

Pigeons (*Columba livia*) in an urban square: what can we learn from local people's knowledge and perception?

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Resumo

POMBOS (*COLUMBA LIVIA*) EM UMA PRAÇA URBANA: O QUE PODEMOS APRENDER A PARTIR DO CONHECIMENTO E DA PERCEPÇÃO DAS PESSOAS LOCAIS? Os pombos exóticos (*Columba livia*) estão entre os mais adaptados animais urbanos do mundo que causam incômodo e são fontes potenciais de doenças. Este estudo apresenta dados de dois períodos de entrevistas (2002 e 2008) explorando os problemas causados por esses animais às pessoas locais em uma pequena praça urbana, localizada na cidade de Campina Grande, nordeste do Brasil. Em 2002, os resultados mostraram uma dualidade clara de discernimento entre os participantes, enquanto em 2008, uma discriminação mais clara foi observada em suas respostas. Essas diferenças sugerem que os problemas aumentaram na praça estudada e que as pessoas estão se tornando mais atentas à problemática, apesar de que, suas percepções ainda são bastante limitadas.

PALAVRAS CHAVE: Brasil, Columbiformes, ecologia urbana, pragas urbanas.

Abstract

The exotic pigeons (*Columba livia*) are amongst the most adapted urban animals worldwide which cause nuisance and are potential sources of diseases. This study presents data from two interview instances (2002 and 2008) in which local people were asked questions regarding the problems caused by these animals in a small urban square, located in Campina Grande city, northeast of Brazil. In 2002, the results showed a clear duality of discernment among the participants, whereas in 2008, a clearer discrimination was observed in their answers. The differences suggest that the problems may have increased on the studied urban square and that people are becoming more aware of the problems caused by these animals, albeit their perception is somewhat limited.

KEY WORDS: Brazil, Columbiformes, urban ecology, urban plagues.

Introduction

Pigeons (*Columba livia*) are amongst the most conspicuous urban birds, ubiquitously present in many cities worldwide (Goodwin, 1983; Skutch & Gardner, 1991; Marques et al., 2007). This exotic species is descended from domesticated pigeons originated from Europe in the early 1600s, but has been well adapted to the various environmental and climatic conditions of all continents of the world since (Goodwin, 1983; Skutch & Gardner, 1991).

Their well established proliferation to urban landscapes has been made easy due to many of their biological attributes. Due to their domesticated history, they are not distressed by human presence and urban disorder (such as noise and pollution), they readily nest in man made structures, have a broad diet and have disordered reproduction with year-round breeding episodes (Skutch & Gardner, 1991; Bonini, 2003). Furthermore, another highly important trait comes from their movement strategies. Albeit they are able to fly relatively long distances, these pigeons tend to settle nearby their birth site throughout their lifespan. As a consequence of these biological

attributes, pigeons are highly plastic birds, being easily able to cope with environmental shifts and urban disorder (Geis, 1976; Skutch & Gardner, 1991).

The proliferation of these animals in cities worldwide has been a major issue regarding animal nuisance in urban areas, and untold millions of dollars are spent every year to minimize this crisis, particularly regarding public health concerns (Bonini, 2003). Among these nuisances to humans and to urban environments are their disruptive presence and noise, the problems caused by their fecal droppings and the resulting transmission of diseases (Acha & Szyfres, 1989; Benenson, 1992; Silveira, 2008). Despite these scientifically confirmed negative consequences of the presence of pigeons in cities, some people still perceive these birds as amusing animals and not as urban plagues, not realizing that they can be just as harmful as rats and other 'more obvious' plagues (Silveira, 2008). However, this type of data has not been thoroughly investigated and information regarding local people's perception about urban plagues is currently missing worldwide.

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This study presents comparative data from interviews made with local people regarding the problems caused by the pigeon *C. livia* in a small city square located in Campina Grande city, northeast of Brazil.

Material and Methods

Study area

The interviews were made within the perimeters of a small (~3,500 m² area) city square (Praça da Bandeira: *Flag Square*) located in Campina Grande city, Paraíba State, Brazil. Although not officially recognized, it is also known as the *Pigeon Square* (Praça dos Pombos). Due to its central location, this small urban square houses space for leisure, social and political events of small proportions and small commercial facilities. Feeding the pigeons is a common amusement by many occupants, especially children with their parents. In fact, some nearby commercial establishments sell grains for people specifically aiming at feeding the pigeons.

Interview design

The interviews were carried out during two distinct episodes, in July of 2002 and in April of 2008, in which the same set of structured questions were made to each person. On each episode twenty people were interviewed. Prior to the interview each candidate was asked to answer questions regarding their history of urban square use, in order to select only the common users and avoid misinterpretation from non-users with unsuitable knowledge. Only adults (>20 years old) were interviewed and neither gender nor age were discriminated due to lack of significantly distinct patterns. To avoid bias, particularly during ambiguity events, all interviewers were completely isolated from each other. Furthermore, all questions had pre-established categorical answers in order to avoid subjectivity. These pre-established categories were based on pilot interviews done prior to the beginning of the first study period. The set of questions asked to each participant with each nominal categorical answer option are described in Table 1.

Table 1 Set of questions used to interview local people regarding the problems caused by the pigeons (*Columba livia*) in a small urban square of Brazil

Questions	Answer alternatives
A. Do pigeons interfere on the commercial business of the urban square?	Yes/No
B. Has the number of pigeons increased in the last year?	Yes/No
C. Are the hygienic conditions of the urban square satisfactory?	Yes/No
D. Have you ever witnessed an aggression to a pigeon by a human being?	Yes/No
E. Do you think the pigeons should be removed?	Yes/No
F. What are the main problems caused by the pigeons?	damage* /bad smell/noise/none
G. What types of problems have you been subjected from the pigeons?	Nuisance**/diseases/other***/none
H. Why do the pigeons live in the urban square?	Favorable conditions/unknown reason

*including pollution **due to fecal droppings ***repulsion, fear

Data analysis

From the resulting answers of the yes/no, and the multiple categories questions, binomial tests and G tests were performed, respectively (Sokal & Rohlf, 1994). The former (binomial test) tests the statistical significance of deviations from a theoretically expected observation from two categories, the null hypothesis being that these two categories are similarly expected to occur (a 50% chance in the present study). The latter (G test) compares the observed values with those expected from a null hypothesis and determines the probabilities that the gap differences between the observed and expected values were not due to chance alone (Sokal & Rohlf, 1994). These tests were performed on software Bioestat 5.0.

Results

The results from the yes/no questions made in 2002 indicated that people's perception of the problems caused by the pigeons were somewhat ambiguous (Figure 1). This duality was further confirmed by the results of the binomial test which were not significant (Figure 1). The results from the multiple categories questions made during this same year indicated that when asked question F, 60% of the interviewed answered 'damage', 10% answered 'bad smell', 5% answered 'noise' and 25% answered 'none'. This result was statistically unlikely to be due to chance alone (G test; $G=14.13$; $p<0.001$). When asked question G, 70% of the interviewed answered 'nuisance due to fecal droppings', 10% answered 'diseases', 0% answered 'other' and 20% answered 'none'. This result was also statistically unlikely to be due to chance alone (G test; $G=20.16$; $p<0.001$). When asked question H, 45% of the interviewed answered 'favorable conditions' and 55% answered 'unknown reason'. As clear, this result was not statistically significant (G test; $G=0.20$; $p=0.65$).

In 2008, the yes/no interviews indicated that the proportions of three of the five questions were significantly indistinct, while the other two were statistically dissimilar (Figure 1). The results from the multiple categories questions made during this same year indicated that when asked question F, 85% of the interviewed answered 'damage', 5% answered 'bad smell', 0% answered 'noise' and

10% answered 'none'. This result was statistically unlikely to be due to chance alone (G test; $G=31.50$; $p<0.001$). When asked question G, 45% of the interviewed answered 'nuisance due to fecal droppings', 15% answered 'diseases', 15% answered 'other' and 25% answered 'none'. This result was not statistically significant (G test; $G=4.45$; $p=0.23$). When asked question H, 80% of the interviewed answered 'favorable conditions' and 20% answered 'unknown reason'. This result was statistically unlikely to be due to chance alone (G test; $G=7.71$; $p<0.01$).

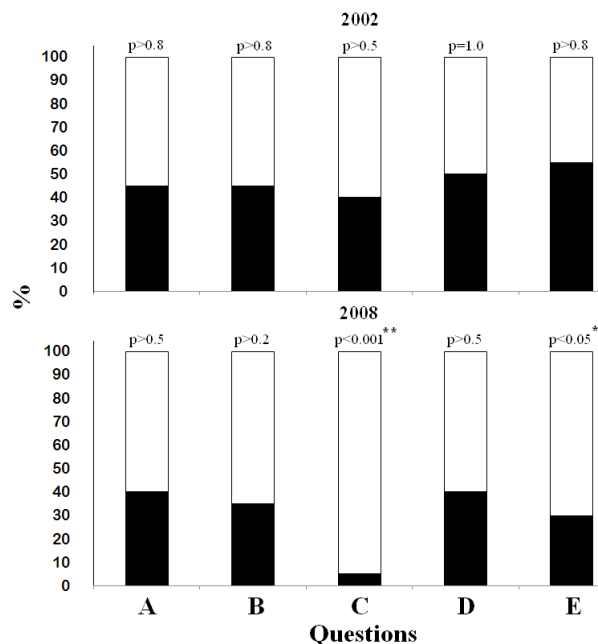


Figure 1 Proportions of the answers of five yes/no questions made during interviews in two instances (2002 and 2008) in a small urban square located in Campina Grande city, Brazil. Results of the binomial tests are indicated above each column. Refer to Table 1 for question's descriptions. * significant and ** highly significant.

Discussion

Clear differences were observed between the two interview instances. In 2002, the results from the yes/no questions showed a somewhat strong duality of discernment among the interviewed group, whereas six years later, in 2008, a clearer discrimination was observed from their answers. From the other questions, some shifts were also apparent.

Given the proper restrictions, a similar event as a shifting baseline may be apparent from the results of the present study. Shifting baseline is a recent term originated from fisheries (Pauly, 1995), which indicates the loss of perception throughout time by local people of a certain natural phenomenon. These differences suggest that new problems are encountered nowadays and that the conditions of the studied area may have suffered a considerable shift when it comes to pigeon-related problems. Interestingly,

although the people interviewed during the latter instance suggested that the problems had increased, the number of people who consider that the pigeons should not be removed number of people which does not think the pigeons should be removed highly increased in this period. This suggests that a substantial amount of people are still not properly informed on the serious problems these animals potentially cause, particularly, those concerning human health (Acha & Szyfres, 1989; Benenson, 1992; Silveira, 2008). In fact, some structures deliberately built on some parts of the studied urban square to house pigeons and to serve as nesting sites, imply that public authorities themselves have little information regarding this urban pest, stimulating its population growth, by providing proper conditions. Secondly, these differences may also suggest that people are becoming more aware about the problems caused by these animals, although, as stated above, their information is somewhat limited.

Although it was not the scope of this study, a rapid evaluation of the conditions in the area revealed somewhat ordinary problems regarding both public degradation, due particularly to fecal droppings, and human health threats, by the commonly observed encounter between human and animal. As indicated by most interviewers and suggested by other authors (Acha & Szyfres, 1989; Benenson, 1992; Graczyk et al., 2007; Silveira, 2008), pollution caused by fecal droppings is amongst the most harmful problems caused by the pigeons. Due to its highly corrosive composition (Silveira, 2008), the feces of these animals have damaged many structures of the urban square, such as the statues, benches and monuments. However, it is the contact between the pigeons and humans that may be the most hazardous problem, given the vast possibility of infections (Graczyk et al., 2007). These infections usually take place when one gets in contact with sites contaminated by their fecal droppings (Marques et al., 2007) and by inhaling spores (Graczyk et al., 2007). According to Benenson (1992), an evaluation of the problems caused by pigeons in a public urban square, showed that infection by toxoplasmosis (a disease caused by the protozoan *Toxoplasma gondii*) caused events of blindness, abortion and even death among some evaluated women, confirming the indirect threatening potential of these animals.

From the pigeon's habits and biological attributes discussed above, it is readily possible to outline some immediate approaches seeking a decrease on the population sizes of these animals inside urban areas. At first, ceasing the provision of food, water supply and nesting sites previously have been proven to significantly decrease the populations of pigeons from urban areas (Geis, 1976, see Silveira, 2008). These, along with other direct measures, such as specific chemosterilization, may result in good outcomes without the need for brutal methods of extermination.

The present study showed that the perception of local people regarding the nuisances caused by pigeons *Columba livia* changed during a short-term (six years) interval between two different interview instances. Further studies should evaluate historical data and interview older people deliberately seeking to find patterns of shifting baselines within these important ecological attributes.

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