whether anyone from home ever applied for a permit to keep wildlife, among households which either keep wildlife currently or which did so in the past. At least 86.7% of animals currently in Costa Rican households are kept illegally. This is a conservative estimate since it is likely that some affirmative responses are in fact false.

9. Assignment of care duties among family members

“To whom does the animal belong to?” ... in households which currently keep wildlife

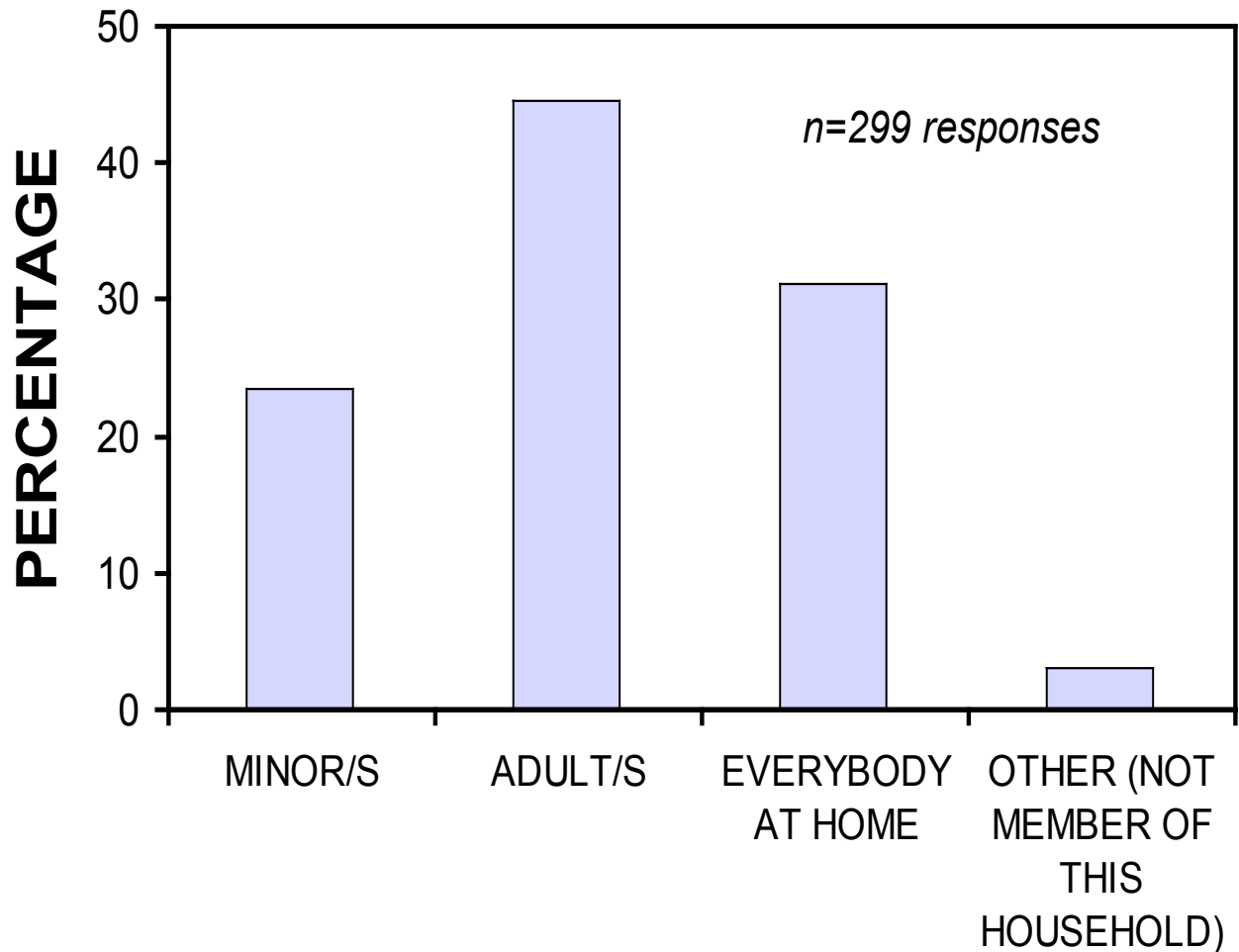
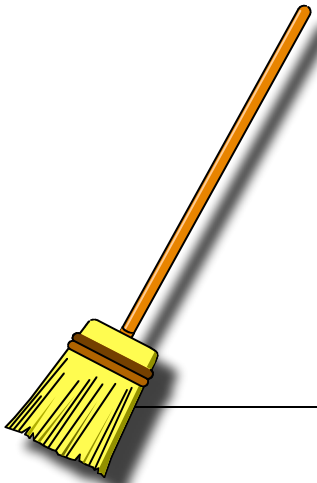


Fig. 41. Ownership of the wild animal kept at home. The majority is owned exclusively by adults. Shared ownership by all members of the household was the second most common response, followed by exclusive ownership by a minor.

Person who most frequently cleans the enclosure of the favorite animal



♂ vs. ♀

SEX OF PERSON WHO CLEANS

	MALE	FEMALE	n
RESPONDENT	40.2%	59.8%	97
SPOUSE	42.3%	57.7%	26
PARENT	27.0%	73.0%	37
TOTAL	37.5%	62.5%*	160
% in overall adult sample	48.8%	51.2%	1021

Fig. 42. Person who cleans the enclosure. The enclosure is most frequently cleaned by the adult respondent or his/her spouse in 59.1%, a minor in 10.6%, a parent of the adult respondent ("*grandma* or *grandpa*") in 17.8%, and by somebody else in 12.5% of 208 cases. In nearly two thirds of the cases the cleaner was a woman, but this bias toward females was not statistically significant.

* The deviation toward females from the sex proportions of the overall sample was not statistically significant when respondents and their spouses were used as the basis for comparison: *Chi-square*=2.9, *df*=1, *p*=0.09. Parents of respondents were excluded in this comparison, since their sex ratio in the overall sample is unknown.

Person who most frequently feeds the favorite animal



♂ vs. ♀

SEX OF PERSON WHO FEEDS

	MALE	FEMALE	n
RESPONDENT	37.9%	62.1%	103
SPOUSE	36.4%	63.6%	33
PARENT	20.0%	80.0%	45
TOTAL	33.1%	66.9% *	181
% in overall adult sample	48.8%	51.2%	1021

Fig. 43. Person who feeds the wild animal. The favorite animal is most frequently fed by the adult respondent or his/her spouse in 56.7%, a minor in 11.7%, a parent of the adult respondent ("*grandma* or *grandpa*") in 18.8%, and by somebody else in 12.9% of 240 cases. In two thirds of the cases the person who regularly fed the pet was a woman, a statistically significant sex bias in this role.

* The deviation toward females from the sex proportions of the overall sample was statistically significant when respondents and their spouses were used as the basis for comparison: *Chi-square*=6.1, *df*=1, *p*<0.05. Parents of respondents were excluded in this comparison, since their sex ratio in the overall sample is unknown.

10. Acquisition process

”How did you obtain your animal?”
 ... in households which currently keep wildlife

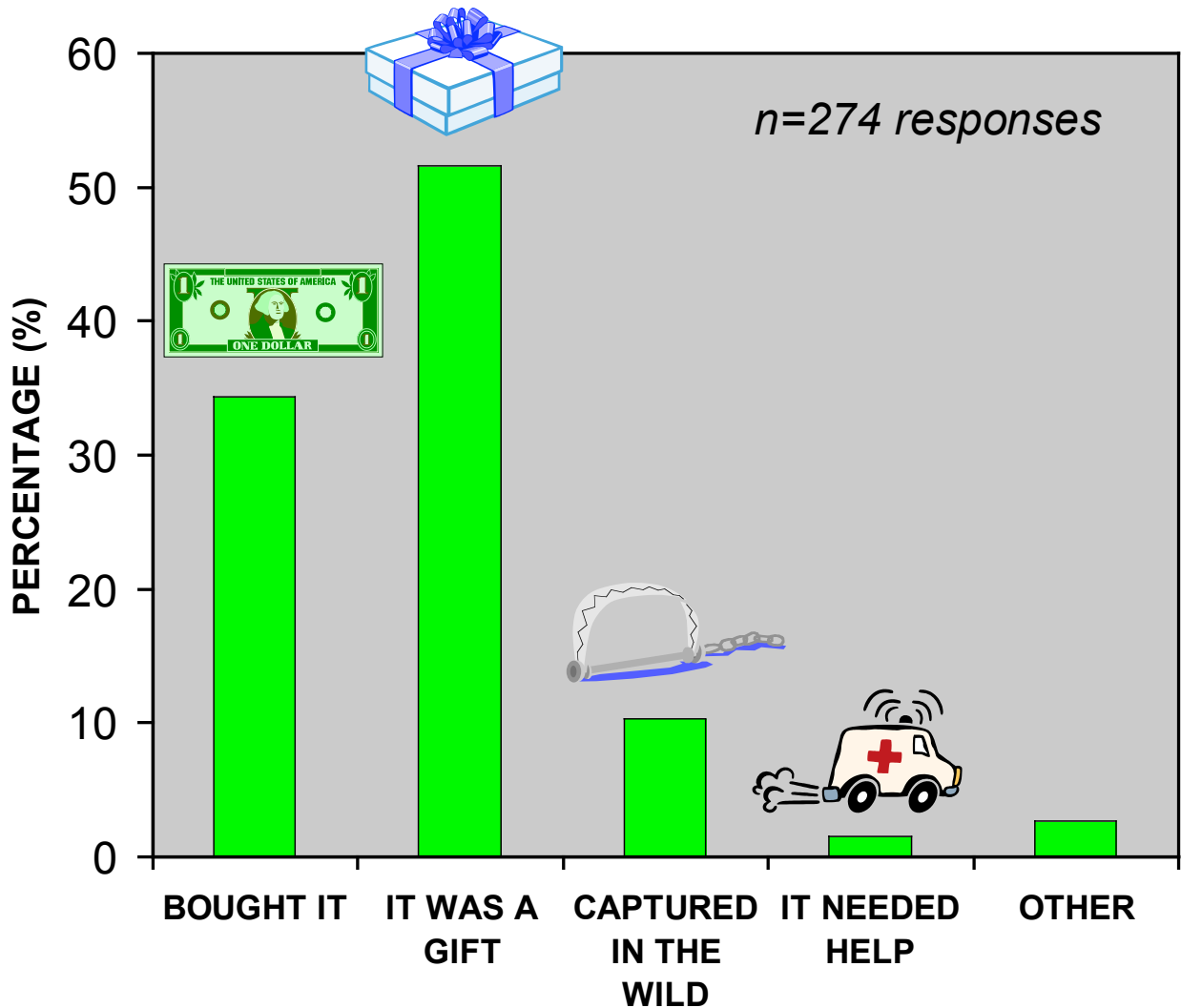


Fig. 44. Frequency of answers selected by respondents from a list, upon asking how the animal was obtained. The majority report that the animal was obtained as a gift or purchased. Commercial trade of wildlife is illegal in Costa Rica. 58.5% of the 94 reported purchases of wild animals were spontaneous, rather than planned. The majority (82% of 39) of purchases of psittacids were spontaneous, whereas nearly two thirds of purchases of turtles and of fishes were planned (61.1% of 18, and 63.2% of 19 purchases, respectively).

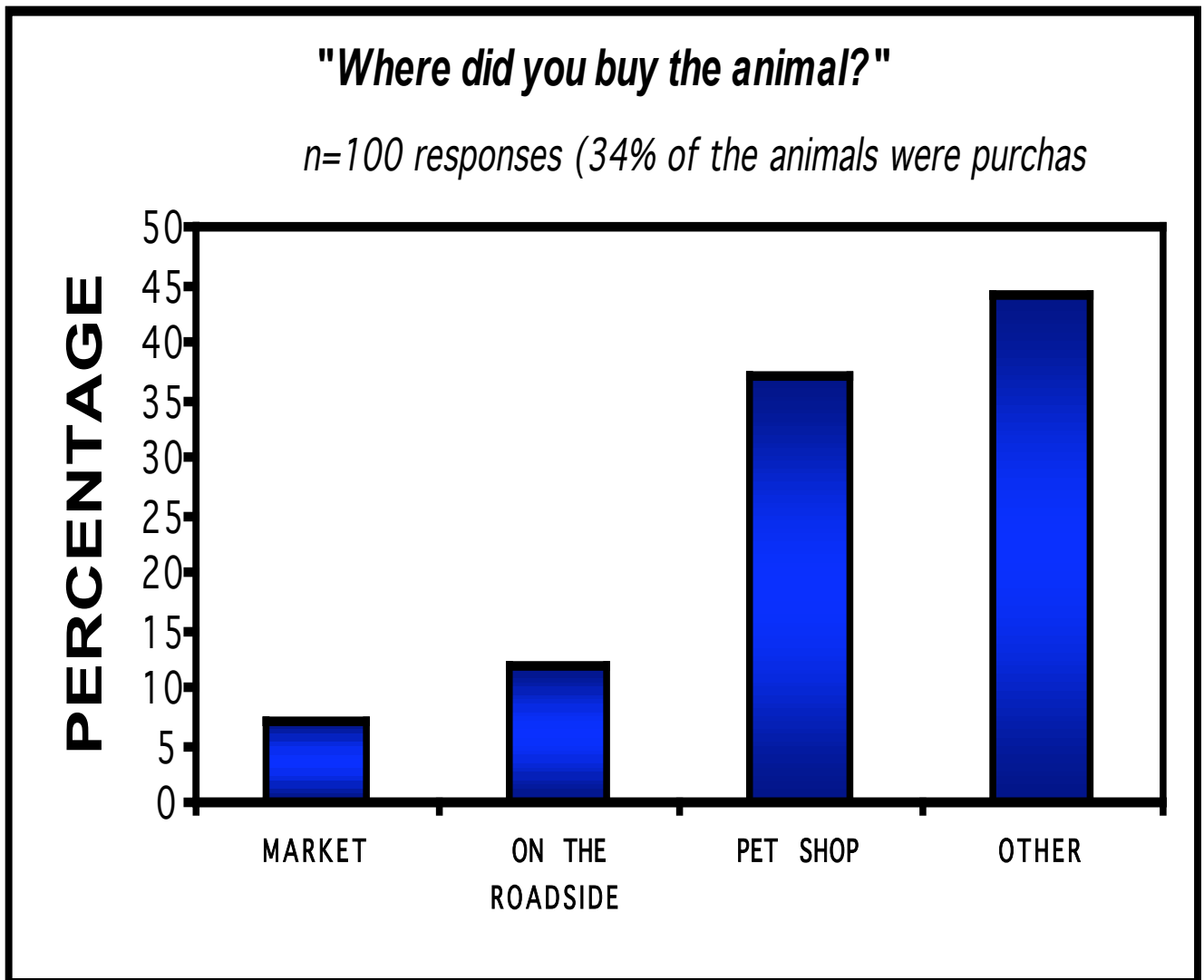
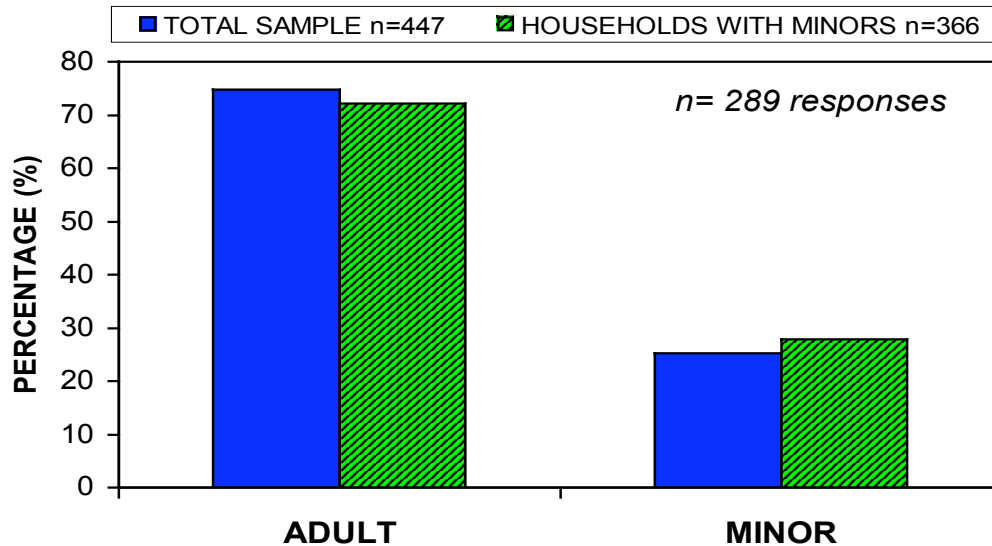


Fig. 45. Place of purchase of the animal. Frequency of answers selected by respondents from the list of predefined options. The data confirms that wildlife is still being sold illegally in local markets and on the roadsides. The answer "other" probably corresponds to purchases from individuals in the neighborhood. The high proportion of reported purchases in pet shops (37%) is unlikely to be true, given that only fishes and iguanas can be sold legally by these establishments. Fishes and iguanas make up less than 10% of the positive responses to wildlife species kept in Costa Rican households (n=299 responses).

ADULTS VS. MINORS

1. *"Whose idea was it, to obtain the animal?"*



2. *"Who did actually obtain the animal?"*

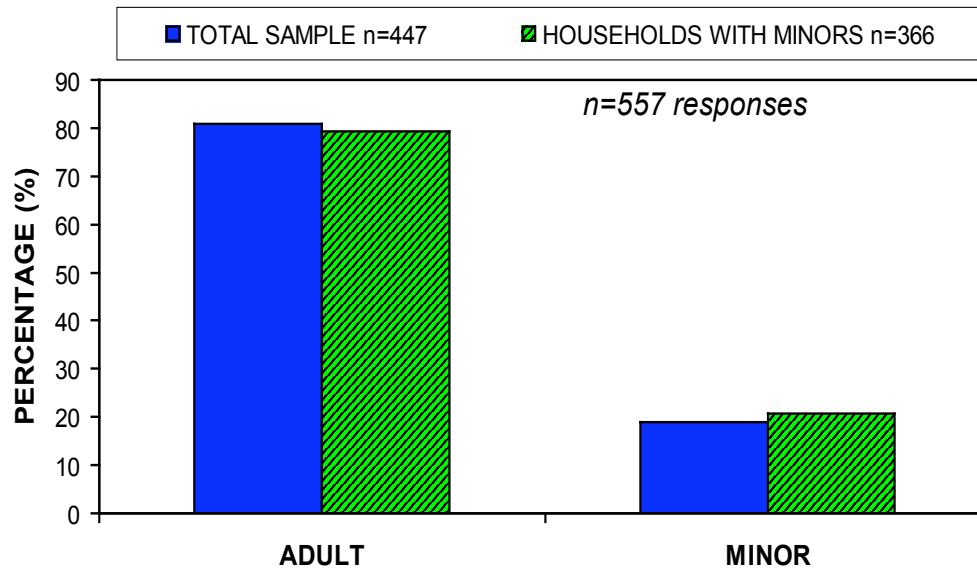
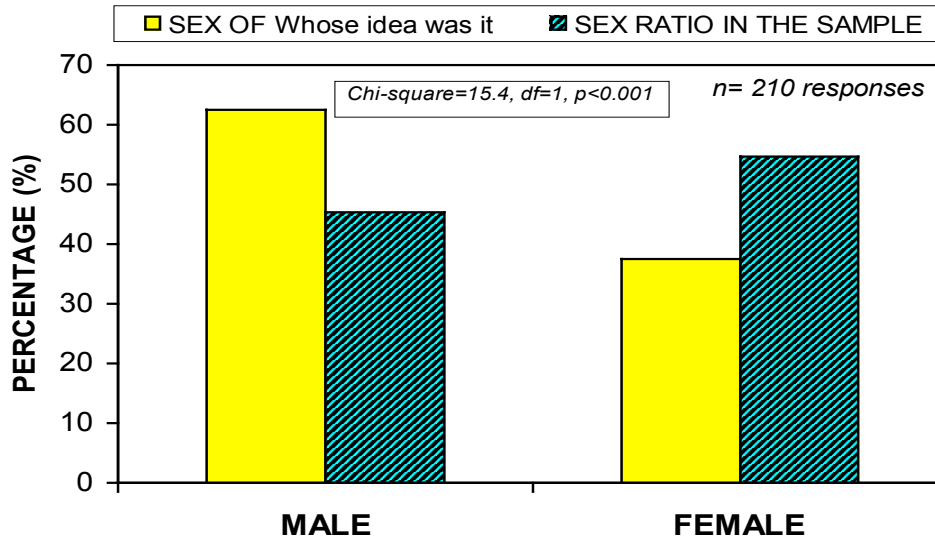


Fig. 46. Whose idea was it to obtain the animal and who did actually obtain it? In just over a quarter of cases the idea came from a minor. Minors made the acquisition in a fifth of cases. The initiative to obtain wildlife is taken and carried out by adults in the majority of cases.

1. "Whose idea was it, to obtain the animal?"



2. "Who did actually obtain the animal?"

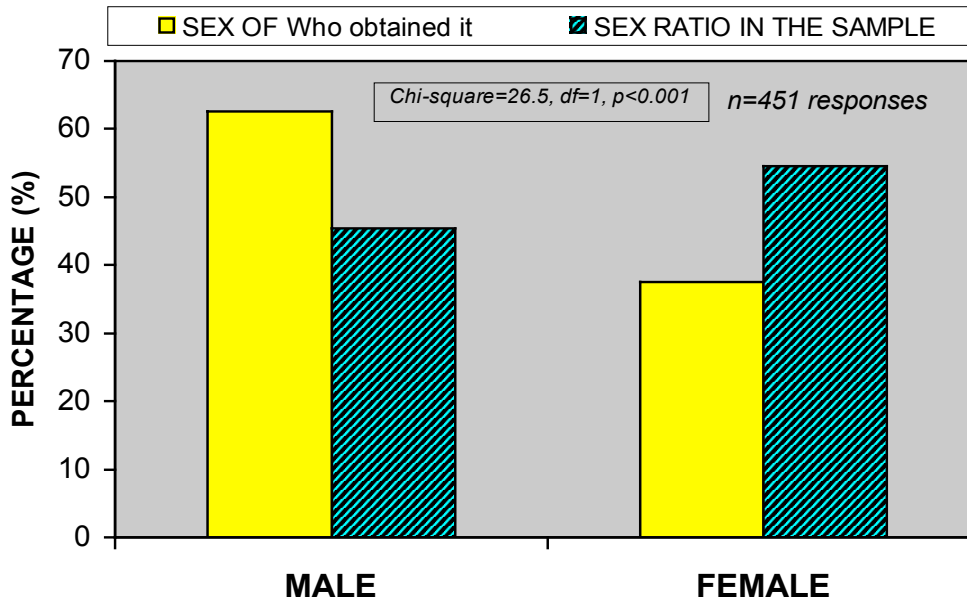


Fig. 47. The role of gender in "Whose idea was it to obtain the animal and who did actually obtain it"? The idea to obtain a wild animal was more likely to come from a male than from a female adult. Also, males were more likely to actually acquire the animal than females. These male-biases differed significantly from the overall sex ratio in the sample of adults who kept wildlife at some point (n=447).

"If the idea to obtain the animal was yours, what motivated you to obtain it?"

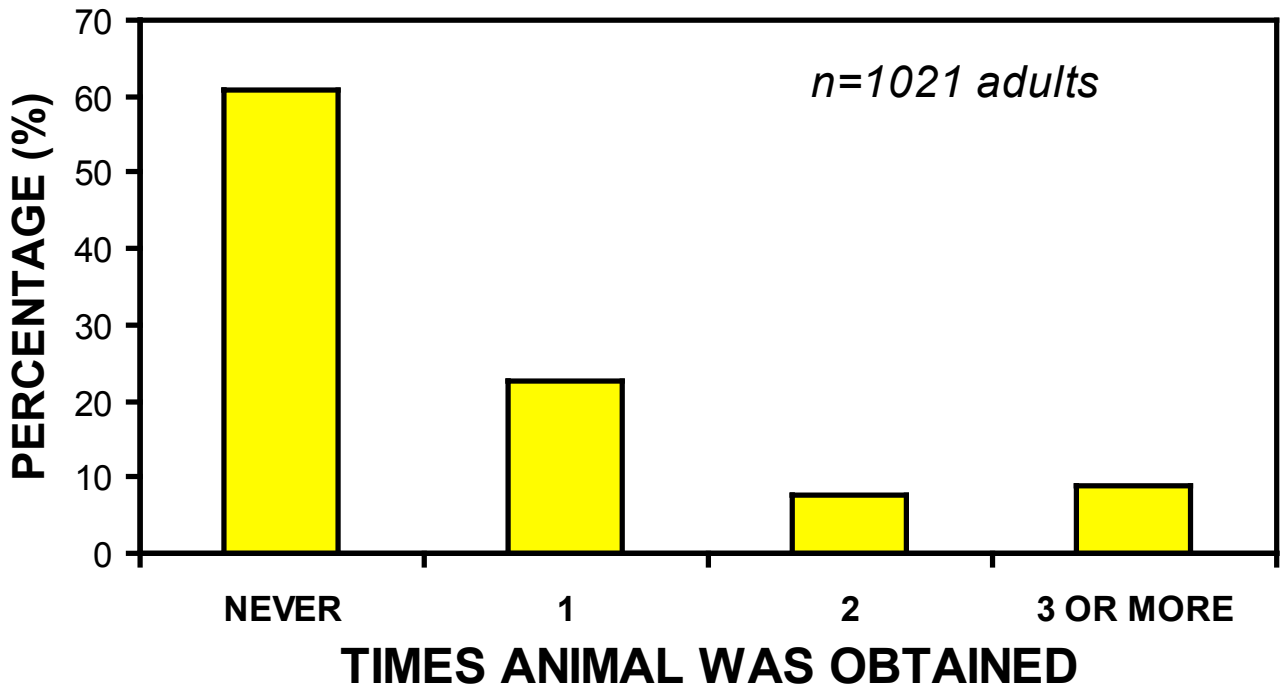
- choices of 147 adult respondents among a given set of options (multiple choices possible) -

Choice	% respondents
"I liked the animal"	69.4%
"I felt sorry when I saw it."	11.6%
"Family tradition."	7.5%
"It is good for the children."	7.5%
"It is a Costa Rican custom."	1.4%
Other	7.5%
<i>Does not know/Does not answer</i>	6.1%

Fig. 48. Motivation behind obtaining a wild animal. The majority of respondents selected "*I liked the animal*" among the choices given.

11. Demand for wild animals and their fate

"How often in your lifetime have you obtained wild animals to keep them at home?"



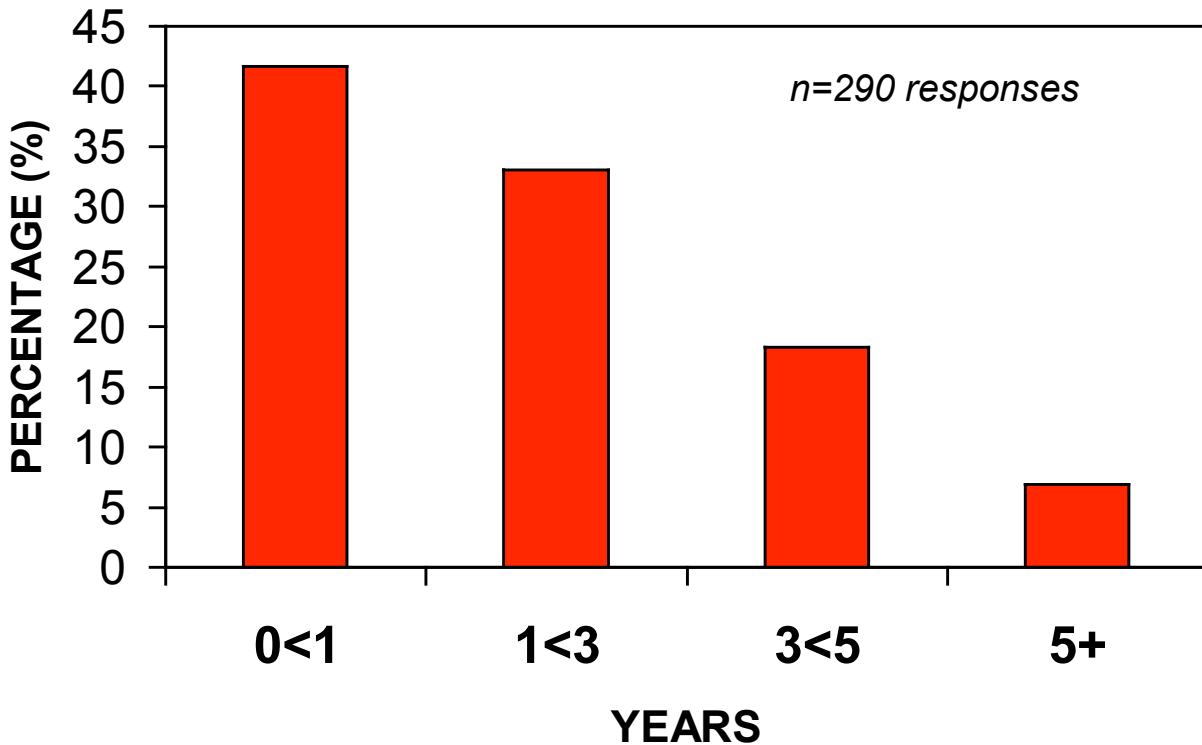
"Did you obtain a wild animal last year?"

YES = 19.5%

Fig. 49. Proportion of adults who have ever obtained a wild animal to keep it at home. 39% of the adults have obtained a wild animal at least once in their lifetime. About one fifth of the respondents who keep or kept wildlife obtained an animal in the previous year.

"How long have you had your animal for?"

Sample: adults who currently keep a wild animal



"If it died, would you replace it?"

Yes - 50% No - 50%

Fig. 50. Time that the wild animal has been kept for at home. The majority (74.8%) has been in the household for less than three years. The average residence time of the animal at home is very short, considering that most wildlife pets are parrots, which can live for several decades. For all species combined, half of the respondents asserted that they would replace their pet if it died. However, people are more willing to replace fishes (74.1%), song- and ornamental birds (65.7%) and turtles in aquaria (57.9%), than parakeets (47.9%), parrots (33.9%) and tortoises (6.7%). There was no significant difference between male and female adults in the willingness to replace the pet.

"How long have you had your animal for? - common species

Sample: adults who currently keep a wild animal

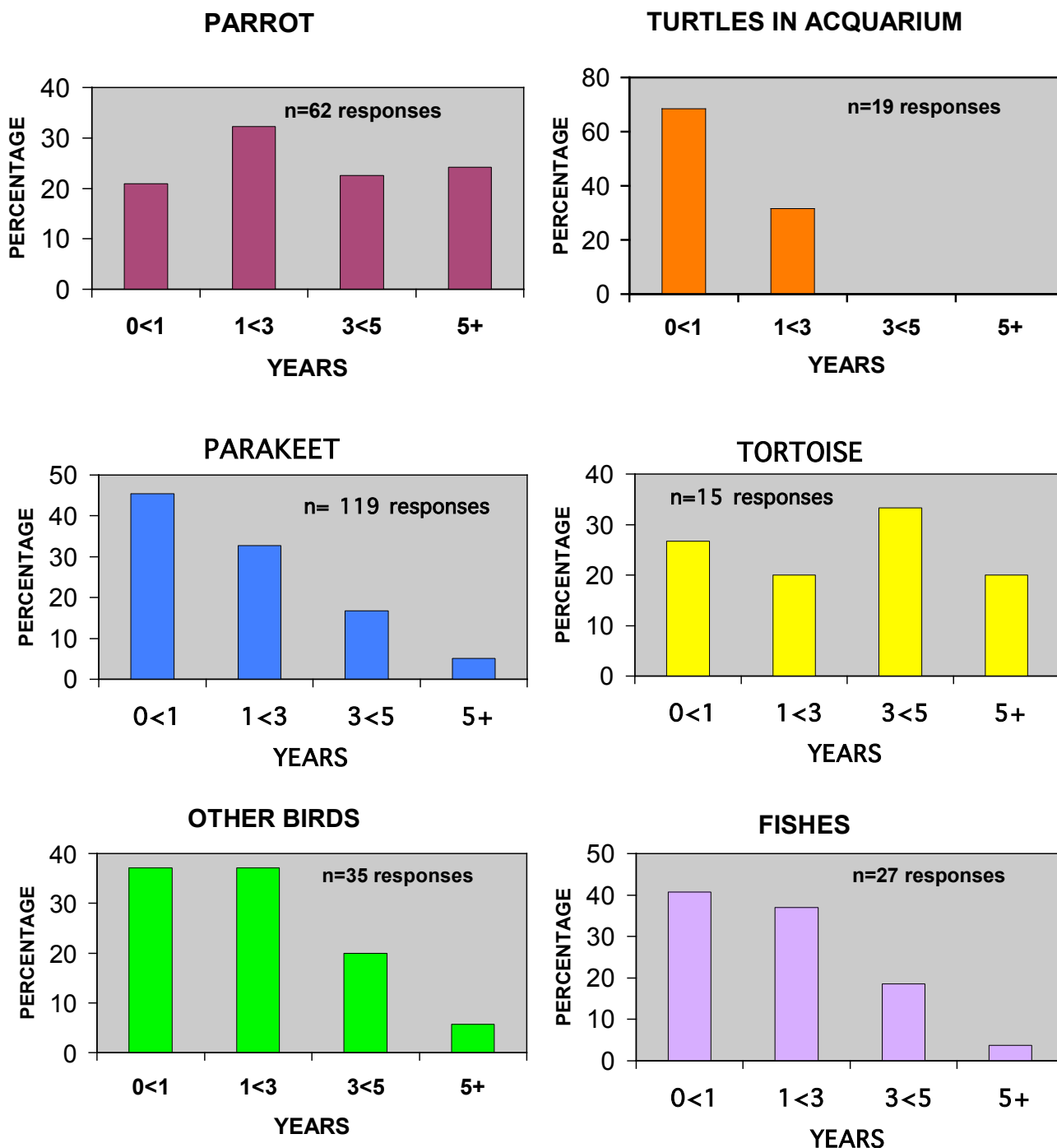
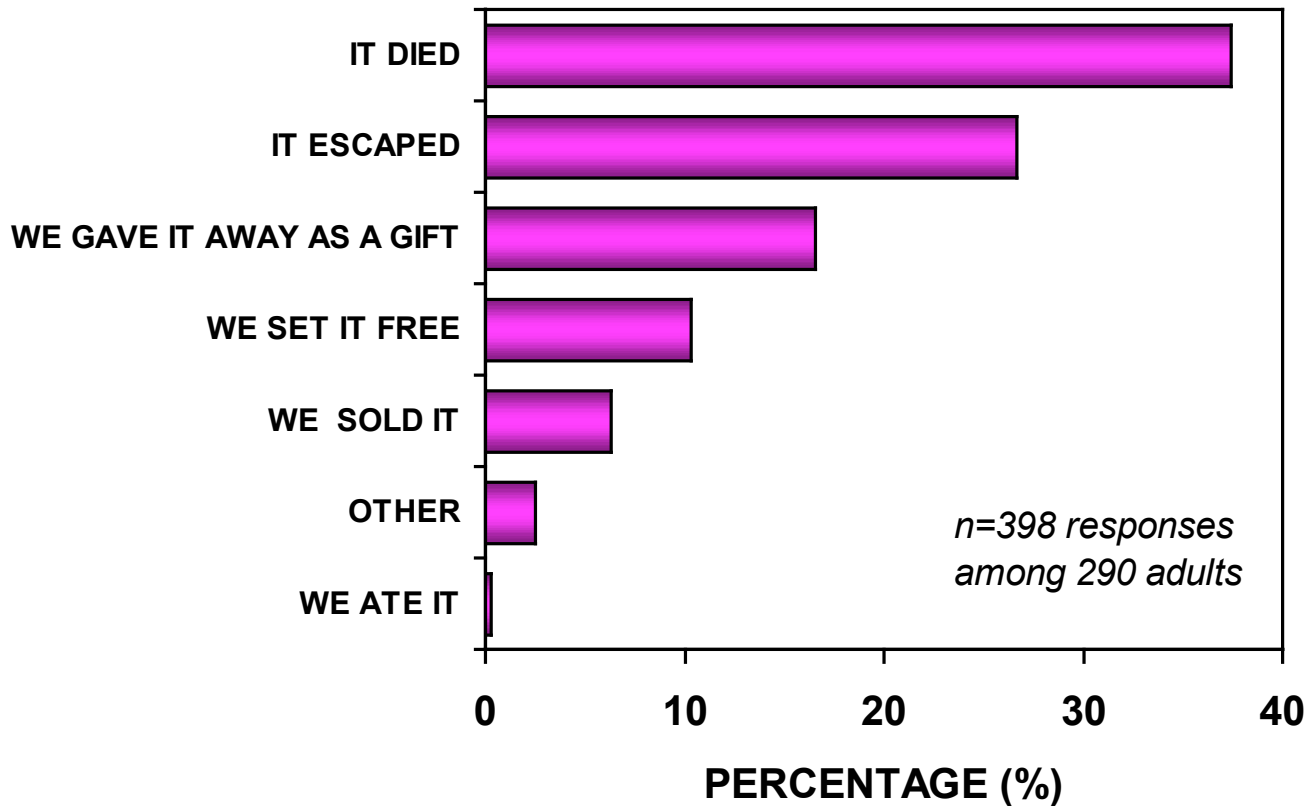


Fig. 51. Time kept at home since acquisition for various, commonly kept species. The data are indicative of the longevity of these wild animals in captivity. Parrots and tortoises tend to be long-lived, whereas turtles in aquaria (e.g. *Trachemys scripta*) and parakeets are usually short-lived in captivity. Other birds (songbirds and ornamental birds) and fishes occupy a middle position among these species.

*"What happened to the animal/s
that you had?"*



***"Did you replace the
animal?"***

Yes = 45.3%

No = 54.7%

Fig. 52. Fate of wild animals kept at home. About one in four animals escape (26.6%). In at least 6.3% of the cases the animal was sold (illegally). In nearly half of the cases the animal was replaced, which is in accord with the fact, that half of the respondents who currently keep wildlife intend to replace the pet if it dies (in a previous figure).

"Are you willing to obtain another/a pet wild animal?"

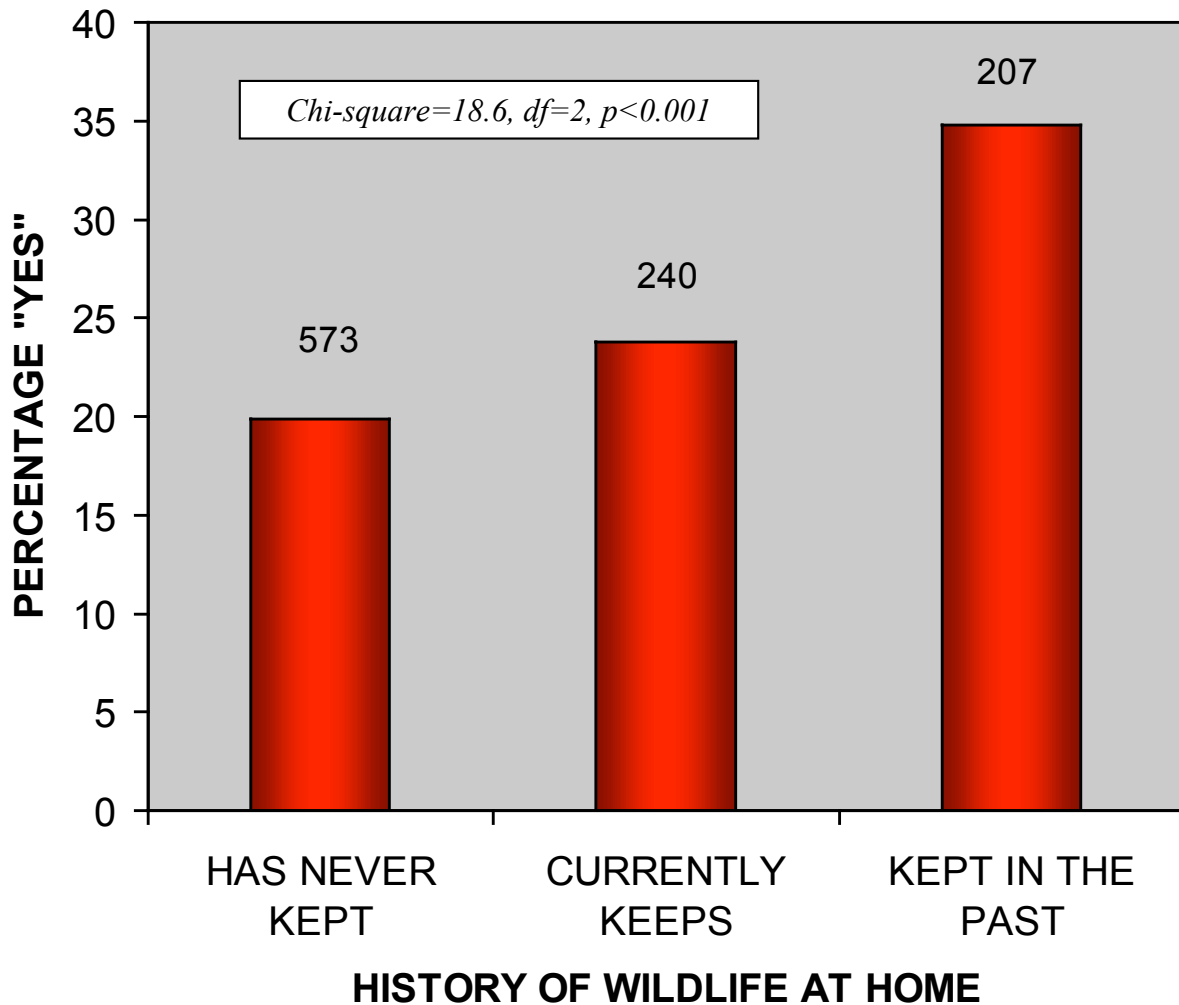
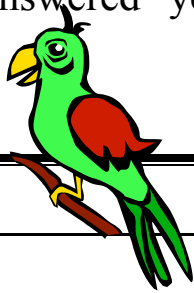


Fig. 53. Demand for pet wildlife as expressed by adults who have never kept a wild animal at home and those who did so in the past or currently keep wildlife (sample sizes shown on bars). Overall, 23.8% of adults expressed willingness to obtain a wild animal. One fifth of those who never kept wildlife at home would like to obtain a wild animal. Nearly a quarter of those who currently keep wildlife would like to add another animal to their pets. The highest proportion of adults intending to obtain a wild animal is found among those who kept wildlife in the past but don't so currently (34.8%).

"What species would you like to obtain?"

Sample: respondents who never had wildlife at home and answered "yes" to the question of whether they are willing to obtain a wild animal ($n=114$ adults)



	Species	Frequency	(%)
1	Green parakeet	26	22.8
2	Macaw	22	19.3
3	Parrot	22	19.3
4	Toucan	13	11.4
5	Monkey	6	5.3
6	Agouti	4	3.5
7	Racoon	4	3.5
8	Turtle	4	3.5
9	Deer	3	2.6
10	Fish (not goldfish)	3	2.6
11	Wild cat	3	2.6
12	Snake	1	0.9
13	Iguana/Ctenosaur	1	0.9
14	Coati	1	0.9
15	Quetzal	1	0.9
	TOTAL	114	100

Fig. 54. Preference for various species among respondents who never had wildlife at home and would like to obtain a wild pet. The majority (61.4%) would like to have a parrot.

Preference for birds

Birds are the most commonly mentioned taxon for the wild animal of choice (72.6% of 241 respondents). The vast majority of birds preferred are psittacids (parakeets, parrots and macaws), which account for 84.6% of all birds mentioned (n=175). The highly endangered macaws represent 28.4% of the 148 psittacids mentioned.

Preference for mammals

Mammals are second (17.4%), after birds, in the list of preferred wild animals as pets. The monkey ranks at the top of the mammals with 33.3% of the responses in this group. Other mammals commonly mentioned include agouti, raccoon wild cat and deer

Preference for primates

*Primates were the first choice of pet wildlife for 5.8% of the 243 respondents. The squirrel monkey (*Saimiri oerstedii*) corresponded to 73% of the 11 cases in which a specific species of primate was mentioned as the animal of choice. Other species mentioned were the howler (*Alouatta palliata*) and capuchin monkey (*Cebus capucinus*). There was no mention of the spider monkey (*Ateles geoffroyi*), the fourth Costa Rican monkey species. The squirrel monkey is probably the most endangered primate species in Costa Rica.*

Preference for reptiles, fishes and amphibians

Reptiles (6.6%, iguanas, turtles and snakes) rank third after birds and mammals in the list of species to potentially obtain. Fishes (3.3%) rank

Fig. 55. Preference for certain taxa by respondents who are willing to obtain a wild animal, when asked which species they would like to obtain as a pet.

(n=243 adults with and without prior experience with wildlife at home)

Incidence of taxonomic groups among respondents who currently keep wildlife compared with preference by respondents who are willing to obtain a wild animal as a pet

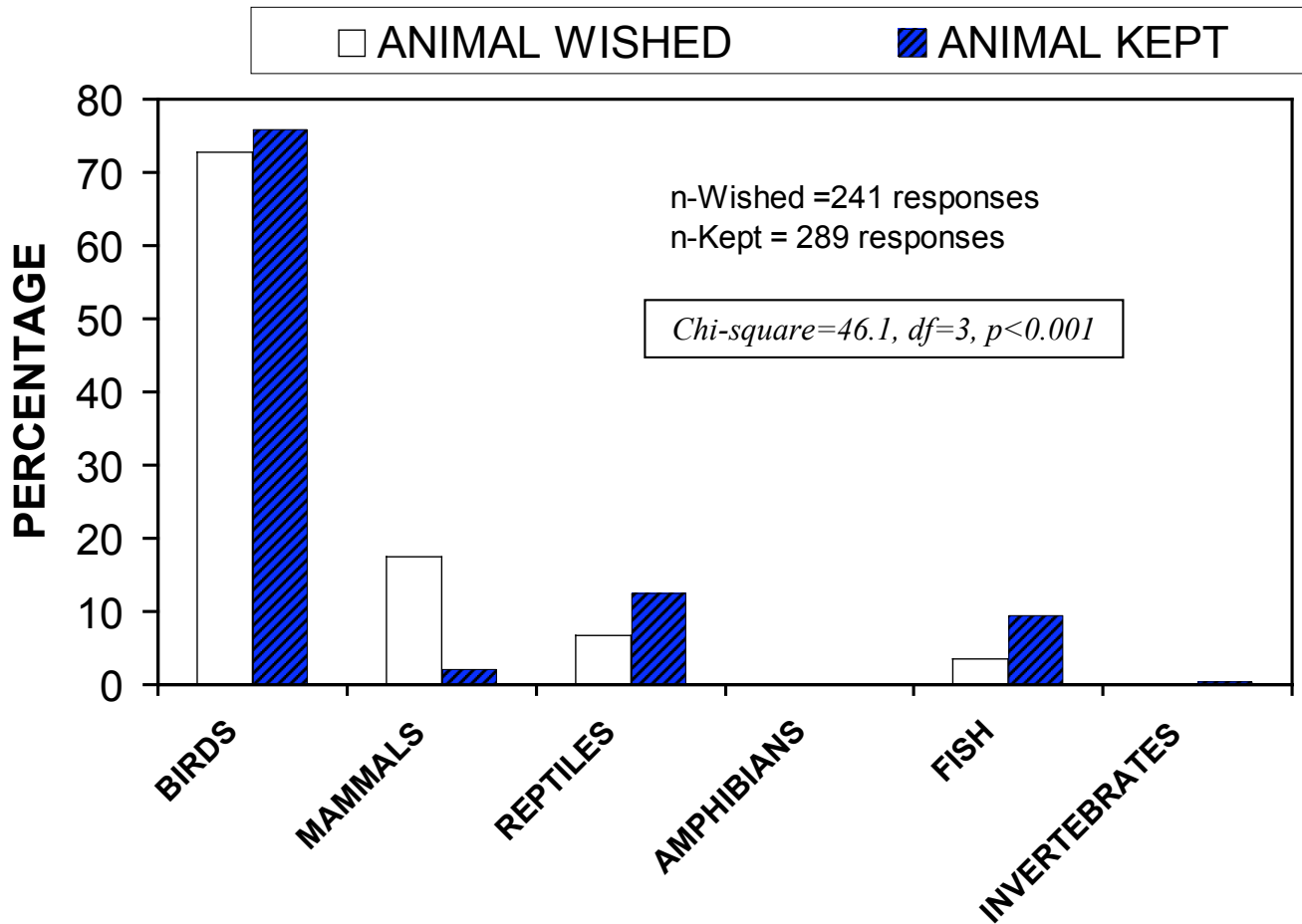


Fig. 56. Comparison of incidence of taxonomic groups kept in households and preference for an eventual acquisition. The proportions of birds, mammals, reptiles and fish differ significantly between both samples. Birds are the preferred pet wildlife - both, among animals currently kept and animals chosen for an eventual acquisition. Although mammals are the preferred animal for an eventual acquisition of 17.4% of respondents, the proportion of mammals actually kept in households is much lower (2.1%). The opposite is true for reptiles and fish.

Statistics: The distribution of percentages of taxonomic groups differs significantly between the categories "animal kept" and "animal wished" (chi-square=46.1, df=3, p<0.001). The frequencies associated to percentages of taxonomic groups differ significantly from even for the categories "animal kept" (chi-square=576, df=4, p<0.001) and "animal wished" (chi-square=302, df=3, p<0.001).

Extraction levels for the pet market

Steps toward a first estimate

First approach:

- 19.5% of people who keep wildlife, obtained a wild animal last year.
- Given that at least 140.200 parrots are currently kept as pets in Costa Rica, and that 19.5% were obtained last year, then the yearly recruitment rate of parrots into households is of at least 27.339 individuals.

Second approach:

- The median, current residence time of a wild animal in a household is 2 years (n=290).
- Assumption: current residence time is on average half of the total life expectancy at home (i.e. 4 years).
- There are no commercial, captive breeding programs of parrots in Costa Rica. All of these pets come from the wild.
- If the average life expectancy of a wild animal in a household is four years, then one quarter of the captive population would disappear each year. An annual recruitment rate of about 35.050 parrots would be required, in order to maintain constant the total of 140.200 parrots in households. About one half of this rate would correspond to replacements and the other half to first acquisitions.
- This estimate of the extraction rate from natural populations is conservative for at least two reasons: (1) There are households that keep more than one parrot, and therefore the national total is probably higher than the estimate shown above, and (2) the annual recruitment rate does not take into account the mortality associated with the extraction process and trade.

In conclusion, the annual recruitment rate of parrots into the pet market within Costa Rica is at least in the order of 27.000 to 35.000 individuals, all of which are taken from the wild.

Fig. 57. Extraction of animals from the wild for the pet market - an estimate.

Conclusions

Wild animals are commonly kept in Costa Rican households as pets. This illegal practice is widespread, but tends to be more pronounced in urban environments, in households with garden and where the adults grew up in the company of wild pets. The vast majority of wild animals kept are parrots and parakeets. The animals are typically kept singly and in small cages. Aesthetic appeal is the main reason to keep wildlife. Just over half of the Costa Rican population disapproves of the keeping of wild animals at home, mainly because of ethical concerns.

At least three critical issues arise from the facts revealed by the study: (1) the wellbeing of the animals is compromised, (2) renewal rates resulting in high extraction levels from the wild may compromise the survival of natural populations, and (3) a profound misunderstanding about the cognitive abilities, as well as social and environmental requirements of the wildlife, leads people to assume that their wild pet is feeling well. The study provides the basis for the efficient design of awareness and information initiatives. This report may serve as a quantitative and conceptual framework of reference for future studies about this topic in other countries.

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