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Control hunting of wild animals: health, money, or pleasure?

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Abstract:	<p>In many parts of the world millions of game species are hunted for sport, food, skins and other products. In recent years, a backlash by certain groups of society against this long-standing human activity, has emerged. However, attitudes towards the control of wild animals to minimize health risk to other animals, to reduce agricultural damage or protect game species may generate a different response where even killing is deemed tolerable. In this paper, we analyze the public's acceptance of control hunting in Andalusia (southern Spain). Our results suggest that control to improve animal health is highly accepted but it is more controversial when animals are killed for damaging crops, and highly unaccepted when the goal is to enhance numbers of game species. Older people and males, are more prone to accept some of these control hunting measures.</p>	

Title: Control hunting of wild animals: health, money, or pleasure?**Authors: Fernando E. Garrido¹, Francisca Castro², Rafael Villafuerte^{1*}**

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Abstract

In many parts of the world millions of game species are hunted for sport, food, skins and other products. In recent years, a backlash by certain groups of society against this long-standing human activity, has emerged. However, attitudes towards the control of wild animals to minimize health risk to other animals, to reduce agricultural damage or protect game species may generate a different response where even killing is deemed tolerable. In this paper, we analyze the public's acceptance of control hunting in Andalusia (southern Spain). Our results suggest that control to improve animal health is highly accepted but it is more controversial when animals are killed for damaging crops, and highly unaccepted when the goal is to enhance numbers of game species. Older people and males, are more prone to accept some of these control hunting measures.

Keywords: Animal welfare; damage to agriculture; game species; lethal control; public attitudes; wildlife diseases.

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Introduction

1
2 Hunting, the practice of pursuing animals to capture or kill them for food,
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4 recreation, or trade of their products, has been practiced by humans for millennia. As
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6 hunter-gatherers, humans may have competed for prey with large predators (Graham et
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8 al. 2005), resulting in the deliberate targeting of these by humans (Shipman 2015).
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10 Subsequently, the transition to agriculture created greater motives for the control of wild
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12 animals, as well as the hunting for animal protein (Lee 2017). The lethal control of
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14 native wildlife has been and is still practiced in many countries often aimed at the
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16 reduction of direct (e.g. predation) or indirect (e.g. disease) impacts of wild animals on
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18 domestic livestock, on agriculture, or to protect game species. Growing knowledge and
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20 concern that wild animals may be reservoirs of zoonotic diseases has also led to the
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22 intensification of lethal wild animal control (Gortázar et al. 2007). **In Spain, the control**
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24 **of problem animals has been undertaken even at national campaign levels**, the latter
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26 being a feature of government-sponsored vermin extinction programmes of the 1950's
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28 (Villafuerte et al. 1998).
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36 In many parts of the world, recreational hunting of legally-listed game species is
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38 still widespread. **Since often many problem animals are indeed game species, hunting**
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40 **pressure on these can indirectly reduce their impacts** (Rios-Saldaña et al. 2013).
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43 However, the animal rights lobby has intensified since the mid 1970's, especially
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45 against recreational hunting (Nurse 2013). As a consequence, the growing and voluble
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47 opposition to hunting by certain sectors of society highlights the need for more
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49 measured debates and knowledge of people's perceptions of legitimate and illegitimate
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51 killing, as well as the role of cultural traditions (i.e. Pardo and Prato 2005).
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2 In this study, we analyze public attitudes to control hunting in Andalusia,
3 southern Spain. This was part of a larger project investigating people's attitudes towards
4 wildlife, hunting and conservation management in the region.
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10 **Material and Methods**

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12 We interviewed a total of 750 adults (>18 yrs.) selected from persons among the
13 3,400 participants in the Social Research Panel of Andalusia (PACIS, www.pacis.es).
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15 PACIS is constituted by a group of households that have been selected at random to
16 represent the Andalusian population. The members of these households are contacted
17 periodically to respond to a questionnaire on different topics of interest to Andalusia
18 and Andalusians.
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26 For our study, we selected PACIS subjects in a stratified manner by age and sex
27 groups. The survey was answered on-line and by telephone interview for those
28 individuals without internet access. Interviews were administered between May and
29 June 2017. The maximum sampling error was $\pm 3.6\%$ ($p = q = 0.5$).
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36 The entire questionnaire consisted of a total of 40 questions, including
37 sociodemographic characteristics of respondents. We specifically asked respondents
38 their degree of agreement with regards to controlling wild animals when they: (1)
39 present a damage to agriculture; (2) may transmit diseases to other animal species and
40 (3) affect other species of recreational hunting interest. Respondents were asked to
41 select their level of agreement by using a seven-point rating scale ranging from
42 completely disagree (=1), to completely agree (=7). At the start of the questionnaire we
43 provided the respondent with information on the aims of the study and definitions such
44 as what constituted a wild animal.
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1 For data analysis, we classified respondents into one of four age groups (18-29;
2 30-44; 45-59; >60 years), and according to their current area of residence divided into
3 rural (countryside and towns <10,000 inhabitants) or urban (towns > 10,000 inhabitants)
4 according to MARM (2009). To adjust for sex, age, and area of residence data were
5 weighted by the raking method (Valliant et al. 2013).
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11 To test the influence of socio-demographic variables (age, sex, and area of
12 residence) on the level of agreement with statements regarding attitudes to control
13 hunting of native species we employed IBM SPSS® (v 24.0) PLUM procedure
14 (polytomous universal model; Norušis 2005). This is an extension of the generalized
15 linear model for ordinal responses which, by applying backward regression analysis,
16 allowed us to determine the simplest significant models (if any), and the categories of
17 the final variables that were affecting to each one of the considered statements.
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31 **Results and Discussion**

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34 **Most interviewees agreed with the use of hunting to control wild animals if they**
35 **presented health problems for other animals (75.1%), or if they damaged agriculture**
36 **(59.2%; Fig 1.).** However, a significantly lower proportion (22.1%) agreed with the use
37 of hunting to control animals that may **negatively affect the game species** (Fig. 1).
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44 Interestingly, more than half of the respondents (53.8%) selected categories "completely
45 agree" or "mostly agree" when referring to the control for health purposes, while this
46 proportion was only 29.6% in relation to hunting to avoid agricultural damage (Fig. 1).
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51 Conversely, out of the seven possible answers, "completely disagree" was the most
52 selected when people were asked for their opinion with regards to control hunting to
53 enhance game species (33.3%; Fig. 1).
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1 According to our study, opinions given by the people consulted with regards to
2 the acceptance of the different reasons for control hunting contrasts with the frequency
3 of use of each one of these in reality. Thus, in spite of the growing importance of
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5 of use of each one of these in reality. Thus, in spite of the growing importance of
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7 controlling wild animals for prevent diseases from wildlife animals (Gortázar et al.
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9 2007), its use is still insignificant. However, hunting control to minimize damages to
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11 agriculture or to enhance game species populations are most commonly carried out. As
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13 an example, in 2005 hunting control of the European rabbit (*Oryctolagus cuniculus*) to
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15 minimize damage to cereal crops, vineyards or olive trees, was requested by 1,938
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17 (51%) of game estates (Rios-Saldaña et al. 2013). Similarly, predator control is highly
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19 widespread in southern and central Spain as shown by Delibes-Mateos et al. (2013)
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21 where approximately 90% of the hunting estates employ such management to enhance
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23 rabbits and red-legged partridge (*Alectoris rufa*) populations.
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29 **Our results indicate that for Andalusian people, wild animal welfare concerns**
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31 **outstrip economic reasons for control hunting**, with especially little acceptance for
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33 hunting for recreational reasons. **This attitude probably will grow in the future since,**
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35 **although Spanish public opinion on issues of animal welfare is one of lowest among the**
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37 **EU, there is a strong feeling among citizens that further improvements on matters to do**
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39 **with animal welfare matter are necessary (Eurobarometer 2016).**
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44 We show that there are several demographic variables that were significantly
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46 associated with responses to some statements on control hunting (Table 1). For
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48 example, men and older people, particularly those in the 45–59 age group, were more
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50 likely to agree with control hunting to prevent health problems of animals. **A very**
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52 **similar result was found in Scotland in relation to control of non-native species for**
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54 **economic reasons, and to protect native species** (Bremner and Park 2007). Only the 45-
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59 age class was significantly less critical when asked about the control of wild species that may affect game species.

Traditionally, it has been shown that males have a more positive attitude towards hunting than females, while females are tended to stand more often against cruel and exploitative treatment of animals (Kellert and Berry 1987). However, in our case, gender did not significantly influence attitudes towards control hunting to enhance game species populations. Other recent studies have also shown that gender has little explanatory power contrary to what expected (Gamborg and Jensen 2017).

The area covered by farmed areas in Andalusian region represents ~ 60% of its total surface, where historically the primary sector, and especially agriculture, has been the most important activity for the people living even in large towns (Moyano and Garrido, 2002). In this situation, avoiding damage to agriculture is not affected by age, gender, or area of residence (Table 1). Moreover, this particularity may also explain the lack of significant influence of the area of residence on the rest of statements. Other studies analyzing attitudes towards animals between urban and rural residents have shown a wide spectrum of differences (Bremner and Park 2007; Dandy et al. 2012; Gamborg and Jensen 2017), indicating that this aspect requires deeper analysis.

We have shown that the acceptance to kill an animal is highest when the reason is to improve other animals' health. However, even in an agricultural-based economy, damages to agriculture is unacceptable to a substantial part of Andalusian society. Finally, controlling animals to benefit game species is in general unacceptable, perhaps showing a high and negative perception towards recreational hunting, an activity that is showing a steady decline in Spain (Herruzo and Martínez-Jauregui 2013).

From our study, we suggest that sociological studies are useful to give conservation managers a better understanding of public attitudes on which they can base

1 management decisions, education programs and publicity when hunting control may be
2 required.
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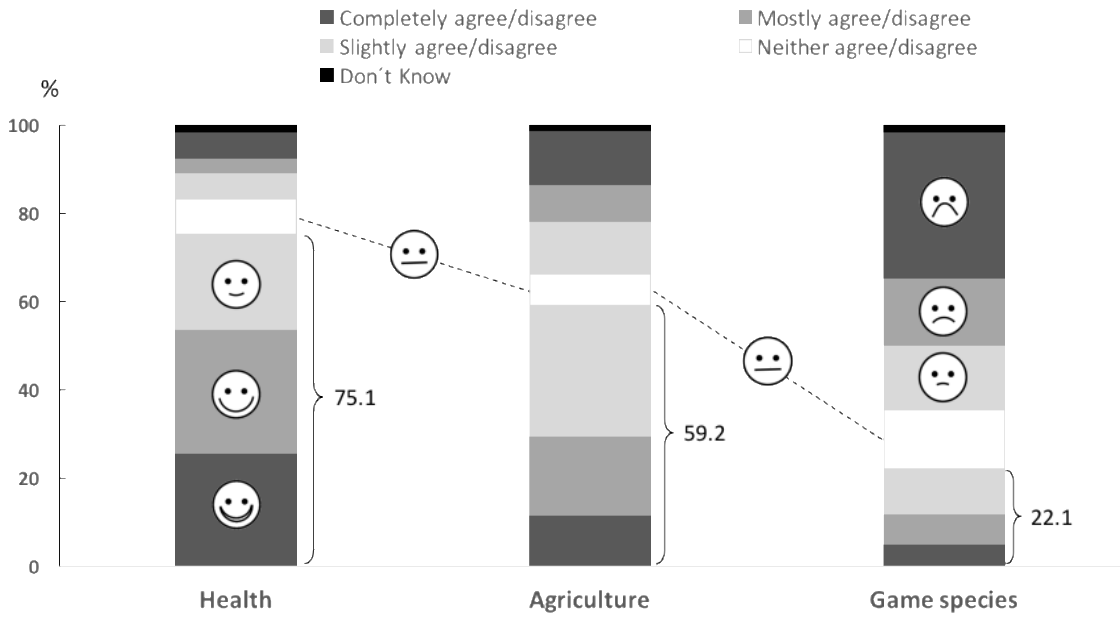


Figure 1. - Proportion of agreement with each one of the three statements considered

(see text for further details).

Table 1 – Coefficients and P-values associated with significant socio-demographic variables derived from backwards ordinal regression tests of attitudes to particular statements on hunting control.

Significant at the 5% level		Coefficient	SE	Wald	d.f.	Sig. (P)
Control hunting when wild animals transmit diseases to other animals						
(X ² = 12.008, d.f.= 4; P= 0.017)						
Age (years)	30-44	0.343	0.198	3.003	1	0.083
	45-59	0.548	0.202	7.353	1	0.007
	>60	0.394	0.202	3.799	1	0.051
Gender	Female	-0.280	0.131	4.531	1	0.033
Control hunting when wild animals damage agriculture						
(n.s.)						
Control hunting when wild animals affect game species						
(X ² = 9.766, d.f.= 3; P= 0.021)						
Age (years)	45-59	0.543	0.180	9.113	1	0.003

Reference categories: male, <30 yr