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Understanding the social dynamics of exotic pet ownership in Brazil: insights from an online survey on legal and illegal trade

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Abstract: Illegal wildlife trade is a multi-billion-dollar industry with profound ecological and social consequences worldwide. Recognizing that a multidisciplinary approach is essential to address this issue, this study aimed to understand the social dynamics of exotic pet consumption in Brazil, focusing on consumer preferences, motivations, and education. A cross-sectional anonymous online survey collected 1,706 responses. Results showed that 88.3% of respondents knew someone who owned or currently owns an exotic pet, while 48.9% had owned or currently own one. Moreover, 63.6% expressed interest in owning an exotic pet in the near future. Men, individuals aged 30–49, and respondents with higher education were more likely to own or desire to own exotic pets, both legally and illegally. Among those who owned illegal pets, most reported that the animal died or was surrendered, while about 10% were released or the animal had escaped. The price gap between legal and illegal pets significantly influenced acquisition decisions: although 40% chose legal pets despite higher costs, when the gap reached 10-fold, preferences split evenly. About 50% of the responders answered questions about wildlife legislation correctly, reflecting limited legal awareness and the cultural normalization of wildlife trade in Brazil. These findings indicate that the scarcity of affordable legal pets and the high compliance costs for breeders drive consumers toward illegal markets, while low reporting rates hinder enforcement. Strengthening environmental education, promoting legal awareness, and reducing the economic gap between legal and illegal markets may foster responsible ownership and support multidisciplinary strategies to mitigate domestic illegal wildlife trade.
Keywords: Conservation, responsible pet ownership, traffic, wildlife.

1. Introduction

Wildlife trade represents a multi-billion-dollar global industry, involving the annual trade of millions of fungi, plants, and animals for timber, medicines, fashion items, food, and pets worldwide. Brazil, one of the most biodiverse countries and a global hotspot for wildlife, plays a central role in both the supply and demand sides of wildlife trade, reflecting its ecological richness and strong domestic market for fauna. Among these activities, illegal wildlife trade stands out as one of the most lucrative forms of illicit commerce worldwide (Herrel & van der Meijden, 2014; Hughes, 2021; Nijman, 2010; Robinson et al., 2015; Smith et al., 2009). The global value of this illegal trade—encompassing hunting, logging, fishing, and trafficking in wild fauna and flora—is estimated at USD 91-258 billion annually (Hughes, 2021; Sas-Rolfes et al., 2019; Scheffers et al., 2019; South & Wyatt, 2011). Moreover, it has been increasingly linked to other forms of transnational organized crime (Felbab-Brown, 2018; Massé et al., 2020; van Uhm, 2021).

Beyond its economic magnitude, illegal wildlife trade has profound ecological and social consequences, posing a severe threat to biodiversity, particularly in Africa, Asia, and South America (Alves et al., 2013; Challender et al., 2014b; Karesh et al., 2005; Scheffers et al., 2019; Smith et al., 2019; Sutherland et al., 2019). It is estimated that one in four species on Earth is affected by the wildlife trade. Vertebrates are the most traded animal group, with fish accounting for more than half of these species, primarily as food. Amphibians, reptiles, and birds are also widely traded as pets, with amphibians being the most threatened vertebrate group (Scheffers et al., 2019).

The illegal or unsustainable trade of exotic species (i.e., non-domesticated animals kept as pets) undermines global conservation efforts (Altherr & Lameter, 2020; Auliya et al., 2016; Nijman et al., 2018; UNODC, 2016). The pet trade has expanded substantially in recent decades, both internationally and domestically (ABINPET, 2023; Bush et al., 2014), raising concerns over animal welfare (Peng & Broom, 2021; Sollund, 2011), biological invasions (Lockwood et al., 2019), and zoonotic disease risks (Chomel et al., 2007). Although international trade has shifted from wild-sourced to captive-sourced products, driven by trade treaties, import bans, and breeding programs (Harfoot et al., 2018; Jepson & Ladle, 2005; Robinson et al., 2015), millions of wild animals are still traded each year. Meso- and Latin America remain major exporting regions, with large proportions of wild-caught and ranched individuals (Hughes, 2021; Robinson et al., 2015). In Brazil alone, at least 38 million animals are captured from the wild annually, and around four million are traded illegally, mainly in domestic markets (Destro et al., 2012; Maximo et al., 2021; RENCTAS, 2001).

From a social perspective, illegal domestic wildlife trade in Brazil is typically characterized as disorganized crime composed of transient networks rather than hierarchical organizations. These involve catchers or breeders, resellers, and consumers (Oliveira et al., 2020; Wyatt et al., 2020), often relying on opportunistic intermediaries—such as truck drivers, border officials, or couriers—who facilitate trade without belonging to structured criminal groups (Pires & Moreto, 2011; Wyatt et al., 2020). While this market is mainly in rural areas and small towns, its products often reach large urban centers such as São Paulo, where demand is higher

(Alves et al., 2013; Magalhães & São-Pedro, 2012; Oliveira et al., 2020). Although CITES regulates high-value international wildlife trade, a large portion of the domestic pet market remains unregulated and largely uninspected (Hughes, 2021).

In Brazil, despite robust regulations on exotic pet ownership, illegal trade in native and non-native reptiles, amphibians, and birds remains widespread (Alves et al., 2019; Magalhães & São–Pedro, 2012; Maximo, 2021; Pistoni & Toledo, 2010). Many authors emphasize the need for a multidisciplinary approach to combat illegal wildlife trade, engaging government agencies, NGOs, researchers, managers, and local communities (Challender et al., 2014a, 2014b; Fonseca et al., 2021; Magalhães & São-Pedro, 2012; Moorhouse et al., 2017; Siriwat, 2019; van Uhm, 2021; Veríssimo et al., 2012; Wyatt et al., 2020).

Understanding consumer behavior remains pivotal for effective conservation policies (Challender et al., 2015; Veríssimo et al., 2020). Specifically, analyzing social dynamics of exotic pet consumption—including preferences, demand, social marketing, and education—is essential for developing strategies to mitigate domestic illegal trade in Brazil (Abensperg-Traun, 2009; Challender, 2014b; Drury, 2011; Phillip et al., 2009; Veríssimo et al., 2012). However, few quantitative studies have examined the demographic and attitudinal profiles of exotic pet consumers in Brazil, despite Brazil's relevance to both regional and global wildlife trade. Empirical data on consumer motivations and market behavior remain scarce, limiting the development of evidence-based demand-reduction strategies. Since motivations shape behavior and responses to conservation strategies (Thomas-Walters et al., 2020a, 2020b), identifying these factors is crucial.

Therefore, this study aims to (1) characterize the profile of legal and illegal exotic pet owners in Brazil, (2) assess the population's knowledge of legislation on exotic pets, and (3) identify the primary motivations driving illegal exotic pet acquisition in the country. By addressing these points, the research contributes to ongoing efforts in enforcement, environmental education, and demand-reduction campaigns aligned with national biodiversity strategies and CITES objectives, providing actionable insights for interdisciplinary policy development.

2. Materials e Methods

An anonymous online survey was developed using Google Forms (Google Inc.) to collect data on exotic pet ownership and perceptions of wildlife trade in Brazil. The study was approved by the Research Ethics Committee and registered in the Brazilian National Research Ethics Platform (Plataforma Brasil) under protocol number 70587923.9.0000.0093/2023.

Survey design and distribution

The questionnaire was available in Portuguese from June to December 2021, took approximately ten minutes to complete, and was disseminated using the snowball sampling technique (Newing et al., 2011). Initial participants included exotic pet owners and individuals or organizations involved with wildlife trade, who were encouraged to share the survey link within their personal and professional networks. This approach enabled the recruitment of successive participants beyond the researchers' direct reach and facilitated access to a broad range of social and geographic groups across the country. The survey was initially shared through three main channels: experts and non-governmental organizations working with wildlife trade were invited to distribute it among known exotic pet owners and independent groups; administrators of online communities and exotic pet networks were contacted to circulate the link within their internal communication channels; and targeted social media posts were used to increase participation in underrepresented regions.

Participants and structure of the survey

To ensure geographic representation, screening questions were included regarding the respondents' state of residence, age, gender, and educational level. Only individuals aged 18 years or older and residing in Brazil were eligible to participate. The questionnaire began with questions about exotic pet ownership, including whether respondents themselves or someone they knew owned a legal or illegal exotic pet, and whether they were interested in owning one. Participants were also asked whether they had ever reported someone for owning illegal wildlife. They were presented with two questions to assess their knowledge of current legislation on the voluntary surrender or legalization of illegal pets. Those who reported having owned an illegal exotic pet were further asked about the fate of the animal (death, surrender, release, or escape) and their likelihood of acquiring another illegal pet. Respondents expressing interest in owning exotic pets were asked to rate, on a 10-point Likert-type scale (Likert, 1932), their preference for acquiring a legal or illegal animal according to relative acquisition costs. The first question assumed equal prices, followed by scenarios in which legal pets were twice, ten times, or twenty times more expensive than illegal ones. To assess motivations for exotic pet ownership, respondents indicated their agreement with 13 statements using a five-point Likert-type scale ranging from "strongly disagree" to "strongly agree." Participants who reported owning an illegal exotic pet were also invited to describe, in an open-ended response, their reasons for doing so. The complete questionnaire is available in the Supplementary Material.

Statistical analysis

Data were compiled and analyzed using IBM SPSS Statistics (version 26). Multiple logistic regression models were applied to identify factors predicting exotic pet ownership and knowledge of wildlife legislation. In the first models, variables related to pet ownership and the reporting of illegal wildlife trade were analyzed simultaneously, controlling for respondents' age, gender, and educational level. In the second model, only age and education were included to examine knowledge of legislation, as gender was not expected to influence this variable. For Likert-type scale data, the Shapiro–Wilk test was applied to assess normality. Since the data were not normally distributed, the Friedman test was used to compare median preferences across different relative price scenarios. Descriptive statistics, including absolute and relative frequencies, were used for all other categorical variables.

3. Results

A total of 1,706 valid responses were collected and included in the analysis. Respondents represented all 27 Brazilian states, with the highest participation originating from southeastern and southern Brazil (Figure 1). Detailed demographic characteristics, frequencies of legal and illegal exotic pet ownership, and results of the logistic regression analysis are presented in Table 1. Overall, exotic pet ownership was common among respondents, and men, individuals aged 30–49 years, and those with higher educational attainment were significantly more likely to report ownership of exotic pets.

Among respondents who had owned illegally acquired animals, the most frequently reported outcome was that the animal remained in their possession. Other commonly reported outcomes included animal death and voluntary surrender due to legal or ethical concerns. Additional reported outcomes are presented in Table 2.

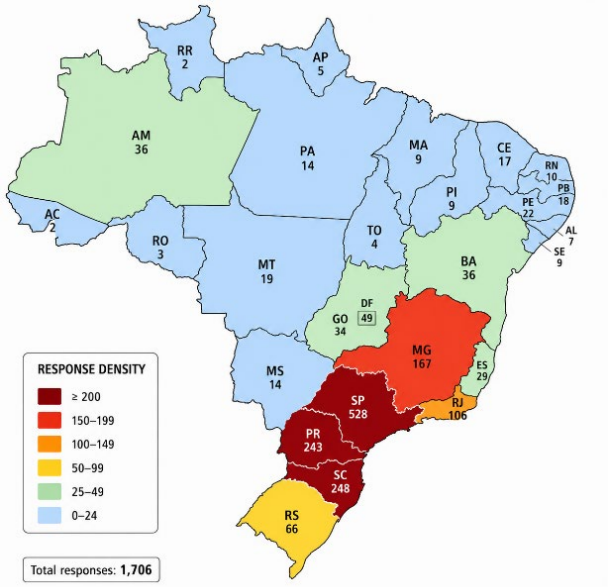

Figure 1 – Heat map showing the distribution of survey responses across the 27 Brazilian federal units. Colors represent response density by state, ranging from 0–24 responses (light blue) to ≥200 responses (dark red). A total of 1,706 responses were included in the analysis.

Variable	Do you own or ever owned a LEGAL exotic pet?				
	Total	**Yes (n=508)**	**No (n=1094)**	**OR (95% CI)**	**p-value[a]**
Age					
18 - 29 years old	**1167**	348 (29.82%)	819 (70.18%)	Reference	-----
30 - 49 years old	**372**	146 (39.25%)	226 (60.75%)	1.304 (1.003-1.695)	0.047
50+ years old	**63**	14 (22.22%)	49 (77.78%)	0.611 (0.329-1.135)	0.119
Gender					
Female	**943**	262 (27.78%)	681 (72.22%)	Reference	-----
Male	**648**	243 (37.50%)	405 (62.50%)	1.577 (1.270-1.959)	0.000
Other	**11**	3 (27.27%)	8 (72.73%)	1.131 (0.292-4.381)	0.858
Scholarity					
Elementary School	**172**	44 (25.58%)	127 (74.42%)	Reference	-----
High School	**751**	219 (29.16%)	532 (70.84%)	1.248 (0.851-1.831)	0.256
Superior or Postgraduation	**680**	245 (36.03%)	435 (63.97%)	1.641 (1.103-2.443)	0.015
Variable	**Do you own or ever owned an ILLEGAL exotic pet?**				
	Total	**Sim (n=467)**	**No (n=1134)**	**OR (95% CI)**	**p-value[a]**
Age					
18 - 29 years old	**1168**	314 (26.88%)	854 (73.12%)	Reference	-----
30 - 49 years old	**369**	133 (36.04%)	236 (63.96%)	1.230 (0.937-1.614)	0.136
50+ years old	**64**	20 (31.25%)	44 (68.75%)	1.112 (0.631-1.959)	0.714
Gender					
Female	**951**	213 (22.40%)	738 (77.60%)	Reference	----
Male	**639**	251 (39.28%)	388 (60.72%)	2.350 (1.877-2.941)	0.000
Other	**11**	3 (27.27%)	8 (72.73%)	1.616 (0.415-6.293)	0.489
Scholarity					
Elementary School	**170**	36 (21.18%)	134 (78.82%)	Reference	----
High School	**753**	196 (26.03%)	557 (73.97%)	1.487 (0.984-2.247)	0.060
Superior or Postgraduation	**678**	235 (34.66%)	443 (65.34%)	2.168 (1.415-3.321)	0.000

[a] Significance of difference compared with reference category

Table 1 – Data of legal and illegal exotic pet ownership based on an online questionnaire in Brazil, stratified by age, gender and scholarity and presented by total and relative frequencies.

Fate of the animal	Responses
Still owned by respondent	160 (35%)
Animal died	108 (23%)
Surrendered due to legal restrictions	86 (19%)
Handed over for ethical reasons	82 (18%)
Donated to another person	70 (15%)
Released or escaped	59 (13%)
Surrendered due to welfare concerns	45 (10%)

Table 2 – Reported fate of illegally acquired exotic pets among respondents who had owned at least one illegally sourced animal (n = 461) in Brazil. Values are presented as total and relative frequencies of respondents. Multiple responses were allowed; therefore, the sum of percentages exceeded 100%.

Interest in owning exotic pets was high among respondents. Logistic regression analysis demonstrated significant effects of gender, age, and education level on this outcome (Table 3). In general, younger respondents, men, and participants with lower educational attainment were more likely to express interest in owning exotic pets. Motivations for acquiring illegally sourced exotic pets are presented in Table 4. Most respondents indicated that there was no justification for purchasing an animal illegally, whereas lower prices, perceived animal rescue, accessibility, and greater species availability were the most frequently cited motivations.

Variable		Would have	Wouldn't have	OR (95% CI)	P-value[a]
Age	**Total**	**n = 1084**	**n = 598**		
18 - 29 years old	**1234**	849 (68.80%)	385 (31.20%)	Reference	----
30 - 49 years old	**381**	213 (55.91%)	168 (44.09%)	0.642 (0.496-0.829)	0.001
50+ years old	**67**	22 (32.84%)	45 (67.16%)	0.264 (0.154-0.452)	0.000
Gender					
Female	**1004**	592 (58.96%)	412 (41.04%)	Reference	-----
Male	**665**	484 (72.78%)	181 (27.22%)	1.815 (1.460-2.256)	0.000
Other	**13**	8 (61.54%)	5 (38.46%)	0.961 (0.301-3.071)	0.970
Scholarity					
Elementary School	**183**	144 (78.69%)	39 (21.31%)	Reference	-----
High School	**795**	536 (67.42%)	259 (32.58%)	0.627 (0.423-0.929)	0.020
Superior or Postgrad	**704**	404 (57.39%)	300 (42.61%)	0.494 (0.329-0.742)	0.001

[a] Significance of difference compared with reference category

Table 3 – Results of respondents' interest in owning an exotic pet in Brazil. Data is stratified by age, gender and scholarity and presented by total and relative frequencies.

Motivation category	Description	Responses
Ethical motivations	Desire to rescue or save an animal	205 (19%)
Economic motivations	Lower purchase price	210 (19%)
Availability motivations	Easier accessibility	149 (14%)
Market motivations	Greater variety of species/mutations	124 (12%)
No justification	Respondents reporting no reason to acquire illegally	628 (58%)

Table 4 – Reported motivations for acquiring illegally sourced exotic pets in Brazil. Responses were grouped into thematic categories and presented as total and relative frequencies. Multiple responses were allowed; therefore, the sum of percentages exceeded 100%.

Among respondents interested in exotic pet ownership, willingness to acquire legally sourced animals decreased progressively as the price difference between legal and illegal animals increased (Figure 2). Although legal acquisition was strongly preferred when prices were similar, this preference declined substantially as the cost of legally sourced animals increased.

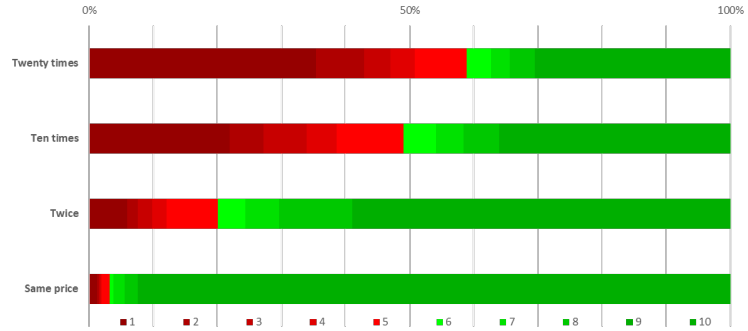

Figure 2 – Respondents likelihood to acquire legal (green) or illegal (red) pets according to the price gap – same price, legal pets twice, ten times and twenty times more expensive than illegal animals in Brazil. Data is presented in a Likert scale from 1 to 10, where 1 is extremely likely to acquire an illegal pet and 10 extremely likely to acquire a legal pet.

Knowledge of Brazilian wildlife legislation varied among respondents. Results of the legislation questions and the associated logistic regression analyses are presented in Table 5. Educational level was the main variable associated with correct responses, whereas age and gender showed limited influence.

Finally, only a small proportion of respondents reported having previously reported illegal exotic pet ownership. No significant associations were detected between reporting behavior and the demographic variables evaluated (Table 6).

Variable	What happens if you volunteer surrender an illegal pet? Total	Correct (n=896)	Wrong (n=152)	OR (95% CI)	p-value[a]
Age					
18 - 29 years old	**767**	656 (85.53%)	111 (14.47%)	Reference	-----
30 - 49 years old	**240**	209 (87.08%)	31 (12.92%)	1.011 (0.632-1.617)	0.962
50+ years old	**41**	31 (75.61%)	10 (24.39%)	2.098 (0.977-4.503)	0.057
Scholarity					
Incomplete 1st degree	**94**	67 (71.28%)	27 (28.72%)	Reference	-----
High School	**492**	429 (87.20%)	63 (12.80%)	0.364 (0.216-0.613)	0.000
Superior or Postgraduation	**462**	400 (86.58%)	62 (13.42%)	0.367 (0.210-0.640)	0.000
Variable	**Is it possible to legalize an illegal pet? Total**	**Correct (n=801)**	**Wrong (n=389)**	**OR (95% CI)**	**p-value[a]**
Age					
18 - 29 years old	**892**	594 (66.59%)	298 (33.41%)	Reference	
30 - 49 years old	**252**	179 (71.03%)	73 (28.97%)	1.13 (0.815-1.567)	0.476
50+ years old	**46**	28 (60.87%)	18 (39.13%)	0.7 (0.377-1.301)	0.290
Scholarity					
Incomplete 1st degree	**125**	83 (66.40%)	42 (33.60%)	Reference	----
High School	**561**	364 (64.88%)	197 (35.12%)	1.079 (0.716-1.627)	0.716
Superior or Postgraduation	**504**	354 (70.24%)	150 (29.76%)	0.857 (0.555-1.323)	0.485

[a] Significance of difference compared with reference category

Table 5 – Results of the legislation questions. Data is stratified by age and scholarity and presented by total and relative frequencies. Multiple logistic regression analysis was performed including all variables in the model.

Variable	Total	Yes (n=173)	No (n=1532)	OR (95% CI)	P-value[a]
Age					
18 - 29 years old	**1241**	127 (10.13%)	1127 (89.87%)	Reference	-----
30 - 49 years old	**380**	36 (9.38%)	348 (90.63%)	0.769 (0.508-1.166)	0.216
50+ years old	**66**	10 (14.93%)	57 (85.07%)	1.326 (0.648-2.710)	0.440
Gender					
Female	**1004**	98 (9.66%)	916 (90.34%)	Reference	-----
Male	**670**	73 (10.77%)	605 (89.23%)	1.170 (0.846-1.617)	0.342
Other	**13**	2 (15.38%)	11 (84.62%)	1.708 (0.363-8.024)	0.498
Scholarity					
Elementary School	**183**	18 (9.84%)	165 (90.16%)	Reference	-----
High School	**796**	69 (8.60%)	733 (91.40%)	0.923 (0.530-1.608)	0.778
Superior or Postgraduation	**708**	86 (12.04%)	628 (87.96%)	1.421 (0.807-2.502)	0.223

[a] Significance of difference compared with reference category

Table 6 – Results if the respondents have ever reported illegal exotic animal ownership. Data is stratified by age, gender and scholarity and presented by total and relative frequencies. Multiple logistic regression analysis was performed including all variables in the model.

4. Discussion

The domestic wildlife trade in Brazil poses a significant threat to native fauna and remains a major enforcement challenge for national agencies. Understanding consumer demand is therefore central to designing effective responses to illegal wildlife trade. Brazil and other Latin American countries have a strong cultural tradition of keeping exotic pets; in our sample, nearly half of the respondents had owned one, and almost 90% knew someone who had. This is particularly concerning, given that one-third reported owning an illegal pet and two-thirds knew someone who had. Addressing this problem requires a comprehensive approach, as evidence indicates that national markets can operate independently of international trade flows (Daut et al., 2015). Characterizing domestic trade patterns is thus essential to support national interventions. Although domestic trade has historically been concentrated in the North and Northeast, it permeates the entire country and meets demand in major urban centers, notably São Paulo (RENCTAS, 2001). Given that Southeastern states comprise a large share of our sample, these findings likely capture a substantial share of domestic demand. Moreover, the widespread familiarity with exotic pet ownership across the country suggests that wildlife keeping has become culturally normalized rather than perceived as an illicit or marginal practice, reinforcing the need to address this issue not only through enforcement but through social awareness strategies.

Consistent with prior literature, younger respondents expressed greater interest in exotic pet ownership (Cronin et al., 2022), and evidence suggests they show stronger affective responses toward animals (Kellert, 1993). One plausible explanation is the heightened exposure to exotic pets on social media, which may shape generational norms and preferences (Cronin, 2022; Moloney, 2021; Nekaris, 2013; Siriwat, 2019). Whether this interest declines with age cannot be confirmed by cross-sectional data; longitudinal designs would be required to test this hypothesis (Cronin, 2022; Kellert, 1993).

Although several studies report that women derive greater benefits from pet ownership and exhibit stronger affiliative attitudes toward animals (Czech, 2002; Herzog, 2007; Kellert, 1987; Mathew, 1997), men in our sample were more likely to show interest in

exotic pets. Prior work links male preferences to taxa associated with fear or predation—such as snakes and spiders (Cronin, 2022; Fredrikson, 1996; Kellert, 1987; Knight, 2008; Myers, 2004; Prokop & Tunnicliffe, 2008)—whereas this pattern is less evident for "friendlier" exotic species (Cronin, 2022). In Brazil, the popularity of reptiles—especially snakes—together with historical restrictions on legal trade for other groups (e.g., amphibians and many lizards) may help explain the observed male bias (Alves et al., 2019; Magalhães & São-Pedro, 2012). Men were also more likely to own illegal pets, a tendency reported among poachers and apparently extending to wildlife consumers (Wyatt et al., 2020). Interestingly, respondents with higher levels of education were also more likely to acquire illegal pets, despite the common assumption that education promotes environmental awareness. This paradox may reflect a perception of "controlled risk" or moral justification among more educated individuals who believe they can informally ensure welfare or legality, highlighting a disconnect between knowledge and compliance.

More than one-third of respondents expressed interest in owning exotic pets. Not all intentions will translate into ownership, but the popularity of non-traditional pets is increasing (Cronin et al., 2022; ABINPET, 2023), potentially driven by ease of maintenance, lower acquisition costs, reduced space and time demands, and amplified visibility on social media (Alves et al., 2019; Bush et al., 2014; Cronin et al., 2022). Conversely, the absence of a national positive "Pet List" (i.e., a list of species legally permitted as pets) constrains legal availability (Fonseca et al., 2021). In such contexts, consumers frequently turn to illegal markets (Oliveira et al., 2020; Wyatt et al., 2020). This tendency reinforces the finding that legal scarcity and affordability gaps, more than ignorance of the law, are central drivers of consumer behavior in Brazil.

Where legal and illegal markets coexist under weak regulation, demand can fuel illegality. Some consumers knowingly purchase illegal animals, underscoring that blanket bans alone are insufficient (Rivalan et al., 2007; Siriwat et al., 2019). As in other studies, price emerged as a dominant driver (Alves et al., 2019; Burivalova et al., 2017; de Oliveira et al., 2020): with each increment in the legal–illegal price ratio, a proportion of consumers shifted toward illegal options. When prices were equal, >95% preferred legal pets, yet ~5% still preferred illegal sources. Prior research suggests that beliefs about the superiority of wild-caught animals (genetics, morphology, behavior) and perceptions that laws overprotect species may sustain illegal demand irrespective of price (Brooks et al., 2010; Burivalova et al., 2017; Oliveira et al., 2020; Siriwat et al., 2019; Sung & Fong, 2018). Accessibility, rarity, and diversity of species/morphs also motivate illegal purchases globally and were frequently cited here (Altherr & Lameter, 2020; Courchamp et al., 2006; Gault et al., 2008; Hall et al., 2008; Johnson et al., 2010; Lyons & Natusch, 2013; Siriwat, 2019). Notably—and to our knowledge, not previously emphasized—almost 20% reported keeping illegal pets to "save" animals (e.g., rescuing from the wild or from previous owners, or accepting donations). This may be partly driven by respondents with biological or veterinary backgrounds who perceive a duty or capacity to help despite lacking official authority. On the other hand, the majority (58%) of respondents who claimed to have "no reason" for acquiring illegal pets reveals a normalization of this behavior — suggesting that, for many, illegality itself is no longer perceived as a barrier or moral conflict, but rather as a socially tolerated practice. This result reinforces the interpretation that wildlife trade in Brazil operates within a permissive cultural environment.

When legal pets cost no more than twice as much as illegal counterparts, over 80% of consumers favored legal, captive-bred animals. However, in Brazil, the bureaucratic and financial barriers to establishing licensed breeding facilities can render legal animals ten times more expensive than wild-caught ones (Alves et al., 2013), a tipping point at which preferences split roughly evenly. Even at a twenty-fold price differential, >40% still preferred the legal option, indicating that normative and legal considerations can outweigh cost, accessibility, or rarity for a substantial subset of consumers. Conversely, scarcity of legal, affordable pets—combined with the ease of illegal acquisition—directly sustains illegal trade (Ding et al., 2008; McNeely et al., 2009; Thạch et al., 2018). Expanding access to affordable captive-bred animals tends to shift demand toward legal markets (Brooks-Moizer et al., 2009; Jepson & Ladle, 2005; Oliveira et al., 2020). These findings highlight a pragmatic policy opportunity: balancing regulation with economic accessibility could be more effective than stricter prohibitions alone, particularly when demand is already socially embedded.

Education remains a key tool for countering domestic illegal trade (Fonseca et al., 2021). Campaigns emphasizing legal consequences appear more effective at reducing demand than those focused solely on ethics (e.g., welfare or extinction risks) (Moorhouse et al., 2017). Roughly half of our respondents answered legal questions correctly, but more granular knowledge (e.g., penalties, fines, imprisonment) was not assessed and merits future investigation. Interestingly, respondents with elementary education performed better in legal knowledge questions than those with higher education, suggesting that awareness may derive from exposure to enforcement narratives rather than formal schooling. This underscores that educational campaigns should target behavioral drivers and information gaps rather than relying solely on educational attainment as a proxy for awareness.

Only 10% reported having ever reported an illegal wildlife practice—far below the 78.5% willingness to report poaching observed in a U.S. study (Leavitt et al., 2021). Several factors could explain this gap. Urban residents are more likely to report than rural residents and are more inclined to contact government rather than nonprofit channels; crimes against pets are also perceived as more serious than those against wildlife (Leavitt et al., 2021; Wagner et al., 2019). Additionally, individuals in areas with frequent violations, higher tolerance to associated risks, and/or precarious economic conditions may be less likely to report and may distrust criminal justice institutions (Brown & Benedict, 2002; Leavitt et al., 2021). These dynamics are likely salient in a developing-country context such as Brazil. Importantly, our question captured past reporting behavior—not willingness to report—so discrepancies between stated intentions and actions should be expected. Although men often engage in higher-risk, direct interventions while women favor indirect actions (e.g., calling authorities) (Eagly & Crowley, 1986; Nicksa, 2014; Salminen & Glad, 1992), we detected no gender differences in reporting illegal exotic pets. The combination of widespread awareness of illegal

ownership and extremely low reporting rates suggests a high level of social tolerance and a lack of deterrence—one of the most important behavioral barriers to reducing illegal wildlife trade.

Given that environmental agencies in Brazil and elsewhere are typically understaffed, public participation is a critical pillar of multi-pronged strategies against illegal trade. The relatively high proportion of Brazilian breeders with biological or veterinary training—compared with Europe and the United States—presents an opportunity to strengthen discourse and environmental awareness in schools, universities, and communities, particularly among children and future wildlife professionals (Fonseca et al., 2021; Alves et al., 2019; Awasthy et al., 2012; Beery & Jørgensen, 2016).

Abandonment remains a central concern in exotic pet ownership. Owners may relinquish animals due to regret, loss of interest, or fear of legal consequences (Souza et al., 2007). Brazilian law permits the voluntary surrender of exotic animals, legal or illegal, to environmental agencies at any time without penalty. Over half of respondents recognized this option, and interestingly, those with elementary education were most likely to answer correctly, suggesting that legal knowledge is not strictly correlated with formal education. Nevertheless, abandonment persists among respondents who owned illegal pets; more than 10% stated that animals had escaped or been released. Whether accidental or intentional, releases contribute to invasion risks (Pyšek et al., 2010; Romagosa, 2015). Not every release leads to establishment; outcomes depend on complex species–environment interactions. Priorities for future work include identifying the main taxa being released in Brazil to better assess and manage invasion risks (Fonseca et al., 2021; Stohlgren & Schnase, 2006; Thuiller et al., 2006).

Finally, the study's cross-sectional, online snowball design entails limitations. Snowball sampling can amplify homophily, and online recruitment may under-sample populations with limited internet access (Leighton et al., 2021). Selection bias is also plausible if individuals involved with exotic pets were more motivated to participate. Social desirability bias may have influenced responses to sensitive questions about illegal ownership. Even so, the large nationwide sample (n = 1,706) spanning all Brazilian states likely mitigates some biases and provides valuable insight into consumer dynamics within the domestic market.

5. Conclusion

This study demonstrates that a complex interplay of cultural normalization, economic asymmetries, and behavioral tolerance sustains legal and illegal wildlife trade in Brazil. Exotic pet ownership remains widespread, particularly among men and younger generations, reflecting both generational trends and a socially accepted perception of wildlife ownership. Higher levels of education do not necessarily reduce demand for illegal pets, suggesting that academic degrees alone are insufficient to ensure compliance when cultural and economic incentives prevail. Beyond legal considerations, keeping exotic pets also raises important ethical concerns regarding animal welfare, as many species have highly specialized behavioral, environmental, and social needs that are difficult to meet in captivity. Furthermore, the movement and maintenance of exotic animals may increase the risk of zoonotic disease transmission and expose owners and veterinarians to health challenges, particularly when species-specific medical knowledge and evidence-based treatment protocols remain limited or poorly established. The persistence of illegal trade is reinforced by limited access to affordable legal alternatives, weak law enforcement, and low rates of public reporting, which collectively reduce deterrence. Addressing these challenges requires coordinated actions that go beyond prohibition: strengthening environmental education focused on the legal and ecological consequences, establishing a national list of species authorized for trade, expanding accessible, stigma-free channels for voluntary surrender, and promoting public engagement in reporting environmental crimes. Such integrated measures are essential for aligning social behavior with conservation goals and mitigating the long-standing impact of the domestic wildlife trade on Brazil's biodiversity.

6. References

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