Fairness Judgments About Animals

Romain Espinosa[1] and Nicolas Treich[2]

[1]CIRED, CNRS, Nogent-sur-Marne, France
[2]Toulouse School of Economics, INRAE, France

February 11, 2025

Abstract

In this paper, we empirically investigate fairness judgments about animals. We design a survey that addresses major challenges associated with the inclusion of animal welfare in public decisions. Collecting data from a representative sample of the French population (N=1,526), we document the views of citizens on the issue. Key findings reveal strong support for directly valuing animal welfare in public decisions, with a significant support for an at least equal consideration relative to human welfare. Most people deem that policy making should take into account both animal welfare and humans' altruistic concerns about it. The vast majority supports equal consideration across different animal species (cow vs. chicken) and contexts (captive vs. wild animals). Importantly, the observed associations of fairness judgments are not consistent with the repugnant conclusion or procreation asymmetry at the aggregate level, two important concepts in population ethics. The strong support for the direct valuation of animal welfare conflicts with the dominant anthropocentric frameworks used in policy evaluations. We investigate social heterogeneity in fairness judgments with multiverse analyses ($>$ 97,000 specifications). Our results stress the importance of developing sentientist economic frameworks for more informed and ethical policymaking.

Keywords: Animal welfare, empirical social choice, moral weight, utilitarianism, life worth living, population ethics.
JEL classification: D71, Q18, I31.

The authors thank the editors and one anonymous reviewer for useful comments. Romain Espinosa acknowledges financial support from the ANR under grant ANR-19-CE21-0005-01. Nicolas Treich acknowledges research fundings from the ANR under grant ANR-17-EURE-0010 (Investissements d'Avenir program) and ANR-24-CE26-2813-02 (SentientBCA) as well as from the FDIR chair at TSE-Partnership. Corresponding author: Romain Espinosa (romain.espinosa@cnrs.fr).

1 Introduction

Animal welfare has become a major societal concern over the past decades in Western countries. For instance, 91% of EU citizens consider it important to protect the welfare of farmed animals and 84% demand better protection (Eurobarometer, 2023). Yet, paradoxically, overall animal welfare might never have been in worse state than in today's world. Indeed, the number of animals killed for human consumption has increased rapidly in the past half century, reaching about 80 billion terrestrial animals (FAO) and 1,600 billion wild aquatic animals (Mood and Brooke, 2024) yearly in the 2020s. This trend has not only had an effect on the number of animals affected by human actions but also the quality of their lives. Most of the farmed animals worldwide are indeed reared in intensive farming systems (Robinson et al., 2011) associated with significant welfare impairments (e.g., EFSA et al. (2022, 2023a,b,c)). In addition, the worsening of animal welfare is not limited to animals kept in captivity. The rapid decline of wild animals (e.g., decrease of 73% of the population size of monitored birds, mammals, amphibians, fish and reptiles between 1970 and 2020 reported by WWF (2024)) results from an unprecedented degradation of ecosystems inducing significant animal suffering.

The growing gap between the current state of animal welfare and citizens' views on the topic calls for public intervention. Recently, an emerging body of research in economics has worked on how to include animal welfare in public decisions (Johansson-Stenman, 2018; Espinosa and Treich, 2024c). Animals' capacity to experience welfare (i.e., sentience) has led scholars to think about the most effective way to improve their welfare (Ng, 1995). However, this requires to rethink standard evaluation frameworks and develop multispecies evaluation models that account for various population sizes and welfare levels (Blackorby and Donaldson, 1992; Espinosa and Treich, 2021; Zuber et al., 2024). Progress has also been made on the practical side to allow inter-species welfare comparisons (Budolfson and Spears, 2019; Fischer, 2023) and to produce monetized animal welfare scores (Espinosa, 2024) for benefit-cost analyses (Budolfson et al., 2024). Ultimately, the valuation of animal welfare could lead to a better quantification of the welfare externalities imposed on animals, especially in the food system (Kuruc and McFadden, 2023), opening the path to more informed public policies such as taxation (Espinosa and Treich, 2024b) and solving coordination problems (Espinosa and Treich, 2024a).

While economics is developing tools to include animal welfare in public decisions, a major normative choice concerns the *importance* or the *weight* that should be given to animal welfare in the determination and evaluation of public intervention. Decision making deals with diverging interests, which necessitates clear rules about how to arbitrate the associated trade-offs. These rules, which are usually embedded into social-welfare functions, are by nature the result of normative choices. While philosophy, especially utilitarianism in economics, provides thoughtful insight for the determination of these rules, it is also informative to inquire about the population's views on the matter.

Our research objective is to examine citizens's fairness judgments about animals in public decisions. We follow here the pioneer work of Johansson-Stenman (2018) which is, to our knowledge,

the first and only empirical paper in economics on the topic. In doing so, we address two significant gaps in the literature. First, we introduce animals into the empirical social choice literature (Gaertner and Schokkaert, 2012). Second, we contribute to the animal ethics literature, which has been theoretical, not empirical (Persson and Shaw, 2015).

We examine the fairness judgments of citizens about animal welfare through an online questionnaire administrated to a representative sample of the French population (N=1,526). Our survey consists of eight questions that cover several of the most salient normative questions in animal welfare economics. We start by assessing French citizens' views about the consideration of animal welfare in public decision as well as other citizens' fairness concerns for animals. We explore the variations of fairness judgments across species (i.e., chicken vs. cow), across contexts (i.e., captive vs. wild animals), and in case of inequalities (i.e., redistribution among unequal individuals). Importantly, we also analyze people's views on two of the most salient issues in animal population ethics (i.e., repugnant conclusion, procreation asymmetry). For each of these dimensions, we investigate whether the fairness judgments are specific to some socio-demographic groups. We do so by conducting multiverse analyses on standard socio-demographic attributes.

Our results provide important information about citizens' views on how to effectively consider animal welfare in public policy. We show that 93% of French citizens support some form of direct inclusion of animal suffering, and most of the surveyed individuals demand at least equal consideration of human and animal interests, which is similar to the results of Johansson-Stenman (2018) for Sweden. Conditional on taking animal welfare into account, the vast majority of respondents (82.8%) further support the inclusion of humans' altruistic concerns for animals in public decisions, which supports some form of double-counting usually criticized in economics. Regarding fairness judgments, we find that the large majority citizens support equal consideration of equal interests across species (88.2%) and across contexts (79.6%). Interestingly, we do not detect strong preferences for redistribution when animals experience unequal welfare situations: about half of our respondents find an inequality-reducing (and total-welfare increasing) policy neither desirable nor undesirable (49%), while only four in ten respondents find it desirable (37.8%).

Our survey documents to which extent citizens' fairness judgments could lead to two of the most salient issues in population ethics. First, we find that only a minority of citizens (23.5%) adhere to a set of principles that would lead to the repugnant conclusion (i.e., a situation in which one would prefer a society with a large number of individuals with lives barely worth living over a less numerous society with higher average welfare). This result is driven by two factors: the low level of inequality aversion when it comes to animals, and the limited support for the idea that the birth of an animal with positive but below-average welfare is socially desirable (i.e., only 1 in 2 participants have views aligning with the mere addition principle). Second, we also see limited support for a set of views that would induce procreation asymmetry (i.e., a larger support to avoid the creation of lives with negative welfare than to actively create lives made of positive welfare of similar magnitude in absolute terms). This result is due to a symmetry in the aggregate support for the creation of positive lives (81.3%) and the aggregate support for the avoidance of negative lives (77.4%) of similar welfare magnitude.

Last, we explore whether the heterogeneity in the fairness judgments expressed by the respondents originates from distinct normative frameworks. In other words, we analyze whether answers across different questions correlate in specific and systematic manners. To do so, we run a cluster analysis, which identifies two main groups of respondents, who disagree mainly on three questions related to life creation. Respondents in the first group (80.5% of the sample) think that it is socially desirable to bring into existence an animal with very good living conditions and to avoid the creation of an animal life with very poor living conditions. They also tend to support the view that creating a life with net positive welfare, even small, is desirable. On the contrary, respondents in the second group oppose the view that it is socially desirable to bring into existence an animal with very good living conditions and to avoid creating the negative-equivalent life. They are also less likely to say that it is socially desirable to create a life with net but small positive welfare.

The outline is as follows. First, we propose a simple theoretical background (Section 2), followed by a description of the questionnaire and our design strategy (Section 3). We then discuss the results, starting with those concerning judgments between humans and animals, and then among animals, before addressing issues related to animal population ethics (Section 4). We conclude with a short summary and discussion of our findings (Section 5).

2 Theoretical background

We start by outlining a possible theoretical framework for this study. As mentioned above, our aim is to elicit citizens' fairness views related to the general question of considering animal interests in public decision. In economics, this normative exercise can be viewed as a reflection on the properties of a multispecies social welfare function (SWF). To structure the discussion and interpretation of the results, we first introduce a formal expression for a SWF and then describe the mapping between specific parameters or functional forms used in this expression and the questions in the survey. Please note, however, that this theoretical discussion is highly simplistic and tentative, and solely serves to illustrate the main intuitions of the underlying concepts we seek to discuss. Currently, there is no broadly accepted theory for multispecies SWF. Relevant studies have only recently begun to appear (Fleurbaey and Leppanen, 2021; Zuber et al., 2024; Espinosa, 2024; Espinosa and Treich, 2024c,b). Therefore, this section should be viewed as a possible guide for interpreting the survey study, rather than a commitment to a specific formal representation that motivates it. It can be skipped without affecting the overall value and interest of the study.

We borrow from Budolfson et al. (2024) and propose to consider the following formula for our multispecies social welfare function:

$$\text{SWF} = \sum_{i=1}^{N_h} g_h(u_{hi}) + \sum_{s=1}^{S} \sum_{j=1}^{N_s} a_s \beta_{sj} g_s(\phi_s u_{sj}) \tag{1}$$

where:

- N_h is the number of humans, N_s is the number of animals in species s where S is the total number of species;
- u_{sj} is the "standardized" utility of animal j in species s, in which $\phi_s \geq 0$ is the "utility potential" of species s (Budolson and Spears 2020, Espinosa 2024) that permit utility comparisons across species;
- u_{hi} is the utility of a human individual i, which can take the following form: $u_{hi} = v_{hi} + \sum_{s=1}^{S} \sum_{j=1}^{N_s} \alpha_{isj} u_{sj}$; where α_{isj} reflects i's altruism toward any specific animal j within species s, and v_{hi} corresponds to human i's material utility;
- a_s is the "moral weight" associated with species s (Johansson-Stenman, 2018; Espinosa and Treich, 2021), and β_{sj} is the additional or reduced weight given to a specific animal sj;
- g_h and g_s are the respective transformation functions of the utilities of humans and animals that can possibly vary between species (with $g_h(u) = g_s(u) = u$ being total utilitarianism, $g_h(u) = u - c_h$ and $g_s(u) = u - c_s$ being species-specific critical-level utilitarianism and $g_h(u) = g_s(u) = g(u)$ with $g(.)$ increasing and concave being prioritarianism (see Zuber et al. (2024)).

Before discussing the mapping between the survey and Equation 1 (see Section 3.2), we want to stress two important remarks. First, note that we take the summation over species s in the SWF. There is some arbitrariness in this choice: the summation could have been made over other levels of biological taxonomy, such as orders or classes, or even directly over all individuals. While the summation over species may seem redundant, we use it because species is widely regarded as a critically important level in biological taxonomy and is often considered the fundamental unit of classification. More importantly, we interpret a species as a representative group of animals that are sufficiently homogeneous, particularly in terms of their welfare capacities. This assumption is essential for our approach, as it implies that animals within the same species are perceived by participants as being roughly similar. This forms an important underlying assumption in the survey.

Second, note that the moral weight a_s and the utility potential ϕ_s of species s are both scaling parameters defined at the species level and thus play a similar mathematical role. However, their interpretation is different. The moral weight is a normative parameter that defines how much individual utilities of a given species must be weighted in the social objective. In other words, it is a political or moral choice as to how much importance one wants to give to the same change in the welfare of animals of different species. Importantly, we also need a way to compare utilities between animals of different species, notably to define what a similar change in welfare across species is. This is the purpose of the utility potentials, which aim to account for the differences in welfare capacities across species.

To illustrate the conceptual difference between the two parameters, suppose that u_{sj} represents a "standardized" utility computed in the same range for all species, say the 0-1 range (Budolfson et al., 2024). Then a level of standardized utility of 0.4 for a chicken may not be the same as 0.4 for

a pig. This might be due to the fact that one considers pigs to be capable of more intense welfare experiences than chickens. The utility potential parameter ϕ_s captures this difference and allows one to weight these standardized utility levels across different species such as to obtain comparable utility points (aka utils). In this paper, we focus on the moral weight, not on the utility potential.[1] See, e.g., Fischer (2023), Espinosa (2024) and Espinosa and Treich (2024b) for a discussion about how to calibrate the utility potential.[2]

3 Survey

3.1 Design

The survey consists of three main blocks. First, we ask participants eight questions displayed on successive screens. Second, participants face a discrete choice experiment related to transportation, unrelated to the current manuscript. Last, we ask participants a series of sociodemographic questions and some attention checks. The instructions are displayed in the Supplementary Materials. This work received the approval of the ethics committee of the *Centre International de Recherche en Environnement et Développement* (IRB approval number: IRB-CIRED-2023-1).

Our first question (Q1) seeks to elicit people's views on whether society should consider animal suffering in public decisions. For comparability purposes, we replicate the original question of Johansson-Stenman (2018). More precisely, we ask participants to what extent animal suffering should be taken into account in public decision making relative to human suffering for equal amounts of suffering. Participants can choose among increasing levels of consideration of animal suffering: (i) no consideration at all; (ii) no consideration of animal suffering per se, but consideration of the well-being of humans who suffer from having animals suffering; or direct consideration of animal suffering but (iii) at a much smaller extent, (iv) at a somehow smaller extent, (v) to an equal extent, or (vi) to a greater extent than human suffering.

Second, we examine the situation in which animal welfare is directly considered in public decisions. Given the direct consideration of animal suffering, we ask participants whether public decisions should also take into account the welfare of humans who suffer from the suffering of animals (i.e., indirect consideration). In our question (Q2), we present the usual main argument for and against this dual consideration. Taking both animal suffering and human altruistic suffering into account would better reflect experienced welfare in society, but would lead to valuing animal suffering

[1] This distinction between moral weights and utility potentials is central. It relates to the discussion of Browning (2023) who distinguishes the "moral" and the "empirical" issues. The moral issue is about the choice of the moral weights, i.e., how much importance one wants to give to animal welfare in public decisions. It is, by definition, a normative choice. In contrast, the empirical issue consists in comparing welfare across species and obtaining an empirically based rate of conversion. In essence, it involves making empirical assessments of the welfare levels that animals of a given species are capable of experiencing and comparing these welfare levels between individuals of different species. Note also that this observation regarding the distinction between a moral and an empirical approach could find a parallel in discussions about the calibration of intergenerational discount factors.

[2] Note for conceptual clarification that Fischer (2023) talks about the Moral Weight Project, which ultimately estimates welfare ranges. The Moral Weight Project thus yields welfare/utility potentials, and not moral weights in the sense we understand them here.

through two channels. Participants can respond either in favor or against this dual inclusion.

Third, we investigate whether people have a homogeneous view of the inclusion of animal suffering in public decisions or whether their support varies depending on the species of the animal under scrutiny. Our third question (Q3) explores the presence of such speciesist preferences by asking participants how society should weigh equal amounts of suffering in a cow and in a chicken. We selected these two animals because the cow was mentioned in the first question and the chickens are by far the most numerous farmed animals.[3] Participants can report equal consideration or greater consideration for one of the two animals each.

Fourth, we ask a question about the possibility of avoiding the conception of an animal that would have a net-negative lifetime welfare. In this question (Q4), we tell the participants that the living conditions of the hypothetical animal would be so poor that its life would not be worth living. To avoid overlapping concerns with other moral issues, we explicitly tell participants that the animal does not exist, even as a fetus, such that it is not a question of abortion. Participants are asked if they would agree with the statement that avoiding the conception of such an animal is best. Our fifth question (Q5) is somehow symmetric and asks people whether they would support the creation of an animal whose lifetime happiness would be equivalent, in positive terms, to the unhappiness of the animal of the previous question. Here, participants must report whether they agree with the statement that bringing such an animal into existence would be best.

Next, we explore another source of heterogeneity in considering animal welfare in public decisions: the nature of the relationship humans have with the animal under scrutiny. In the sixth question (Q6), we ask participants whether society should give the same level of consideration to equal amounts of suffering in an animal raised in captivity and an animal living in the wild. Here, participants can report equal or greater consideration for one of the two animals.

Last, we introduce two questions closely related to the repugnant conclusion (Parfit, 1984). The seventh question (Q7) explores the social worth of adding an animal life whose lifetime net utility would be positive but smaller than the average welfare of current animal lives. Participants must indicate whether they think the birth of such an animal would be desirable or not (or neither). In the last question (Q8), we investigate whether reducing inequalities among animals is perceived as socially desirable. We ask respondents their views on a policy that would slightly reduce the welfare of the happiest existing animal, but would increase the welfare of the least happy. We explicitly mention that the policy would slightly increase total and average happiness. Here, we seek to assess the prevalence of welfare inequality aversion when it comes to animals. Participants are asked whether they find such a policy desirable, undesirable, or neither desirable nor undesirable.

3.2 Theoretical discussion of the survey

We now discuss how the above questions can be examined and interpreted using the multispecies SWF presented in Section 2. In what follows, we use the terms moral weight and moral consideration

[3] Also, we note that previous studies have shown higher altruistic preferences for cows than for chickens (e.g., higher willingness-to-pay for measures improving cow welfare than chicken welfare; see, e.g., Clark et al. (2017))

as synonyms.

Our first question relates to the moral weight a_s included in our multispecies SWF (Equation 1). By comparing equal amounts of suffering, the question aims to neutralize the issue of heterogeneity in the capacity to experience welfare, i.e., the effect related to utility potentials ϕ_s, and to focus on the valuation of similar interests, i.e., the moral weights a_s. Total anthropocentrism is equivalent to not considering the welfare of animals in public decisions, i.e. $\forall s : a_s = 0$. On the contrary, antispeciesism can be understood as considering equal interests equally, i.e., $\forall s : a_s = 1$.[4] Intermediary situations (i.e., $\exists s : 0 < a_s < 1$) can be viewed as "partial speciesism". It corresponds to cases where there exists at least one species for which the interests of the animals are considered in public decisions (leaving total anthropocentrism), but to a smaller extent than equivalent interests in humans (not reaching antispeciesism). This intermediate situation is related to what Kagan (2019) calls the "hierarchical approach", where animals count but to a lesser extent than humans.

Our second question explores the issue of double counting of animal welfare in public decisions. Conditionally on directly valuing animal welfare in the SWF (i.e., $a_s > 0$), we investigate whether human altruistic preferences toward animal welfare should also be included in the social welfare function. Formally, conditionally on $a_s > 0$, should we consider the entire welfare experienced by humans (i.e., considering u_{hi} in the SWF, with possibly $\alpha_{isj} > 0$ for some s) or should we consider a truncated part of their utility, i.e., their welfare net of the altruistic preferences (i.e., using only v_{hi} in the SWF).

The next question (Q3), which compares the consideration given to equal amounts of suffering in a cow and a chicken, investigates the heterogeneity in the moral weights a_s. In the SWF presented in Section 2, it is equivalent to testing whether $a_s = a_{s'}$ for $s \neq s'$ in people's views. Here, we focus on one comparison, i.e., whether $a_{\text{cow}} = a_{\text{chicken}}$. Note that, here as well, the question is not about whether humans have different altruistic preferences for animals of their distinct species, which relates to α_{cow} and α_{chicken}, but whether society should weigh equal interests for cows and chickens equally.

Relatedly, question Q6 explores another source of heterogeneity in the weight given to an animal's interests. In our SWF (Equation 1), we allow society to weigh (similar) interests of animals of the same species differently. The potential difference in consideration within a species is captured by the parameters β_{sj}, and the difference is effective when there are at least two animals j and j' of the same species s such that $\beta_{sj} = \beta_{sj'}$.[5] We acknowledge that the introduction of the normative parameters β_{sj} is not standard. In a welfarist approach to social choices, it is unclear why two animals of the same species should have different weights in the social objective. This, for instance,

[4] Peter Singer, in his influential book Animal Liberation (1975), popularized the term "speciesism", comparing it to racism by highlighting how both phenomena involve prioritizing the interests of one's own group over those of another. Central to Singer's antispeciesism argument is the principle of "equal consideration of interests", which mandates giving equal moral weight to similar interests of all affected by our actions. The notion of "interests" is captured by utilities in our economic interpretation of the notion of antispeciesism (see Equation 1). We consider that a social planner who assigns the same weight to one utility point unconditionally on the species of the animal that experiences this utility point is antispeciesist.

[5] Note, again, that β_{sj} is different conceptually from α_{isj}. The latter captures the altruism of humans toward specific animals.

would violate (within-species) anonymity axioms. At the same time, we recognize that people might consider that some specific aspects related to the living conditions or status of the animal matter for social welfare. Here, we explore the possibility of assigning different moral weights based on the type of relationship society has with the animal under scrutiny, i.e., whether the animal is raised in captivity or lives in the wild.

The last four questions aim to explore people's views related to standard axioms in social choice and, in particular, in the case of variable population. Question Q8 examines the desirability of inequality reduction, in the spirit of a Pigou-Dalton transfer. It is related to the concavity of the transformation function $g_s(.)$ in Equation 1 (Adler, 2011). Questions Q4, Q5 and Q7 relates to the mere addition principle, the repugnant conclusion, and the asymmetric procreation principle for animals, which we explain in more detail below. Note that some parametric choices of $g_h(.)$ and $g_s(.)$ of Equation 1 can lead to respect or violate these axioms (e.g., total utilitarianism, critical-level utilitarianism or average utilitarianism (Blackorby et al., 2005; Arrhenius et al., 2022)).

3.3 Data collection

Data were collected online (Qualtrics) in July 2023. In total, 1,526 participants recruited by a private survey firm (MSI) completed the survey and passed the attention checks. The sample is representative of the French population in terms of gender (54.8%) and age category (18-29 y.o.: 17.30%, 30-44: 30.41%, 45-59: 27.85%, 60+: 24.44%). All income categories are represented (less than €1000 per month: 8.72%, €1000-2000: 32.63%, €2000-3000: 33.16%, more than €3000: 21.04%, no answer: 4.46%). The instructions and questions were displayed in French. The order of the questions was fixed.

4 Results

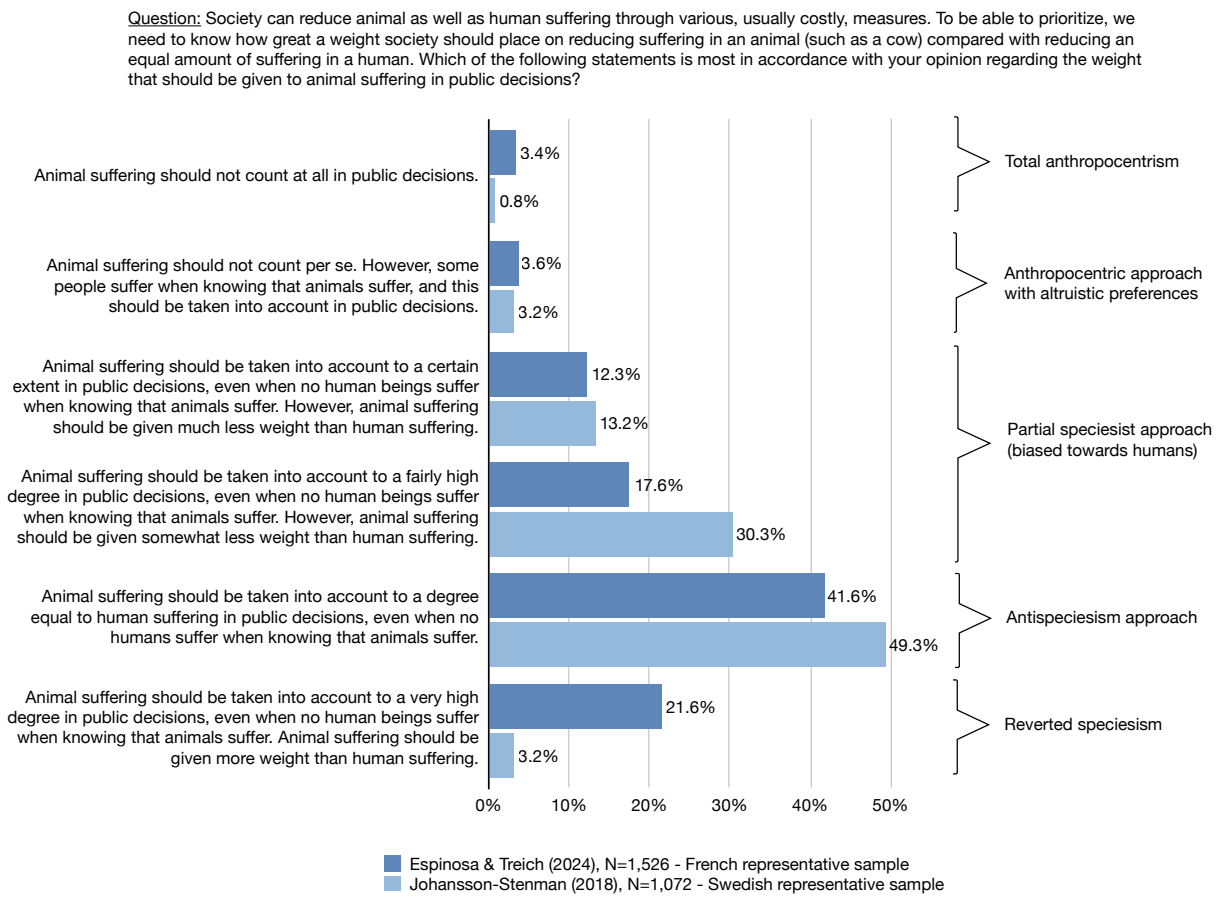
In what follows, we present the descriptive statistics of the responses of the representative sample and discuss the correlation with sociodemographic characteristics. We investigate how answers vary with gender, age, income, political orientation, dietary habits, and religiosity. To ensure that the associations we detect are not due to a particular specification choice, we run multiverse analyses (e.g., Steegen et al. (2016); Simonsohn et al. (2020); Cantone and Tomaselli (2024)). In the appendix, we detail how we proceed. In particular, we discuss alternatives for the econometric models, the control variables, and the exclusion rules. All models are corrected for heteroskedasticity. We report the results of multiverse analyses as the share of universes in which the sociodemographic variable of interest has a statistically significant relation with the outcome variable ($H_0 : \beta = 0$). We display the full results as figures in the Supplementary Materials.

4.1 Fairness judgments between humans and animals

In the first two questions, we explore people's fairness judgments regarding the consideration of animals' interests in public decision-making. First, we elicit people's views about whether animal

suffering should be taken into account in public decisions. We reproduce here the original question of Johansson-Stenman (2018), who asked how much weight we should give in public decisions to reduce suffering in an animal like a cow compared to reducing an equal amount of suffering in a human. Participants can choose among various levels of consideration of the animal's suffering: (i) no consideration, (ii) some consideration only in case some humans care about it, (iii) direct consideration but to a significantly smaller extent than the suffering of the human, (iv) direct consideration but to a somewhat smaller extent, (v) equal consideration, and (iv) larger consideration.

Figure 1: Distribution of the answers to the first question of the survey about the relative weight to give to animal suffering compared to an equal amount of human suffering.



The distribution of answers is reported in Figure 1. The results of our representative sample of the French population are similar to those of Johansson-Stenman (2018). First, very few people reject all forms of consideration of animal suffering (3.4%) or believe that animal suffering should matter only to the extent it matters to humans (3.6%). In contrast, more than nine out of ten respondents in our sample (93%) support some form of direct consideration of animal suffering. In this group, most of the participants consider that equal amounts of suffering in a cow and a human should be given equal consideration. In fact, the mode of the distributions of the two samples corresponds to the answer of equal consideration (41.6% of our sample). A notable difference

between the two samples concerns the category of 'reverted speciesism': our respondents are more likely to consider that animal suffering should be given greater consideration than an equivalent amount of human suffering (21.6%) compared to the Swedish sample of Johansson-Stenman (2018) (3.2%). Such a high proportion of reverted speciesism seems implausible, raising questions about the underlying factors driving this result. This issue warrants further investigation in future research.[6] Notwithstanding this difference, the two samples show similar patterns: a large majority supports the consideration of animal suffering in public decisions, with more than half of the people supporting at least equal consideration compared to human suffering. Overall, these results appear inconsistent with a hierarchical view (Kagan, 2019) but in line with an antispeciesist view such as that promoted by Singer (1975).

The answers to this first question are significantly correlated with some sociodemographic characteristics. Our multiverse analysis of 97,200 specifications reveals three main associations (see Figure SM2.1 in Supplementary Materials 2). First, women are associated with greater consideration for animal suffering than male respondents in 81.7% of the specifications (i.e., the p-value for the coefficient associated with female is lower than 10% in 81.7% of the specifications that evaluate an association between women and the answers to the first question). Second, in 89.3% of our specifications, participants with a greater consumption of animal products give significantly lower weight to the suffering of the animals in public decisions. Third, we also detect a significant association with income. Compared to the reference income group ('between 1000 and 2000 EUR' per month), wealthier individuals are less likely to support the consideration of animal suffering. The effect is statistically significant in 68.6% of the specifications for individuals earning between 2000 and 3000 euros per month and in 95.2% of the specifications for those earning more than 3000 euros per month. This suggests some monotonic association with income. We do not observe any clear pattern beyond the gender and income effects and the association with dietary choices. We cannot exclude the fact that religious people have different views on the topic, but our study might be underpowered to detect such an association.

In the second question, we explore a related issue, namely whether, in case we were to directly consider animal suffering in public decisions, we should still take into account humans' altruistic feelings for the animals (indirect approach). As the results of the first question above showed, there exists a large consensus to *directly* value animal welfare. However, if we were to do it, it is not trivial whether we should also value humans' altruistic concerns for the animals, as animal welfare could be valued through more than one channel. Our second question addresses this issue and asks whether the suffering of the animal, should it be valued directly, should also be valued indirectly. Note that we also survey for this question (and subsequent questions as well) the participants who originally

[6] One possible explanation is that participants aim to express their strong concern for animal welfare by endorsing such a strong statement. Another explanation could relate to how the question is interpreted: participants may perceive animal suffering as more severe than human suffering in this world, leading them to prioritize it. Other standard behavioral factors might be at stake such as experimenter demand effect or social desirability biases. Regarding the former, we believe its prevalence is limited as this was the first question participants faced and they might not have had sufficient materials at this stage to form beliefs about the researchers' objective. Regarding the latter, standard methods such as list experiments could help delimit the potential bias in the answers.

opposed direct consideration of animal welfare in public decisions.[7] The results are displayed in Figure 2.

In our sample, more than 8 out of 10 respondents (82.8%) think that public decisions should consider both the suffering of animals (direct consideration) and the altruistic suffering of the people who care about them (indirect consideration). However, this dual valuation, also known as double counting, is not standard. In environmental economics, it is generally argued that double counting due to altruistic preferences should be avoided. Some argue that it is unclear why more public goods should be provided in societies where people are more altruistic toward each other (Diamond and Hausman, 1994). Others also underline the existence of complex effects that arise in the presence of multi-sided altruism (Bergstrom, 1999). Here, multi-sided altruism might not be as strong a concern as in the case of between-human altruistic preferences. In fact, animals typically do not care about human welfare, with the possible exception of some pets.[8]

Regarding the heterogeneity in the answers, we observe a modest number of associations with the demographics (see Figure SM2.2). We see that the wealthiest group of respondents is less likely to support dual valuation (significant negative association in 81.2% of the specifications). Last, while individuals with a greater consumption of animal-based products are more reluctant to directly value animal welfare (previous question), they do not show (greater) opposition to consider human altruistic concerns conditionally on animal welfare being already directly valued.

4.2 Fairness judgments among animals

4.2.1 Fairness judgments across species

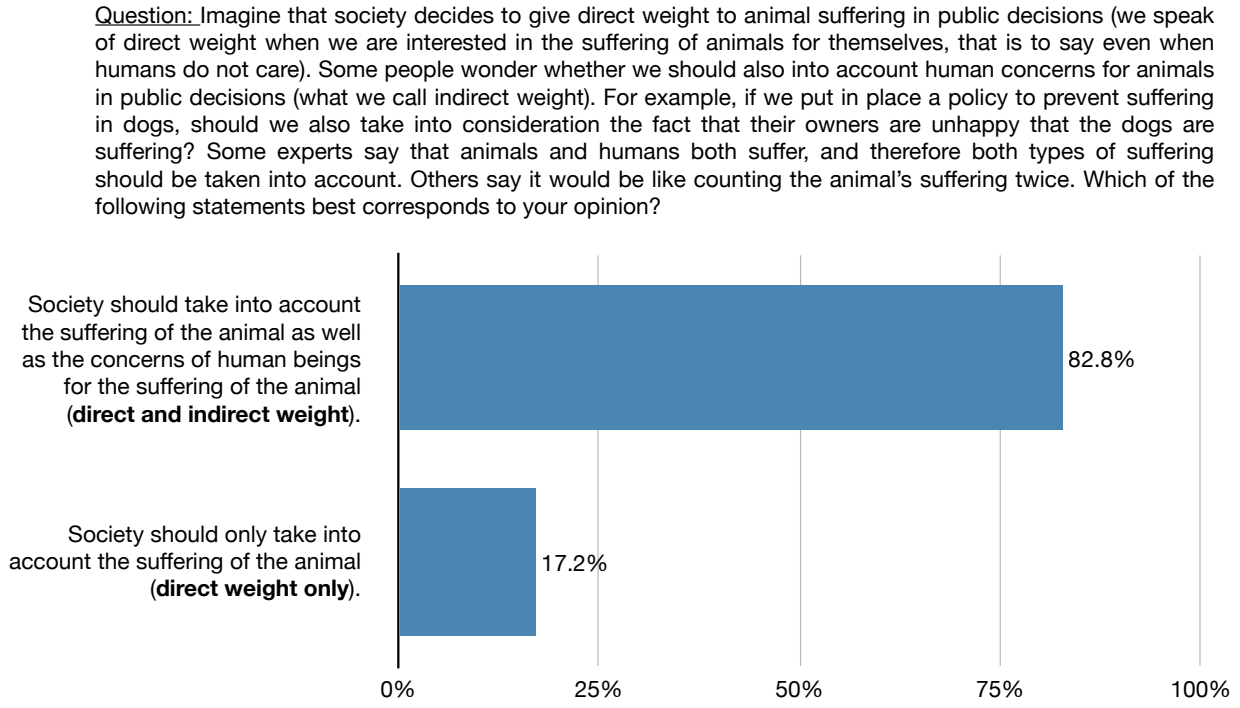
Next, we explore whether people's fairness judgments about animal welfare vary across animals and, more particularly, across animals of different species. Although people may agree that public decisions must take into account animal suffering, they might be willing to value the suffering of some animals more than the suffering of others. To explore this, we use again the concept of 'equal amount of suffering', but we now compare the suffering of a chicken with an equal amount of suffering of a cow. Question 3 asks participants if they think that both types of suffering should receive equal consideration or if the suffering of one of the two animals merits greater consideration.

The results, displayed in Figure 3, indicate a large majority support for weighing equally equivalent amounts of suffering in a cow and a chicken (88.2%). Again, this result appears inconsistent with Kagan's hierarchical view and consistent with Singer's antispeciest view (similar interests deserving equal consideration, independently of the species). Although this finding provides some evidence in

[7] One can see this as a step-by-step democratic process: Citizens first vote on whether to directly value animal welfare and, if it has been decided to do so, vote about how to do it. Note that, given the small share of individuals who oppose all forms of direct consideration of animal welfare (7% of the sample), the results to the other questions that we discuss below remain qualitatively similar.

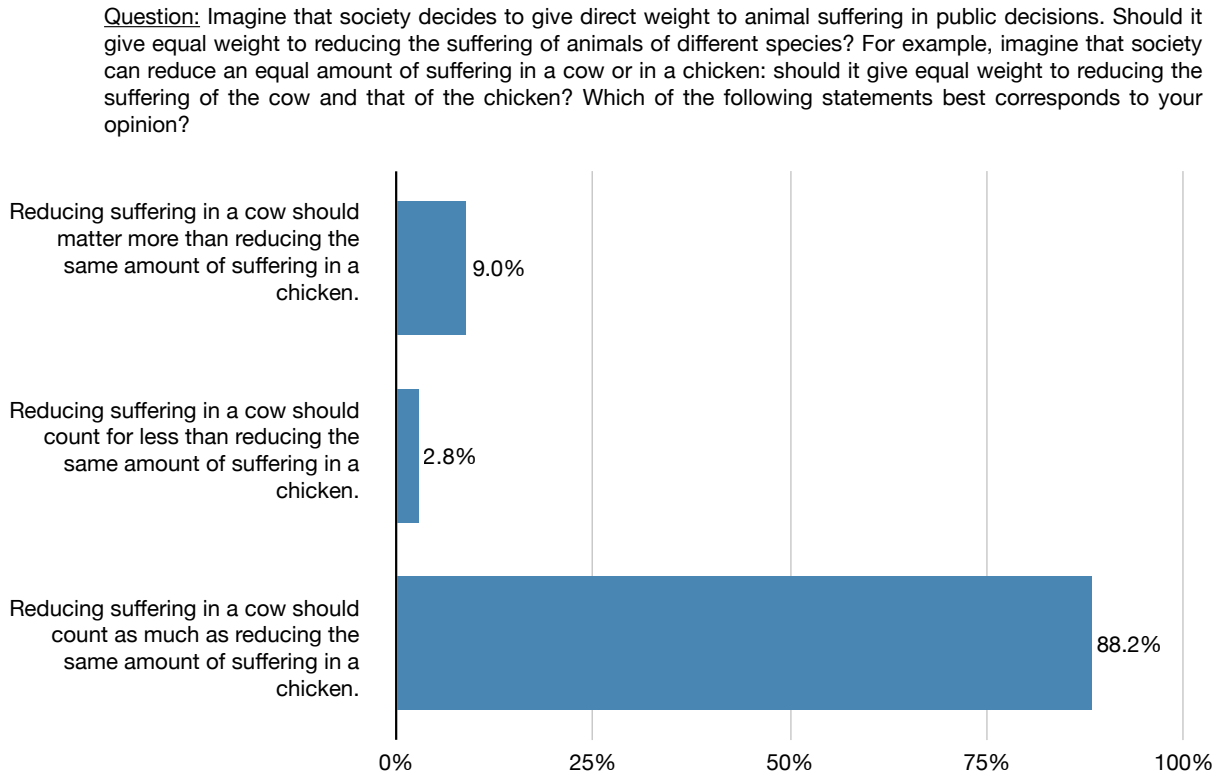
[8] However, the first argument raises an important and difficult question. On the one hand, if society cares about experienced welfare, there is no reason to exclude altruistic preferences. If people want to improve animal welfare because they care about it, this should also matter for social welfare. On the other hand, it is unclear why animals that benefit from larger altruistic concerns of humans should deserve better protection than others. When trade-offs emerge between species, some animals could be made worse off by including these altruistic preferences by giving a greater relative weight to some species or individuals.

Figure 2: Distribution of the answers to the second question of the survey about whether human altruistic concerns for the animals should also be taken into account in public decisions when animal suffering is already valued.



favor of the equal weight hypothesis, we cannot exclude that it is contingent on the two species that we selected here, i.e., cows and chickens. Among the remaining participants, we observe a slight preference for a greater consideration of the suffering of the cow in public decisions relative to the chicken's. Regarding the correlation with demographics, here we consider a multinomial model with equal consideration as the reference group (see Figure SM2.3 in the Supplementary Materials). We do not detect any clear association pattern.

Figure 3: Distribution of the answers to the third question of the survey about whether an equal amount of suffering for a chicken and for a cow should receive equal consideration in public decisions.

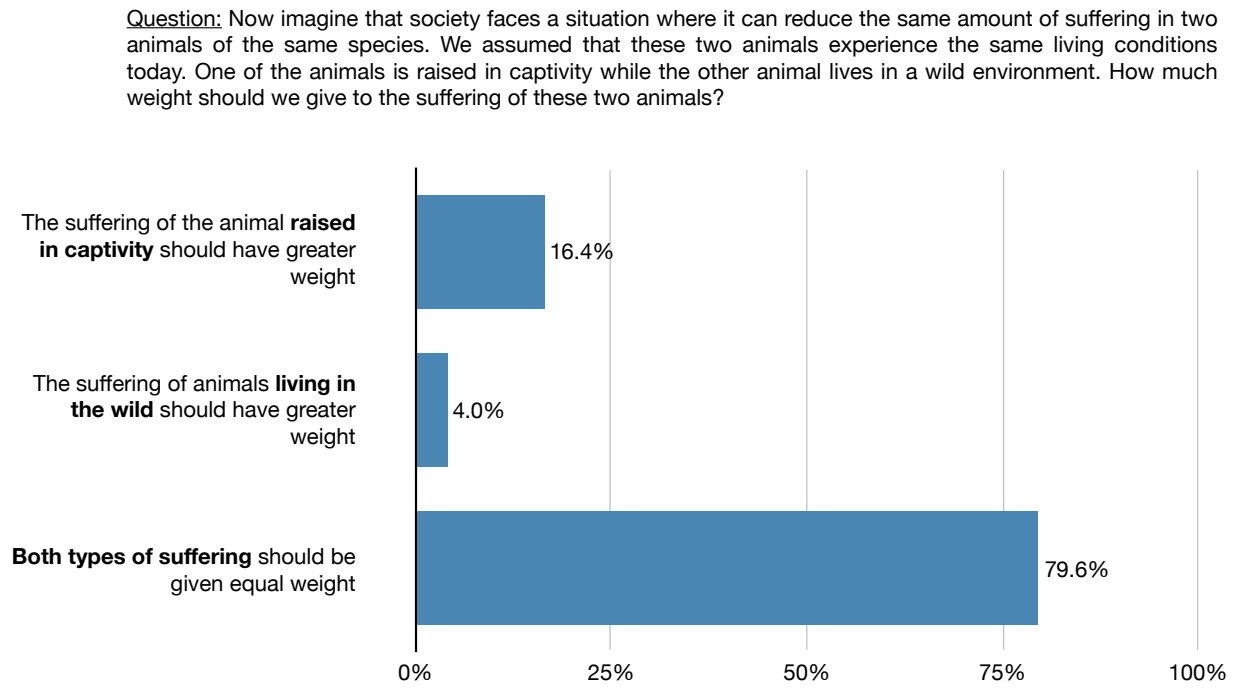


4.2.2 Fairness judgments across contexts

Fairness judgments might vary not only depending on the species of the animal at stake but also on the nature of the relationship people have with the animal. In particular, differential treatment might arise when individuals are not fully consequentialist but have some deontological preferences. With regard to animals, the literature suggests that people may feel different moral obligations towards animals in captivity from those in the wild. Some factors could lead humans to give less consideration to the welfare of farmed animals. For instance, it could be that cognitive dissonance leads us to downplay the cognitive abilities of farmed or lab animals to alleviate the guilt associated with their exploitation (Bastian et al., 2012; Vezirian et al., 2024). Alternatively, some factors could also lead people to support greater consideration of the welfare of animals in captivity, as humans feel responsible for their very existence.

Interestingly, the results of question Q6 show that most of the participants in our study (79.6%) believe that the suffering of an animal living in captivity and that of a wild animal should be taken into account equally (see Figure 4). These preferences are aligned with a utilitarian approach to animal welfare, rather than a duty-based or deontological approach. It is also consistent with an antispeciesist view, where pain is pain no matter which type of animal suffers. Among the remaining participants, we observe a larger preference to give greater consideration to the suffering of an animal

Figure 4: Distribution of the answers to the sixth question of the survey about whether an equal amount of suffering for an animal living in the wild and an animal living in captivity should receive equal consideration in public decisions.



kept in captivity (16.4%) than in the wild (4.0%). This suggests that, at the margin, people have a slight preference to consider more animals they have in charge. Regarding demographics (Figure SM2.6 in the Supplementary Materials), we do not observe any clear association, except that female and younger respondents are more likely to report equal consideration than greater consideration for the animal in captivity.

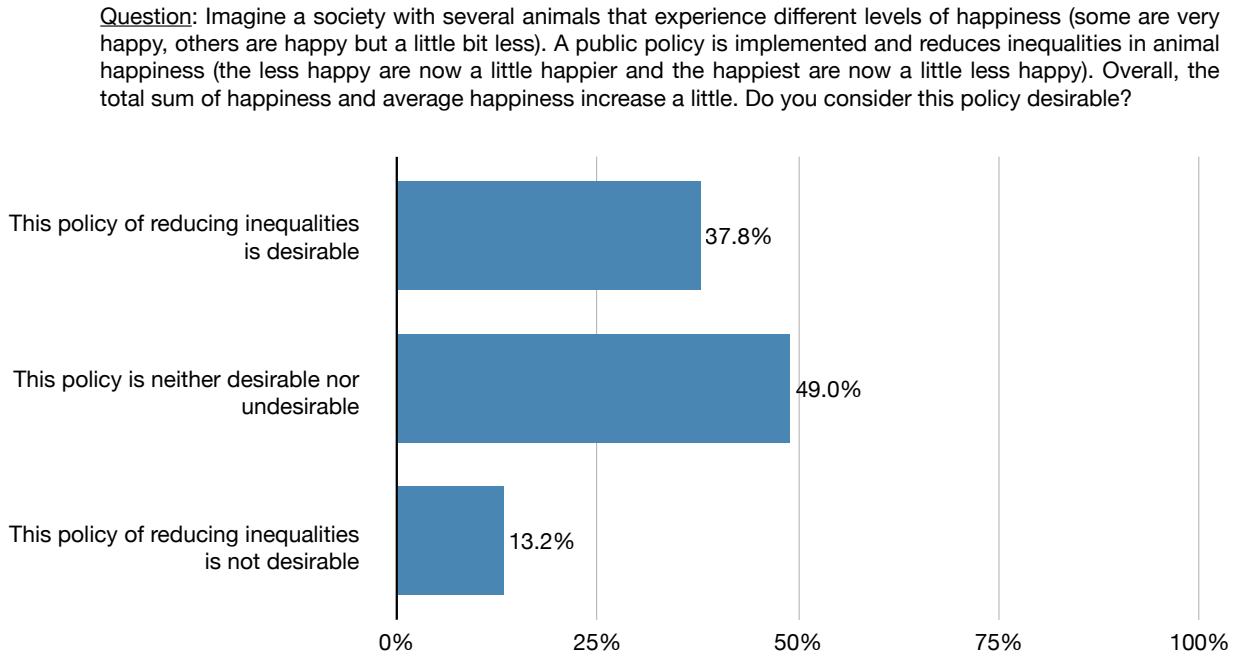
4.2.3 Fairness judgments about inequality

We now turn to the question of fairness judgments related to inequalities among animals. We explore the inequality concerns of humans when some animals face heterogeneous welfare situations. Previous works in social choice theory have addressed the question of inequality through several concepts. One of the most popular is the Pigou-Dalton transfer principle (PDTP), which considers any transfer of a given good (typically income) from wealthier to poorer individuals, provided that the original welfare ranking of individuals in society remains unchanged, as socially desirable. Quite surprisingly, some empirical studies have shown that a significant part of the population does not find such transfers socially desirable for humans (Amiel and Cowell, 1999; Gaertner and Schokkaert, 2012). Another important principle related to inequality that has attracted attention in population ethics is the non-antiegalitarianism principle (Ng, 1989), also called the weak inequality aversion principle (Arrhenius et al., 2022). The non-antiegalitarianism principle (NAP) states that any welfare transfer that increases total and average welfare while making everyone equal is socially

desirable.[9]

To limit the cognitive load of the survey, we introduce a simple policy that combines elements of the PDTP and NAP. We analyze a policy that reduces inequality and increases both total and average welfare. It does this by slightly reducing the happiness of those who are happier and increasing the happiness of those who are less happy. Question 8 elicits the support for such a policy when it comes to animals. In our sample, approximately half of the respondents (49%) consider such a policy to be neither desirable nor undesirable (see Figure 5). The second largest group of participants considers that the inequality reduction policy is socially desirable (37.8%). Last, only about one out of eight respondents (13.2%) declares this policy to be undesirable. Overall, we find a reluctance to reduce the welfare of an animal to improve the welfare of another, but there seems to be room for some acceptable transfer.

Figure 5: Distribution of the answers to Question 8 of the survey about whether a policy reducing inequality among animals is socially desirable.



The low level of support for the Pigou-Dalton principle raises important questions. Policy making requires numerous trade-offs, especially in the case of limited budget spending. Allocating public resources to help some animals might require reducing spending that has historically been used for other animals. When the situation of some animals deteriorates, it might be justified to adjust policy programs to help the animals that are the most in need. The fact that half of the participants refuse to reduce the welfare of one animal to benefit another could stem from a status quo bias or a reluctance to actively harm the welfare of any animal. Note also that participants are asked to evaluate a progressive transfer of happiness between animals. If economists are familiar

[9]Note that, assuming decreasing marginal utility, a transfer that respects the PDTP is also expected to increase total and average welfare.

with the simple abstract idea of redistributing happiness, lay people could just find it implausible. More fundamentally, people may also struggle at making interpersonal comparisons of welfare in this context. Finally, we do not detect particular patterns in terms of demographics (Supplementary Materials, Figure SM2.7).

4.3 Animal population ethics

Numerous policies affecting animals do not only affect the welfare of existing individuals but also the number of animals that exist. For example, regulating intensive farming improves the welfare of farmed animals but could reduce the number of farmed animals due to higher production costs. Alternatively, conservation policies can prevent the growth of some populations of some species to maintain some balance in local ecosystems. Hence, these policies raise a population ethics issue (Blackorby and Donaldson, 1992; Blackorby et al., 2005). It is thus central for public decisions to consider the impact of policies on animals both at the intensive and extensive margins or, in other words, the quality and quantity of lives.

In the literature on (animal) population ethics, one important challenge is to understand which lives are considered as socially desirable. In formal models, this question often revolves around whether there is a welfare threshold above which society considers that the existence of an individual with a strictly larger welfare increases social welfare. A key related concept is the idea of a life worth living (Matheny and Chan, 2005; Višak, 2013; Espinosa and Treich, 2021). In some cases, the net welfare experienced over a life could be so bad that we might consider that such a life would not be worth living. Under some social rules, we might consider that lives that are not worth living are not socially desirable. For instance, under total utilitarianism, a life not worth living, which we could model as a life with a lifetime net negative utility, would decrease social welfare. As a result, animal-based products such as meat should be subsidized if an animal's life is worth living and taxed if it is not (Espinosa and Treich, 2024b). Some other social rules might have larger welfare thresholds to consider that a life increases social welfare. For instance, critical-level utilitarianism considers that a life should not just be barely worth living (i.e., a strictly positive but small lifetime net welfare) to be socially desirable but that it should have a sufficiently high welfare level.

4.3.1 Mere addition principle and repugnant conclusion

First, we analyze the adhesion of human respondents to the idea that adding an animal life with a net-positive welfare is socially desirable. It corresponds to the mere addition principle (Arrhenius et al., 2022) and plays an important role in population ethics. Indeed, it can be shown that any theory that respects the mere addition principle and the non-antiegalitarian principle, also called

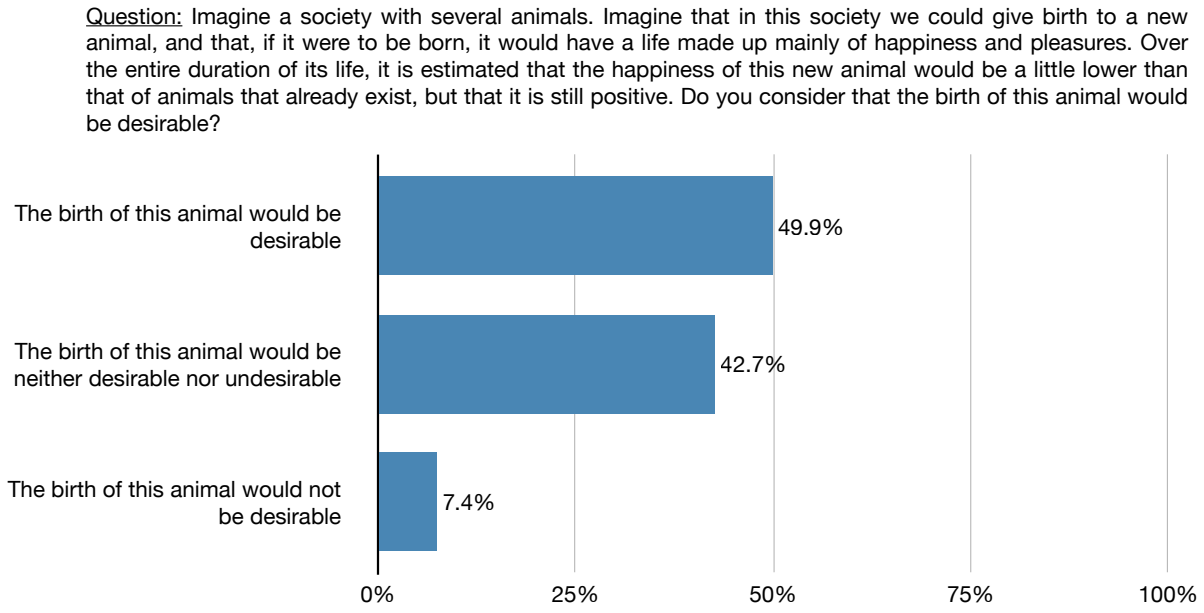
the weak inequality aversion principle, leads to the well-known repugnant conclusion (Ng, 1989).[10] The repugnant conclusion corresponds to the situation where society would prefer a (very) large population of individuals with lives barely worth living over a less numerous population of individuals with a high quality of life (Parfit, 1984). The repugnant conclusion, as its name indicates, is often considered as an undesirable implication of a social rule. However, it has been the subject of several proofs of incompatibility in the literature (Arrhenius et al., 2022), and whether this conclusion is actually repugnant has been contested (Zuber et al., 2021). In population ethics, it is well known that total utilitarianism leads to the repugnant conclusion, while critical-level utilitarianism and average utilitarianism can avoid that conclusion (Blackorby et al., 2005).

Here, our objective is to assess to which extent humans' preferences over the social contribution of an animal life and inequalities among animals could lead to a repugnant conclusion for the animals. With Question 8 above, we already discussed preferences regarding inequality reduction. In Question 7, we assess the adhesion of our participants to the mere addition principle when it comes to animals. The results displayed in Figure 6 show that most of the participants in our study believe that the birth of an animal whose welfare would be positive but below the average welfare of existing animals would be desirable (49.9%). However, about four in ten participants (42.7%) do not see this principle as desirable or undesirable.

The answers to Questions 7 and 8 together show little room for the repugnant conclusion when it comes to animals. Answers to Question 7 indicate indeed limited support for the mere addition principle: having a positive welfare might not be sufficient for people to think that bringing an animal into existence is socially desirable. Our respondents also showed minority support (37.8%) to our inequality reduction principle. In total, only 23.5% of the respondents in our sample adhere to the two principles that would jointly be consistent with the repugnant conclusion. Note, however, that the argument that the combination of the two questions leads to the repugnant conclusion assumes choice-set independence (Bruers, 2022). However, people might prefer adding slightly happy animals only in situations that do not result in a repugnant conclusion.

[10] The intuition of why the conjunction of the mere addition principle (MAP) and the non-antiegalitarian principle ultimately leads to the repugnant conclusion is as follows. First, let us consider a given Society A. The MAP implies that any Society A' that is identical to Society A but with an additional life that is barely worth living is socially preferable. Note that this reduces average welfare. Second, the NAP considers that reducing inequalities, while not decreasing total welfare, is socially desirable. Thus, any Society B that is identical to Society A' but in which we reduced inequalities is socially preferable. By transitivity, Society B is preferred to Society A: we prefer Society B which has more individuals and lower average welfare. The repugnant conclusion is achieved by iterating this reasoning.

Figure 6: Distribution of the answers to Question 7 of the survey about whether creating a life of an animal with positive but below-average welfare is socially desirable.



4.3.2 Procreation asymmetry

In the survey, we also explore another concept discussed in the literature on population ethics, namely, procreation asymmetry. This concept relates to the idea that we might feel different moral obligations when it comes to creating or avoiding creating new lives. McMahan (1981) defines the principle as follows: "while the fact that a person would have a life worth not living provides a reason not to conceive him, the fact that a person would have a life worth living does not provide a reason to conceive him". An underlying justification is that creating an individual with a bad life is ethically objectionable since that individual can complain about this decision. Conversely, refraining from creating a person with a good life may not be problematic since the non-existent individual cannot complain about the decision.

Empirically assessing the prevalence of the procreation asymmetry principle is a challenging task (see Spears (2020) for a recent attempt). Individuals might have different perceptions of the worthiness of a given life. Some may consider a life with very poor welfare worth living, while some others might consider it unworth. In the survey, we explore to which extent humans are subject to procreation asymmetry when it comes to animals. We attempt to neutralize the heterogeneity in the appreciation of a life's worthiness by considering two animals with equivalent welfare levels in absolute terms, one having a positive welfare and the other having a negative one. In Question 4 we ask whether the conception of an animal whose life would not be worth living given the very poor living conditions that it would experience if it existed should be avoided. In Question 5, we ask whether creating a life of an animal whose welfare level would be positive and of the same magnitude (in absolute value) as the welfare of the animal in the previous question is socially desirable.

The participants in our study show limited consistency with the procreation asymmetry principle when it comes to animals. First, we find that a large majority of respondents (77.4%) support the idea that avoiding the conception of such a life is socially preferable (see Figure 7). Second, we also see strong support in our sample for creating the positive-equivalent life (81.3%, Figure 8). Hence, the level of support is very similar in both cases. Therefore, we cannot conclude from our survey data that people support the procreation asymmetry principle for animals.

Figure 7: Distribution of the answers to Question 4 of the survey about whether it is better to avoid the conception of an animal life that is not worth living.

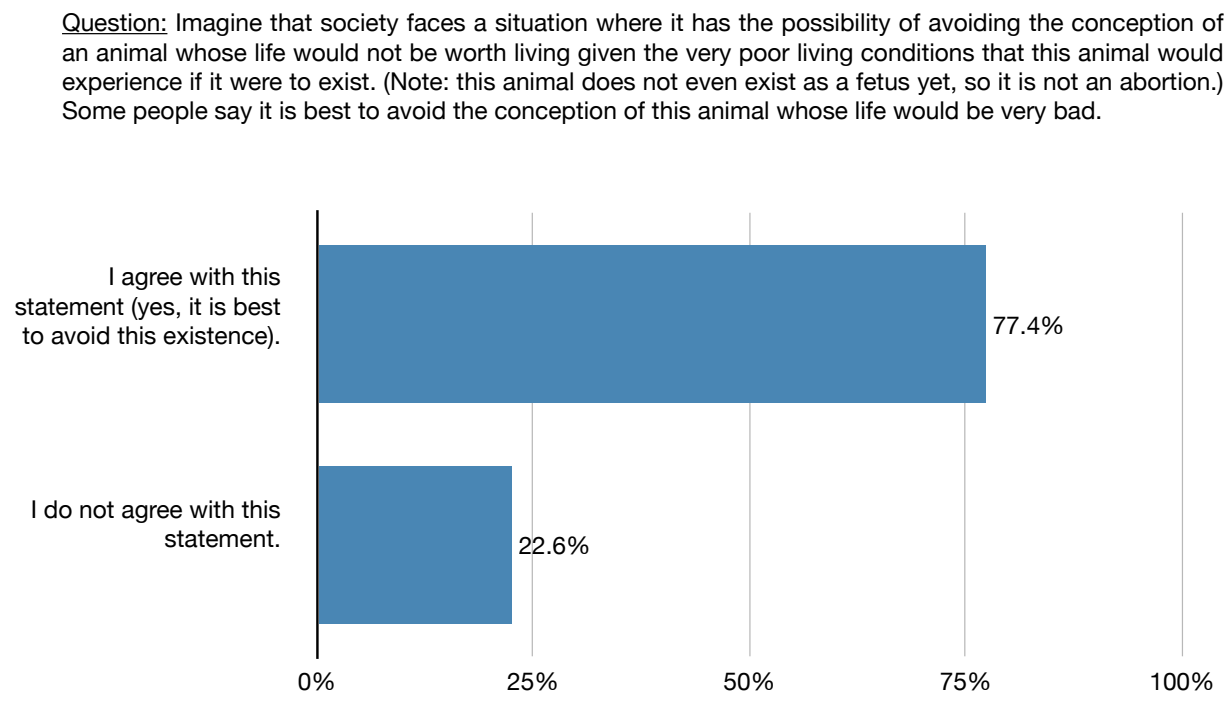
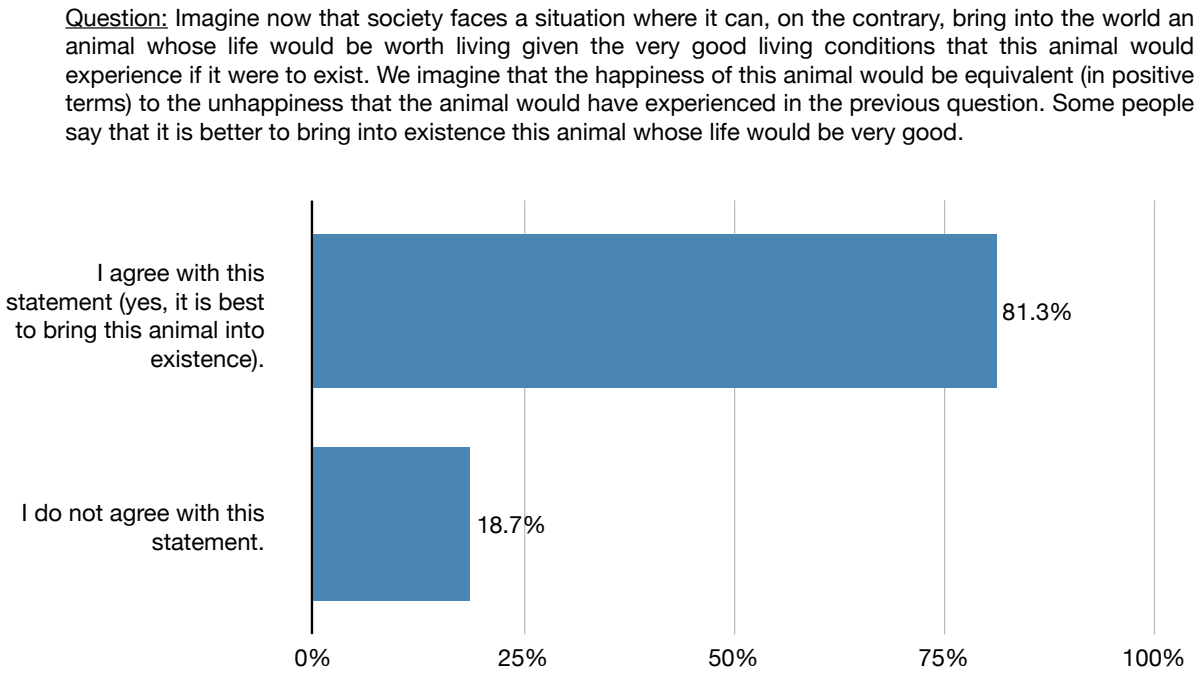


Figure 8: Distribution of the answers to Question 5 of the survey about whether it is better to bring into existence an animal life that is worth living and whose welfare is positive and equivalent, in absolute terms, to the welfare of the animal in Question 4.



4.4 Cluster analysis

We now analyze the heterogeneity in the population with respect to the above questions. Although some issues are consensual, some others appear more divisive. We investigate here whether this heterogeneity observed at the population level results from sporadic deviations at the individual level (e.g., an individual agrees with the majority on all questions but one) or whether it results from a few groups with diverging but consistent views on the topic.

To do so, we perform a cluster analysis. We first compute a dissimilarity matrix using a generalization of Gower's formula for ordinal variables (Gower, 1971) using the R *cluster* package from (Maechler et al., 2023). Second, we cluster the data using Ward clustering (Murtagh and Legendre, 2014), which minimizes the sum of the squared dissimilarities. Third, we evaluate the optimal number of clusters in the sample using the *NbClust* R package (Charrad et al., 2014). The silhouette criterion suggests that our sample is best explained by two clusters of respondents.

We display the results of the cluster analysis in Table 1. First, we show the distributions of the answers in Cluster 1 (N=1,228) and Cluster 2 (N=298). Second, we report the p-values of proportion tests (at the answer level) and of chi2 tests (at the question level). Third, we compute the partial R-squared of each question when we regress a dummy variable of cluster membership on the answers to our eight survey questions.

The heterogeneity in the data is mostly explained by three main questions. The cluster membership is in fact explained by 65.6% by answers to question Q5, 12.6% by answers to question Q4,

and 6.7% by answers to question Q7. Although Clusters 1 and 2 show statistically significantly different answers for Q1, Q3, and Q8 (cf. chi2 tests), the answers to the questions account for a negligible share of the membership of the cluster (partial R2 lower than 2% for Q1, Q3, and Q8).[11]

Table 1: Distribution of answers across clusters.

Question and answer		Distribution of answers (%)		Proportion test	Chi2 test	Partial R^2
		Cluster 1	Cluster 2			
Q1	No weight	3.30	4.00	0.632	0.000	0.006
	Instrumental weight	3.50	4.00	0.793		
	Much less weight	10.4	19.8	0.000		
	A bit less weight	18.2	15.1	0.246		
	Equal weight	43.2	34.9	0.011		
	More weight	21.4	22.1	0.844		
Q2	Direct only	17.8	14.8	0.254	0.254	0.007
	Direct and indirect	82.2	85.2	0.254		
Q3	Less weight to cow	1.50	8.10	0.000	0.000	0.017
	Equal weight	89.1	84.6	0.038		
	More weight to cow	9.40	7.40	0.337		
Q4	Against avoiding	14.2	57.4	0.000	0.000	0.126
	Avoid this life	85.8	42.6	0.000		
Q5	Against creating	2.80	84.2	0.000	0.000	0.656
	Create this life	97.2	15.8	0.000		
Q6	More weight for captive animal	16.6	15.4	0.686	0.011	0.001
	Equal weight	80.1	77.5	0.355		
	More weight for wild animal	3.30	7.00	0.005		
Q7	Non-desirable birth	5.50	15.4	0.000	0.000	0.067
	Neither	37.7	63.1	0.000		
	Desirable birth	56.8	21.5	0.000		
Q8	Non-desirable inequality reduction	12.5	16.1	0.125	0.000	0.004
	Neither	46.1	60.7	0.000		
	Desirable inequality reduction	41.4	23.2	0.000		

Figures in columns 3 and 4 corresponds to the share of participants the cluster who selected the associated answer. Figures in columns 5 and 6 correspond to p-values of proportion and chi2 tests respectively. Figures in column 7 correspond to the partial R-squared of a linear regression of a dummy variable accounting for cluster membership on the answers to all the listed questions.

Overall, Cluster 1 gathers the majority of participants in our sample (80.5%). Its members are likely to think that it is better to bring into existence an animal whose life would be very good (97.2%). They are also likely to think that it is better to avoid a life with a negative welfare which would be comparable in absolute terms to the magnitude of this very good life (85.8%). They also tend to say that, in general, a life with net positive welfare, even small, is desirable (56.8%). In contrast, people in Cluster 2 are much less likely to support the creation of a life with a very good

[11] We also regressed cluster membership on socio-demographic variables (linear model) but detected no statistically significant associations. The two clusters do not appear to be socio-demographically different. A table of summary statistics is displayed in the Supplementary Materials (Table SM3.1).

welfare (15.8%), less likely to oppose avoiding a life with a very bad welfare (42.6%), and less likely to say that a life with small net positive welfare is desirable.

These results suggest that a substantial portion of the population is willing to make ethical judgments regarding the desirability or undesirability of animal lives. Members of Cluster 1 indeed display clear preferences when deciding whether certain lives are worth creating or avoiding, at least in cases of unambiguous welfare—either highly positive or highly negative. In contrast, about one-fifth of the population (Cluster 2) disagrees with the idea of creating lives with positive welfare or avoiding lives with negative welfare. While the source of this disagreement is unclear and warrants further investigation, it may simply reflect a reluctance to engage in normative discussions.

5 Discussion

5.1 Main results and implications for public decisions

Our empirical investigation yields important information on the fairness views of French citizens on animals for public decision.

First of all, we find that a large majority of citizens support the consideration of animal welfare in public decisions. Our results align with those of Johansson-Stenman (2018) on a Swedish sample. The fact that more than nine out of ten citizens support some form of direct inclusion of animal welfare emphasizes the need for economics to develop appropriate tools to value animal welfare. This calls for instance to the quantification and economic valuation of animal welfare in policy evaluation such as in benefit-cost analyses (Budolfson et al., 2024). Although more and more work is done in this direction, this raises important challenges. How to define and qualify 'equal amounts of suffering/welfare'? More generally, how to assess the welfare of animals with different capacities to experience the world (i.e., *Umwelt*)? Overall, this raises the question of interspecies welfare comparisons. While complex, this issue cannot be disregarded by economics: not having an appropriate evaluation framework for actions impacting animal welfare is equivalent to not valuing it or, at best, leaving it to arbitrary and nontransparent appreciation.

Our results also show that the inclusion of animal welfare can impact numerous domains of public decision. Indeed, we provided some evidence that the willingness to consider animal interests covers several species and several contexts. Regarding animals kept in captivity, this implies scrutinizing animal farming, such as intensive farming, but also other forms of captivity. Espinosa (2024) discusses for instance wild animals used in circuses, animals used for high-school teaching, and aquatic mammals used for shows in dolphinariums. Regarding wild animals, our results also call for reconsidering our impact on ecosystems and, importantly, for considering the impact on the *welfare* of the animals living in these areas, not only their instrumental value.

Third, our analysis also reveals that most citizens are willing to consider not only the impact of policies on the welfare of animals but also the impact on the altruistic welfare of humans who care about them. This 'experienced-welfare' approach to social welfare would lead to valuing animal welfare through two channels. We argued that double valuation is not such a strong issue with

animals as with humans because the former might have more limited altruistic preferences. However, it raises another fairness issue that we did not explicitly present to the participants: By valuing the altruistic preferences of humans, we would end up giving more weight to the animals people care about, generating inequality of treatment. That is, an equal amount of suffering in two animals would be associated with differentiated treatment. Ultimately, this might be the very issue of speciesist views in the first place: valuing more the welfare of one animal (i.e., a human) than the welfare of another animal (non-human). Further work could investigate these fairness views and confront citizens with the potential consequences and, if relevant, inconsistencies in their views.

Our survey also extends the question of inequality aversion. We find modest support for interventions that would redistribute welfare more equally among animals, most citizens being indifferent about such policies. This low support is particularly striking given that the inequality-reducing policy was said to increase total welfare. Future works could explore the reasons for the reluctance to intervene by taking resources from some animals to improve the welfare of others. For public policies, this also raises important questions about resource allocations. Including animal welfare into public decision necessitates, indeed, not only to trade off resources allocated to humans with those allocated to animals, but also resources allocated between different animals. Considering animal welfare might lead to investing more resources into reducing intensive farming but it might also necessitate to reallocate some budget devoted to other animals, such as pets, who have the highest levels of welfare among animals kept in captivity. However, one might argue that this issue is not an urgent concern given the very low levels of public resources currently allocated to improving animal welfare.

Importantly, we investigate two questions related to population ethics. These issues, while originally discussed for humans, appear even more consequential when it comes to animals. Indeed, as we recalled in the introduction, more than 80 billion terrestrial animals are raised and slaughtered for human consumption each year, giving humans unprecedented decision-making power about the number of animals that come into existence and die. Here, our results show that many citizens do not adhere to the mere addition principle, suggesting that having a net-positive lifetime utility is not a sufficient condition to say that bringing an animal into existence is socially desirable. Regarding policymaking, this has significant implications. For instance, this goes against total utilitarianism and supports the inclusion of strictly positive critical levels in social welfare functions used to evaluate public intervention. Critical-level utilitarianism would then be more demanding regarding the rearing conditions in animal farming. This issue also relates to remarks made in animal welfare science that criticize the approaches that focus on limiting welfare impairments (i.e., absence of suffering) while not valuing the presence of welfare enhancement opportunities (i.e., the presence of positive experiences). In other words, citizens consider that animal farming cannot just create lives that are barely worth living.

Similarly to numerous opinion surveys, we find homogeneous views in the population above these issues. Our multiverse analyses detected a limited number of associations with demographics. Female, less wealthy, and more plant-based-oriented individuals are more likely to support the

inclusion of animal welfare.[12] However, given the very large number of individuals who support this inclusion overall (93%), it indicates that it is mostly a question about the intensity of the consideration of animal welfare (intensive margin) rather than a question of considering it or not (extensive margin). Regarding the other issues, we found no clear association patterns. Our cluster analysis also shows relatively homogeneous views in our sample. Disagreements mostly emerge on the social desirability of creating a net-positive welfare life. Regarding the implications for public policy, the homogeneity of views suggests that none of the main social groups would strongly oppose the inclusion of animal welfare in public decisions. Note however that some specific social groups could and are likely to do so (e.g., circuses, farming industry, hunters).

5.2 Limitations and future work

Our work aims at providing a first empirical evaluation of the citizens' views about major fairness principles that determine policy evaluation. In this regard, our results should be interpreted with caution given its inherent limitations. One immediate limitation concerns the hypothetical nature of the survey. Stated preferences studies are often subject to social desirability bias. However, it is not given that incentivized surveys would be better at eliciting people's 'true' preferences. For instance, studies that rely on incentivized willingness-to-pay mechanisms often fail to tackle a central issue: the collective dimension of animal welfare. In our survey, we ask participants questions about the fairness principles that, in their eyes, should drive public decisions. They are thus invited to report their views on cases where humans would coordinate to improve the welfare of animals through public policies. Incentivized willingness-to-pay studies usually fail to tackle this issue and look at people's propensity to act at the individual level for animal welfare (e.g., at the grocery store), which does not include collective aspects. Thus, while one should be cautious with respect to the hypothetical nature of the survey, one should also not hold for given that incentivized approaches would systematically perform better.

Another important source of caution for interpretation concerns the nature of the questions asked in our survey. Indeed, our questions are likely unfamiliar to the respondents, both because the latter might not be used to think about such abstract issues and because the questions are cognitively demanding and unusual in their wording. This raises concerns about people's ability to understand and answer our questions clearly. These issues are not specific to our survey and are common problems in empirical social choice generally. However, these problems may be further exacerbated by the fact that our survey deals with animals, adding another layer of complexity and unfamiliarity. Overall, more advanced investigations would benefit from a more refined approach to question design, focusing on thoughtful framing and strategies to reduce respondents' cognitive load—for example, by incorporating concrete numerical questions to ask about abstract ethical

[12]The negative association with wealth is surprising, as a positive association between income or socioeconomic status and prosociality is often observed (Korndörfer et al. (2015); Andreoni et al. (2021)). However, this relationship is not universal, and contradictory findings have been reported in the psychology literature in particular. See the references cited in the two aforementioned papers.

principles.[13] Our research also raises a fundamental question: How do ethical judgments differ when the ethical principle concerns animals versus human beings? While we have highlighted some parallel findings, such as those related to inequality and procreation asymmetry, a more systematic analysis is clearly warranted.

More fundamentally, our study raises questions about policy implications. As we discussed above, if policymakers want to evaluate public decisions based on the fairness principles that citizens think should drive their public action, our results would call for substantial changes which would allow for the direct (and possibly indirect) valuation of animal welfare in a wide range of issues. However, this raises questions related to the political system. First, it is unclear whether policy evaluation should be (entirely) based on voters' preferences. Political systems are of course made and run by humans, and, from a practical perspective, animal welfare can only be considered if humans are willing to do so. But, from an ethical perspective, it is unclear why animal welfare should deserve protection only when humans deem it so. Similar questions occur for some groups of humans who are not part of the political system, such as migrants in today's world or slaves in recent history. Eliciting people's views about the fairness principles that should drive public action is therefore informative about the political feasibility of considering animal welfare but might not be the reason to plead for it in the first stage. Second, regarding political feasibility, it is also unclear why the political gap between people's large support for animal welfare enhancing policies and the absence of implementation of such policies by elected representatives would not apply to policy evaluation in a similar manner. So far, the political process has indeed been unable to translate people's support for policies aimed at improving animal welfare into effective interventions.[14] It is thus unclear why a change in the policy evaluation framework to account for animal welfare would be easier to achieve than the implementation of policies directly improving animal welfare.

As our results demonstrate, the room for future research is vast, at the theoretical and empirical levels, as well as at the positive and normative levels. At the theoretical normative level, our work illustrates the challenges in converging towards a robust normative theory to evaluate policies affecting animals. The general social welfare function that we borrowed from Budolfson et al. (2024) serves only as an illustration. More work is needed to understand the premises and consequences of various multi-species social welfare functions. Although recent work such as Zuber et al. (2024) helps clarify the set of relevant normative frameworks, economic theory is still far from reaching a consensus on a broadly accepted and easily implementable multi-species social welfare function. In addition, still at the theoretical normative level, most if not all normative frameworks in this emerging field are utilitarian and thus consequentialist. While we did not specifically investigate this question here, we observe significant deontological views when it comes to the creation and

[13]Such changes could significantly alter the results of the analysis. For instance, Gaertner and Schokkaert (2012) underline that what researchers sometimes consider "ethically irrelevant variations in the formulation" can generate significant variations in the respondents' answers, emphasizing the issue of framing. One of the prominent cases concerns the use of verbal vs. numerical testing options because verbal approaches might convey different normative insight compared to numerical approaches (e.g., Schokkaert and Devooght (2003)), while numerical approaches might better illustrate the justice principles at stake (e.g., Hurley et al. (2011)).

[14]It is worth noting, however, that similar political limitations arise in debates about future generations (Feinberg, 1974).

slaughter of animals in society. An important research agenda would consist of looking at normative frameworks that allow the inclusion of such values and discussing their relevance.

A related concern relates to the underlying approach to defining welfare. Nearly all the questions reflect a distinctly utilitarian perspective, using terms like "suffering" (Q1, Q2, Q3, Q6), "happiness" (Q7, Q8), and "pleasures" (Q7). While participants may indeed value concepts such as utility, happiness, or pleasure, it is unclear whether these are the only dimensions they consider important. This raises the question of how such framing might influence participants' responses. For instance, consider a libertarian who prioritizes opportunities for humans and animals rather than utility. How might their responses differ? A libertarian concerned with inequality—specifically inequality of opportunities—might not favor redistributing happiness but instead focus on redistributing opportunities, such as improving living conditions.

At the theoretical positive level, more work is needed to understand the mechanisms at play. For instance, the gap between observed and stated preferences is often put forward as a way to not consider stated preferences. An example concerns the fact that consumers buy products mainly from intensive farms, but concomitantly report being against intensive farming. The most frequent explanation for this gap is the problem of coordination, or social desirability in questionnaires. However, theoretical works could help explore alternative reasons: dual cognitive processes (fairness thinking at the polling booth vs. selfish thinking at the grocery store), imperfect altruism, etc.

Empirical analyses can test for these theories and bring valuable insight into their sophistication. For instance, normative discussions must also seek to understand the difference in the support of various fairness principles when considering humans versus animals. A good illustration is Kahane and Caviola (2023), which suggests that humans tend to adopt a utilitarian approach for animals, with a more deontological approach for humans. It indicates that the deontological component is strongest for humans, followed by dogs, chimpanzees, pigs, and finally inanimate objects. Understanding the reasons driving these differences might help to understand the political feasibility of including the welfare of animals in policy evaluation. Importantly, empirical analyses can help to understand and distinguish fairness principles and altruistic concerns towards animals. These two concepts play different roles in public decisions, as illustrated in our social welfare function.

CRediT author statement. Conceptualization, Formal Analysis, Supervision, Writing - original draft: RE and NT. Data curation, Funding acquisition, Investigation, Methodology, Project Administration, Software, Visualization: RE.

Competing Interests. This research is funded by the French National Agency for Research (ANR) under grant ANR-19-CE21-0005-01. The authors declare no potential conflict of interest. RE serves as the Director of the French CNRS research group "Animal Welfare Research Observatory" (uncompensated) and sits on the advisory board of the research group "Animal Welfare Economics Working Group" (uncompensated). NT serves as an unpaid member of the "French Sustainable Development Commission" for the French government, the scientific committee of the "Greener by Default" association, and the "Animal Welfare Research Observatory".

Ethics Information This work received the approval of the ethics committee of the Centre International de Recherche en Environnement et Développement in May 2023 (IRB approval number: IRB-CIRED-2023-1). It complies with all relevant ethical regulations for research with human participants. All of the participants were recruited through a representative sampling survey company called MSI and were compensated financially by the survey company for their participation in accordance with local standard rates.

Code and data availability. The data and codes to replicate the paper are available here: https://doi.org/10.5281/zenodo.14000142

References

Adler, M. (2011). Well-being and fair distribution: Beyond cost-benefit analysis. Oxford University Press.

Amiel, Y. and Cowell, F. (1999). Thinking about inequality: Personal judgment and income distributions. Cambridge University Press.

Andreoni, J., Nikiforakis, N., and Stoop, J. (2021). Higher socioeconomic status does not predict decreased prosocial behavior in a field experiment. Nature communications, 12(1):4266.

Arrhenius, G., Bykvist, K., Campbell, T., and Finneron-Burns, E. (2022). The Oxford handbook of population ethics. Oxford University Press.

Bastian, B., Loughnan, S., Haslam, N., and Radke, H. R. (2012). Don't mind meat? the denial of mind to animals used for human consumption. Personality and Social Psychology Bulletin, 38(2):247–256.

Bergstrom, T. C. (1999). Systems of benevolent utility functions. Journal of Public Economic Theory, 1(1):71–100.

Blackorby, C., Bossert, W., and Donaldson, D. J. (2005). Population issues in social choice theory, welfare economics, and ethics. Number 39. Cambridge University Press.

Blackorby, C. and Donaldson, D. (1992). Pigs and guinea pigs: a note on the ethics of animal exploitation. The Economic Journal, 102(415):1345–1369.

Browning, H. (2023). Welfare comparisons within and across species. Philosophical Studies, 180(2):529–551.

Bruers, S. (2022). Population ethics and animal farming. Environmental Ethics, 44(4).

Budolfson, M., Espinosa, R., Fischer, B., and Treich, N. (2024). Monetizing animal welfare impacts for benefit–cost analysis. Journal of Benefit-Cost Analysis, pages 1–18.

Budolfson, M. and Spears, D. (2019). Quantifying animal well-being and overcoming the challenge of interspecies comparisons. In The Routledge handbook of animal ethics, pages 92–101. Routledge.

Cantone, G. G. and Tomaselli, V. (2024). Theory and methods of the multiverse: an application for panel-based models. Quality & Quantity, 58(2):1447–1480.

Charrad, M., Ghazzali, N., Boiteau, V., and Niknafs, A. (2014). Nbclust: an R package for determining the relevant number of clusters in a data set. Journal of statistical software, 61:1–36.

Clark, B., Stewart, G. B., Panzone, L. A., Kyriazakis, I., and Frewer, L. J. (2017). Citizens, consumers and farm animal welfare: A meta-analysis of willingness-to-pay studies. Food Policy, 68:112–127.

Diamond, P. A. and Hausman, J. A. (1994). Contingent valuation: Is some number better than no number? Journal of economic perspectives, 8(4):45–64.

EFSA, P. o. A. H., Welfare, A., Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Canali, E., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Gortazar Schmidt, C., et al. (2023a). Welfare of calves. Efsa Journal, 21(3):e07896.

EFSA, P. o. A. H., Welfare, A., Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Canali, E., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Gortázar Schmidt, C., et al. (2023b). Welfare of dairy cows. EFSA Journal, 21(5):e07993.

EFSA, P. o. A. H., Welfare, A., Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Canali, E., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Schmidt, C. G., et al. (2023c). Welfare of broilers on farm. EFSA Journal, 21(2):e07788.

EFSA, P. o. A. H., Welfare, A., Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Canali, E., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Schmidt, G., et al. (2022). Welfare of pigs on farm. EFSA Journal, 20(8):e07421.

Espinosa, R. (2024). Animals and Social Selfare. Social Choice and Welfare, 62(3):465–504.

Espinosa, R. and Treich, N. (2021). Animal welfare: antispeciesism, veganism and a "life worth living". Social Choice and Welfare, 56:531–548.

Espinosa, R. and Treich, N. (2024a). Animal welfare as a public good. Ecological Economics, 216:108025.

Espinosa, R. and Treich, N. (2024b). The Animal Welfare Levy. Mimeo.

Espinosa, R. and Treich, N. (2024c). Beyond anthropocentrism in agricultural and resource economics. Australian Journal of Agricultural and Resource Economics, 68(3):541–566.

Feinberg, J. (1974). The rights of animals and unborn generations. In Philosophy and Environmental Crisis, pages 43–68. The University of Georgia Press.

Fischer, B. (2023). The welfare range table. Report - Rethink Priorities.

Fleurbaey, M. and Leppanen, C. (2021). Toward a theory of ecosystem well-being. Journal of Bioeconomics, 23(3):257–295.

Gaertner, W. and Schokkaert, E. (2012). Empirical social choice: questionnaire-experimental studies on distributive justice. Cambridge University Press.

Gower, J. C. (1971). A general coefficient of similarity and some of its properties. Biometrics, pages 857–871.

Hurley, J., Buckley, N. J., Cuff, K., Giacomini, M., and Cameron, D. (2011). Judgments regarding the fair division of goods: the impact of verbal versus quantitative descriptions of alternative divisions. Social Choice and Welfare, 37:341–372.

Johansson-Stenman, O. (2018). Animal welfare and social decisions: Is it time to take Bentham seriously? Ecological Economics, 145:90–103.

Kagan, S. (2019). How to count animals, more or less. Oxford University Press.

Kahane, G. and Caviola, L. (2023). Are the folk utilitarian about animals? Philosophical Studies, 180(4):1081–1103.

Korndörfer, M., Egloff, B., and Schmukle, S. C. (2015). A large scale test of the effect of social class on prosocial behavior. PloS one, 10(7):e0133193.

Kuruc, K. and McFadden, J. (2023). Animal welfare in economic analyses of food production. Nature Food, 4(5):355–356.

Maechler, M., Rousseeuw, P., Struyf, A., Hubert, M., and Hornik, K. (2023). cluster: Cluster Analysis Basics and Extensions. R package version 2.1.6.

Matheny, G. and Chan, K. M. (2005). Human diets and animal welfare: The illogic of the larder. Journal of Agricultural and Environmental Ethics, 18:579–594.

McMahan, J. (1981). Problems of population theory. University of Chicago Press.

Mood, A. and Brooke, P. (2024). Estimating global numbers of fishes caught from the wild annually from 2000 to 2019. Animal Welfare, 33:e6.

Murtagh, F. and Legendre, P. (2014). Ward's hierarchical agglomerative clustering method: Which algorithms implement ward's criterion? Journal of classification, 31:274–295.

Ng, Y.-K. (1989). What should we do about future generations?: Impossibility of parfit's theory x. Economics & Philosophy, 5(2):235–253.

Ng, Y.-K. (1995). Towards welfare biology: Evolutionary economics of animal consciousness and suffering. Biology and Philosophy, 10:255–285.

Parfit, D. (1984). Reason and Persons. Oxford University Press.

Persson, K. and Shaw, D. (2015). Empirical methods in animal ethics. Journal of Agricultural and Environmental Ethics, 28:853–866.

Robinson, T. P., Thornton, P. K., Francesconi, G. N., Kruska, R., Chiozza, F., Notenbaert, A. M. O., Cecchi, G., Herrero, M. T., Epprecht, M., Fritz, S., et al. (2011). Global livestock production systems. FAO and ILRI.

Schokkaert, E. and Devooght, K. (2003). Responsibility-sensitive fair compensation in different cultures. Social Choice and Welfare, 21(2):207–242.

Simonsohn, U., Simmons, J. P., and Nelson, L. D. (2020). Specification curve analysis. Nature Human Behaviour, 4(11):1208–1214.

Singer, P. (1975). Animal Liberation: A New Ethics of Our Treatment of Animals. Random House.

Spears, D. (2020). The asymmetry of population ethics: experimental social choice and dual-process moral reasoning. Economics & Philosophy, 36(3):435–454.

Steegen, S., Tuerlinckx, F., Gelman, A., and Vanpaemel, W. (2016). Increasing transparency through a multiverse analysis. Perspectives on Psychological Science, 11(5):702–712.

Vezirian, K., Bègue, L., and Bastian, B. (2024). Mindless furry test-tubes: Categorizing animals as lab-subjects leads to their mind denial. Journal of Experimental Social Psychology, 114:104629.

Višak, T. (2013). Killing happy animals: Explorations in utilitarian ethics. Springer.

Zuber, S., Spears, D., and Budolfson, M. (2024). Separable social welfare evaluation for multispecies populations. Mimeo.

Zuber, S., Venkatesh, N., Tännsjö, T., Tarsney, C., Stefánsson, H. O., Steele, K., Spears, D., Sebo, J., Pivato, M., Ord, T., et al. (2021). What should we agree on about the repugnant conclusion? Utilitas, 33(4):379–383.

Appendix: Multiverse specification

We run multiverse analyses to explore the relations between the dependent variables and the socio-demographics of interest. The objective of multiverse analysis is to report robust associations that would not be subject to specific statistical models, coding decisions, and exclusion rules. We detail below the alternatives we consider for the econometric model, the socio-demographic independent variables, and the exclusion rules. Note that all models are corrected for heteroskedasticity. We explore the combinations of all the alternatives of each decision node (including the non-inclusion of independent variables). A specific combination of alternatives is called a *universe*. The set of all universes is called the *multiverse*. Our multiverse consists of 97,200 universes.

1. Econometric Model:

For questions Q1, Q2, Q4, and Q5:
1.1. Linear Model
1.2. Probit (for binary variables), Ordered Probit (for ordered variables)
1.3. Logit (for binary variables), Ordered Logit (for ordered variables)
For Q3, Q6, Q7, and Q8:
1.4. Multinomial Logit Model

2. Variables:

2.1 Age:
2.1.0. Not included
2.1.1. Linear
2.1.2. Second-order polynomial

2.2 Gender:
2.2.0. Not included
2.2.1. Dummy variable for female participants

2.3. Political orientation:
2.3.0. Not included
2.3.1. Continuous variable (between 0 and 10) with a dummy for missing values.
2.3.2. Categorical variable recoded from the Likert-scale values: Extreme-left: 0,1,2; Left: 3,4; Center: 5; Right: 6,7; Extreme-Right: 8,9,10; No answer.
2.3.3. Categorical variable: Extreme-left: 0,1; Left:2,3; Center: 4,5,6; Right: 7,8; Extreme-Right: 9,10; No answer.

2.4. Income:
2.4.0. Not included
2.4.1. Categorical variable: Reference group: between 2000 EUR and 3000 EUR per month.

2.5. Food consumption:
2.5.0. Not included
2.5.1. Principal-Component Analysis: Second Dimension only (2nd dimension: positive

correlation with animal-based products and negative correlation with plant-based products).
2.5.2. Principal-Component Analysis: First and Second Dimensions only (1st dimension: positive correlation with all elements).

2.6. Religiosity:
2.6.0. Not included
2.6.1. Continuous variable
2.6.2. Second-order polynomial
Note: two missing values for religiosity, recoded. We controlled with a dummy variable for missing values but the dummy variable cannot be estimated (colinearity). Given the low number of observations concerned, we do not consider this to be an issue.

3. Exclusion Rules

3.1. Exclusion based on time spent on the associated screen:
3.1.0. No exclusion
3.1.1. Less than 5 seconds for the associated screen
3.1.2. Less than 10 seconds for the associated screen
3.1.3. Less than the 5th quantile
3.1.4. Less than the 10th quantile

3.2. Exclusion based on the time spent on the entire section about animal welfare:
3.2.0. No exclusion
3.2.1. Less than 3 minutes for the section
3.2.2. Less than 5 minutes for the section
3.2.3. Less than the 5th quantile
3.2.4. Less than the 10th quantile

3.3. Exclusion based on the inconsistency between food consumption and dietary identity:
3.3.0. No exclusion
3.3.1. Exclude vegans and vegetarians who report eating at least one presumably excluded food item more often than 'Never'.
3.3.2. Exclude vegans and vegetarians who report eating at least one presumably excluded food item more often than 'A few times a year'.

Supplementary Materials:
Fairness Judgments About Animals

Romain Espinosa, Nicolas Treich
February 11, 2025

Supplementary Materials 1: Survey instructions

Q1: Society can reduce animal as well as human suffering through various, usually costly, measures. To be able to prioritize, we need to know how great a weight society should place on reducing suffering in an animal (such as a cow) compared with reducing an equal amount of suffering in a human. Which of the following statements is most in accordance with your opinion regarding the weight that should be given to animal suffering in public decisions?

- Animal suffering should not count at all in public decisions.
- Animal suffering should not count per se. However, some people suffer when knowing that animals suffer, and this should be taken into account in public decisions.
- Animal suffering should be taken into account to a certain extent in public decisions, even when no human beings suffer when knowing that animals suffer. However, animal suffering should be given much less weight than human suffering.
- Animal suffering should be taken into account to a fairly high degree in public decisions, even when no human beings suffer when knowing that animals suffer. However, animal suffering should be given somewhat less weight than human suffering.
- Animal suffering should be taken into account to a degree equal to human suffering in public decisions, even when no humans suffer when knowing that animals suffer.
- Animal suffering should be taken into account to a very high degree in public decisions, even when no human beings suffer when knowing that animals suffer. Animal suffering should be given more weight than human suffering.

———————————————*Page break*———————————————

Q2: Imagine that society decides to give direct weight to animal suffering in public decisions (we speak of direct weight when we are interested in the suffering of animals for themselves, that is to say even when humans do not care). Some people wonder whether we should also into account human concerns for animals in public decisions (what we call indirect weight). For example, if we put in place a policy to prevent suffering in dogs, should we also take into consideration the fact that their owners are unhappy that the dogs are suffering? Some experts say that animals and humans both suffer, and therefore both types of suffering should be taken into account. Others say it would be like counting the animal's suffering twice. Which of the following statements best corresponds to your opinion?

- Society should take into account the suffering of the animal as well as the concerns of human beings for the suffering of the animal (direct and indirect weight).
- Society should only take into account the suffering of the animal (direct weight only).

———————————————*Page break*———————————————

Q3: Imagine that society decides to give direct weight to animal suffering in public decisions. Should it give equal weight to reducing the suffering of animals of different species? For example, imagine that society can reduce an equal amount of suffering in a cow or in a chicken: should it give equal weight to reducing the suffering of the cow and that of the chicken? Which of the following statements best corresponds to your opinion?

- Reducing suffering in a cow should matter more than reducing the same amount of suffering in a chicken.
- Reducing suffering in a cow should count for less than reducing the same amount of suffering in a chicken.
- Reducing suffering in a cow should count as much as reducing the same amount of suffering in a chicken.

———————————————*Page break*———————————————

Q4: Imagine that society faces a situation where it has the possibility of avoiding the conception of an animal whose life would not be worth living given the very poor living conditions that this animal would experience if it were to exist. (Note: this animal does not even exist as a fetus yet, so it is not an abortion.) Some people say it is best to avoid the conception of this animal whose life would be very bad.

- I agree with this statement (yes, it is best to avoid this existence).
- I do not agree with this statement.

———————————————*Page break*———————————————

Q5: Imagine now that society faces a situation where it can, on the contrary, bring into the world an animal whose life would be worth living given the very good living conditions that this animal would experience if it were to exist. We imagine that the happiness of this animal would be equivalent (in positive terms) to the unhappiness that the animal would have experienced in the previous question. Some people say that it is better to bring into existence this animal whose life would be very good.

- I agree with this statement (yes, it is best to bring this animal into existence).
- I do not agree with this statement.

———————————————*Page break*———————————————

Q6: Now imagine that society faces a situation where it can reduce the same amount of suffering in two animals of the same species. We assumed that these two animals experience the same living conditions today. One of the animals is raised in captivity while the other animal lives in a wild environment. How much weight should we give to the suffering of these two animals?

- The suffering of the animal raised in captivity should have greater weight
- The suffering of animals living in the wild should have greater weight
- Both types of suffering should be given equal weight

———————————————*Page break*———————————————

Q7: Imagine a society with several animals. Imagine that in this society we could give birth to a new animal, and that, if it were to be born, it would have a life made up mainly of happiness and pleasures. Over the entire duration of its life, it is estimated that the happiness of this new animal would be a little lower than that of animals that already exist, but that it is still positive. Do you consider that the birth of this animal would be desirable?

- The birth of this animal would be desirable
- The birth of this animal would be neither desirable nor undesirable
- The birth of this animal would not be desirable

———————————————————*Page break*———————————————————

Q8: Imagine a society with several animals that experience different levels of happiness (some are very happy, others are happy but a little bit less). A public policy is implemented and reduces inequalities in animal happiness (the less happy become a bit happier, and the happier ones become a bit less happy). Overall, the total sum of happiness and average happiness increase a little. Do you consider this policy desirable?

- This policy of reducing inequalities is desirable
- This policy is neither desirable nor undesirable
- This policy of reducing inequalities is not desirable

Supplementary Materials 2: Results of the Multiverse Analysis

Figure SM2.1: Results of the Multiverse Analysis for Q1

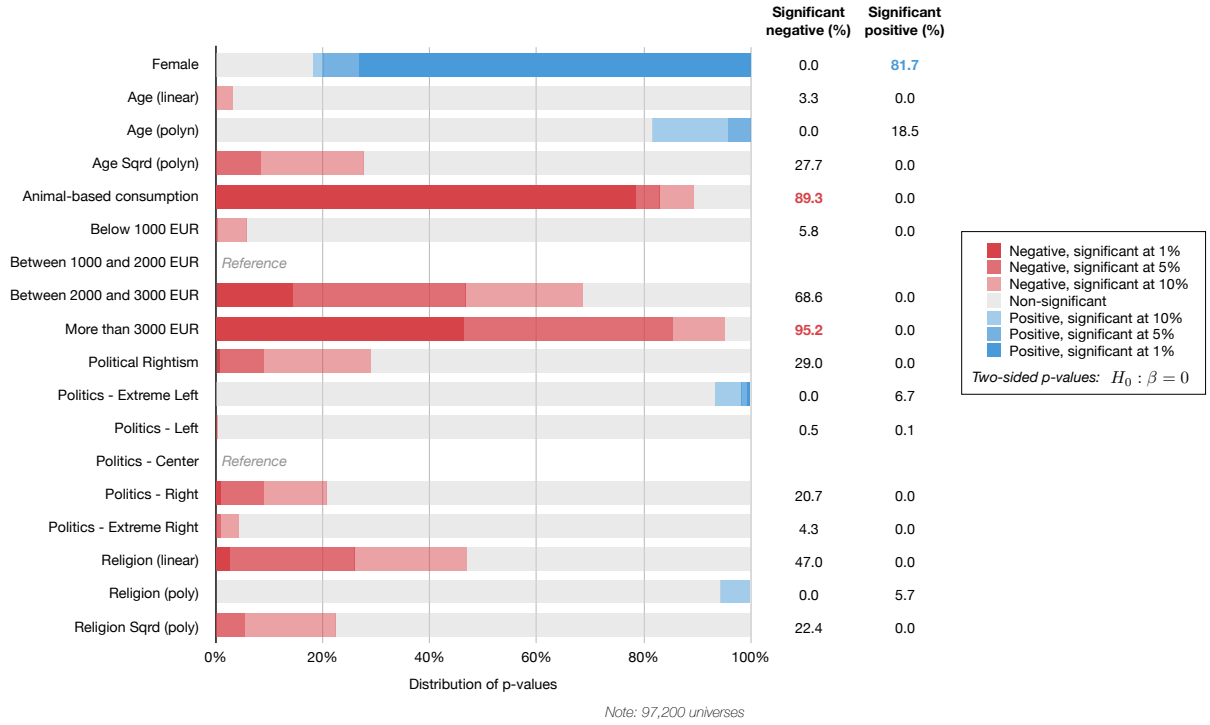


Figure SM2.2: Results of the Multiverse Analysis for Q2

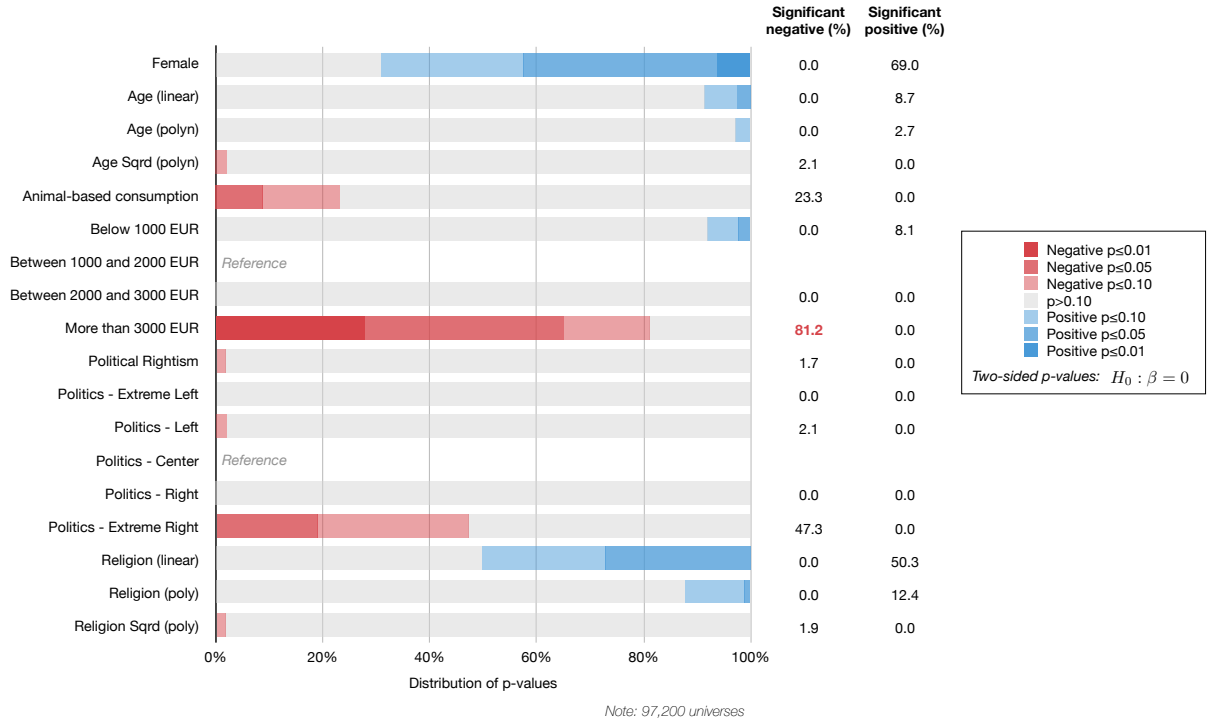


Figure SM2.3: Results of the Multiverse Analysis for Q3 - Multinomial Logit

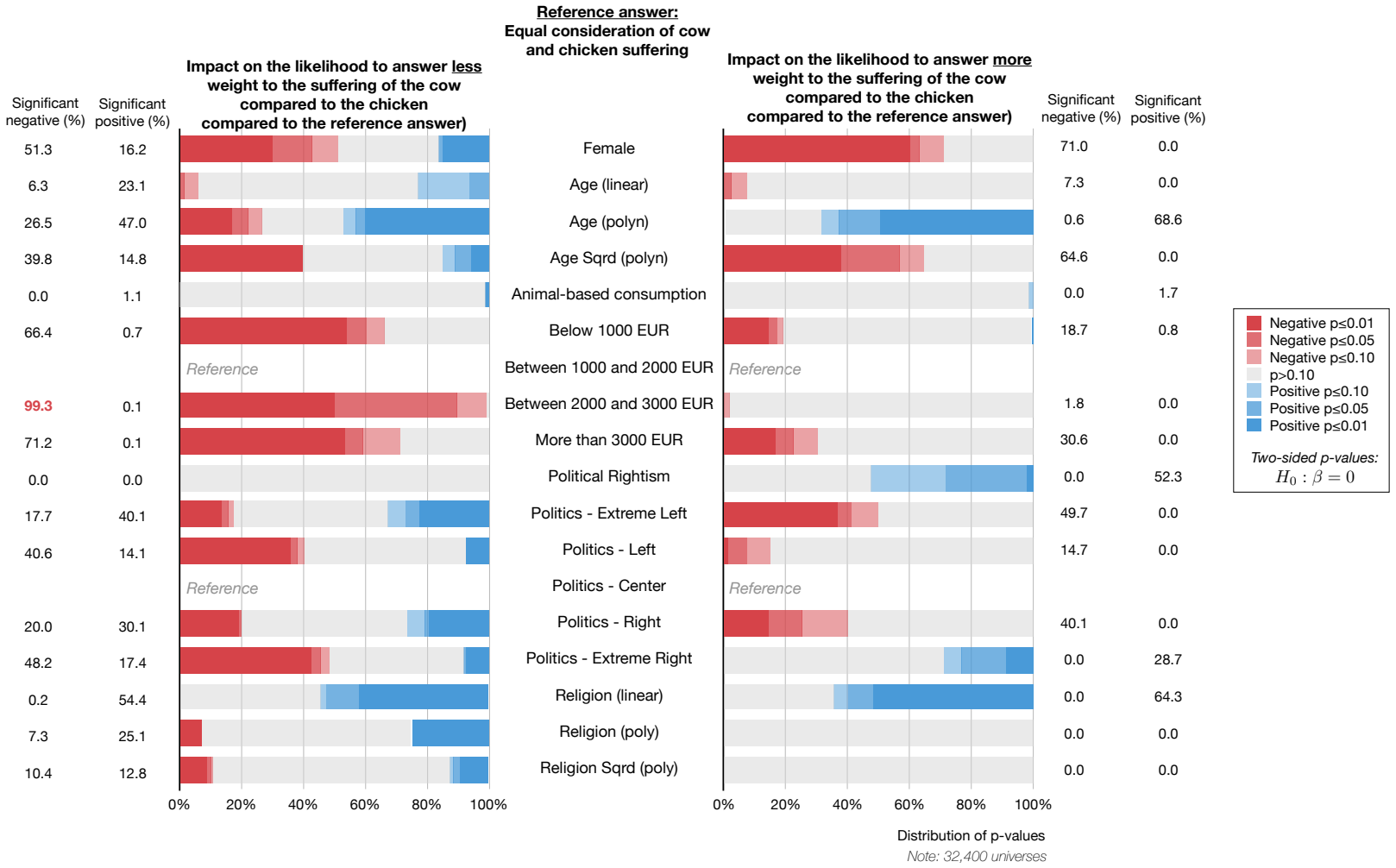
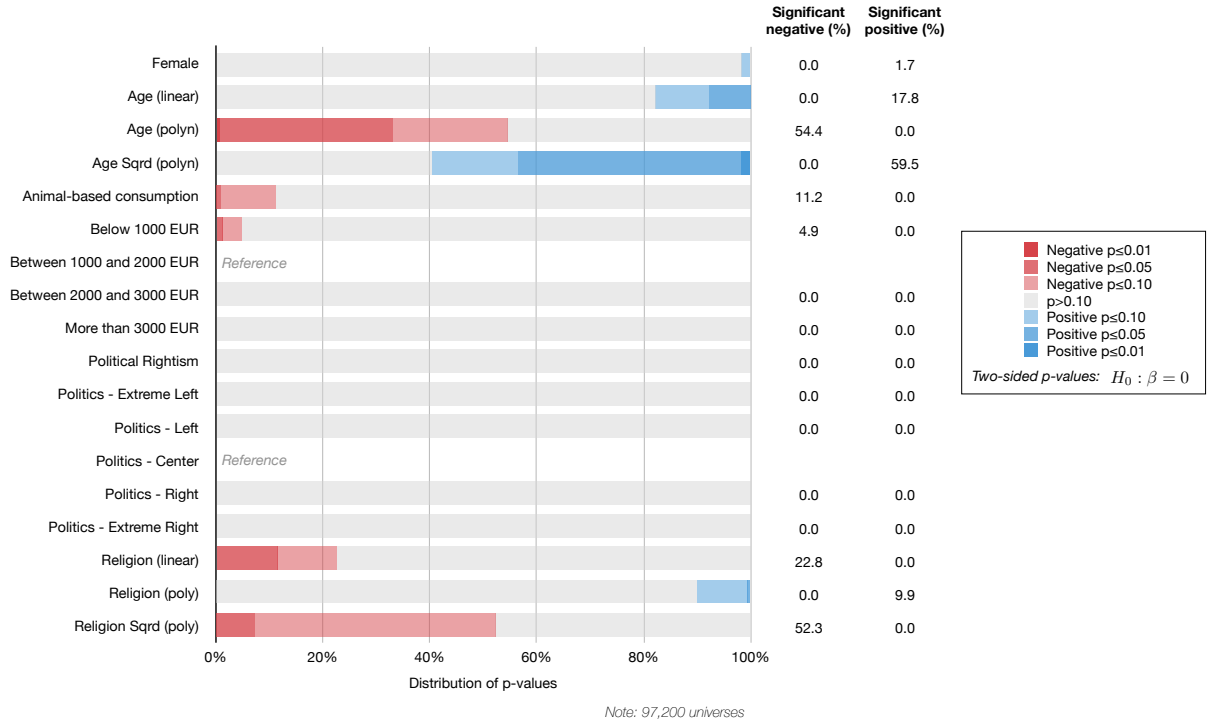


Figure SM2.4: Results of the Multiverse Analysis for Q4



Note: 97,200 universes

Figure SM2.5: Results of the Multiverse Analysis for Q5

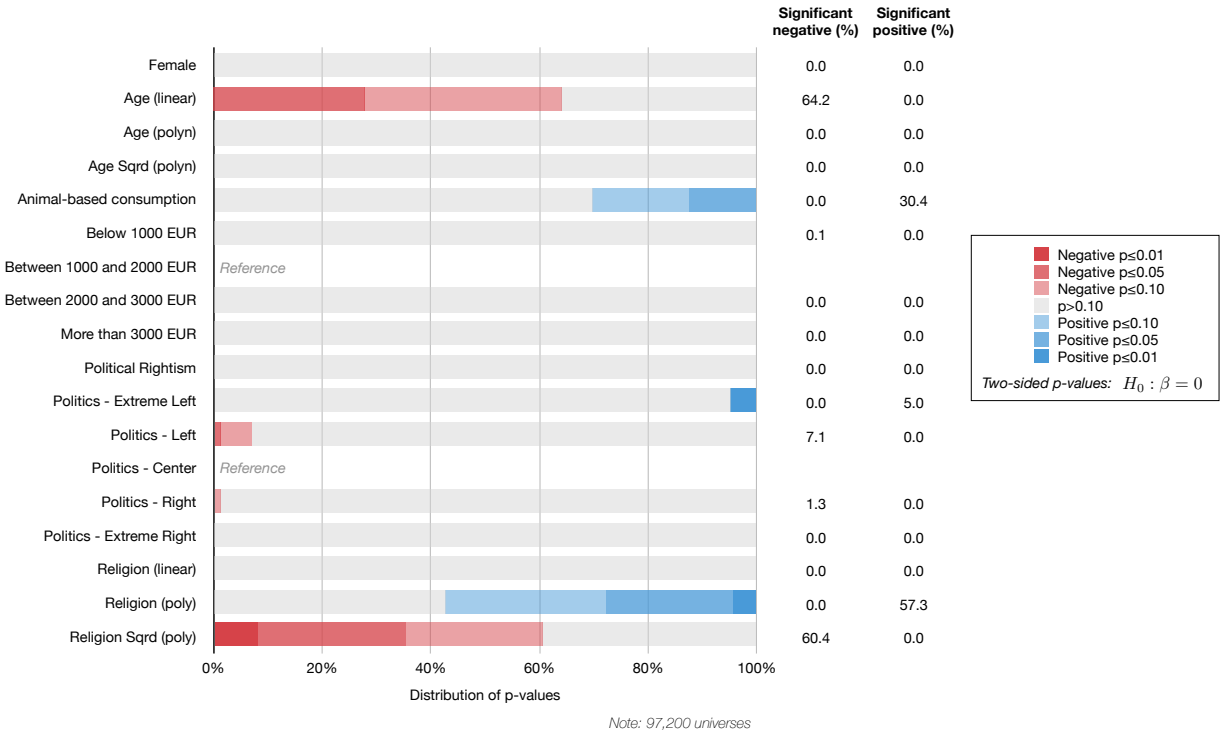


Figure SM2.6: Results of the Multiverse Analysis for Q6 - Multinomial Logit

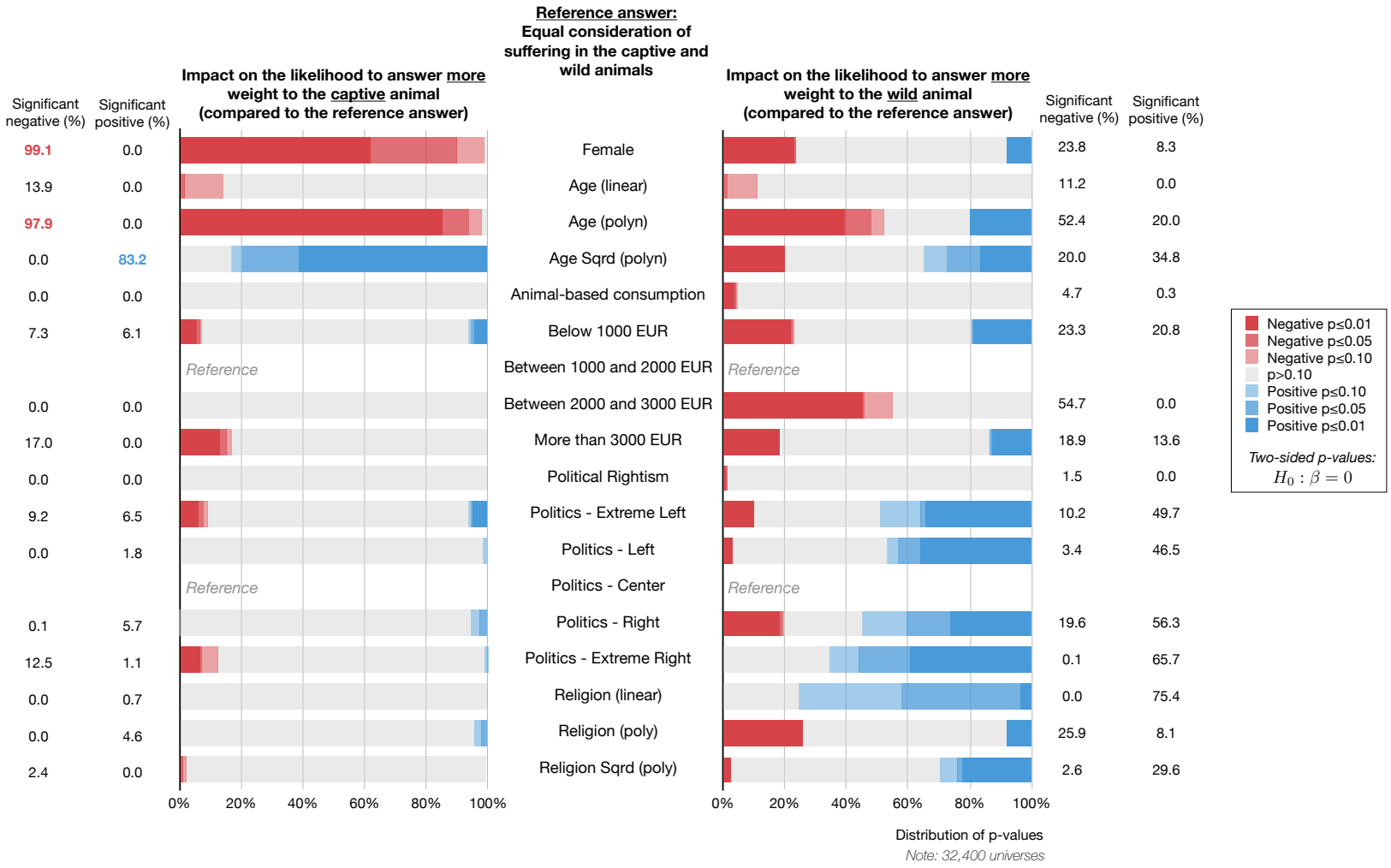
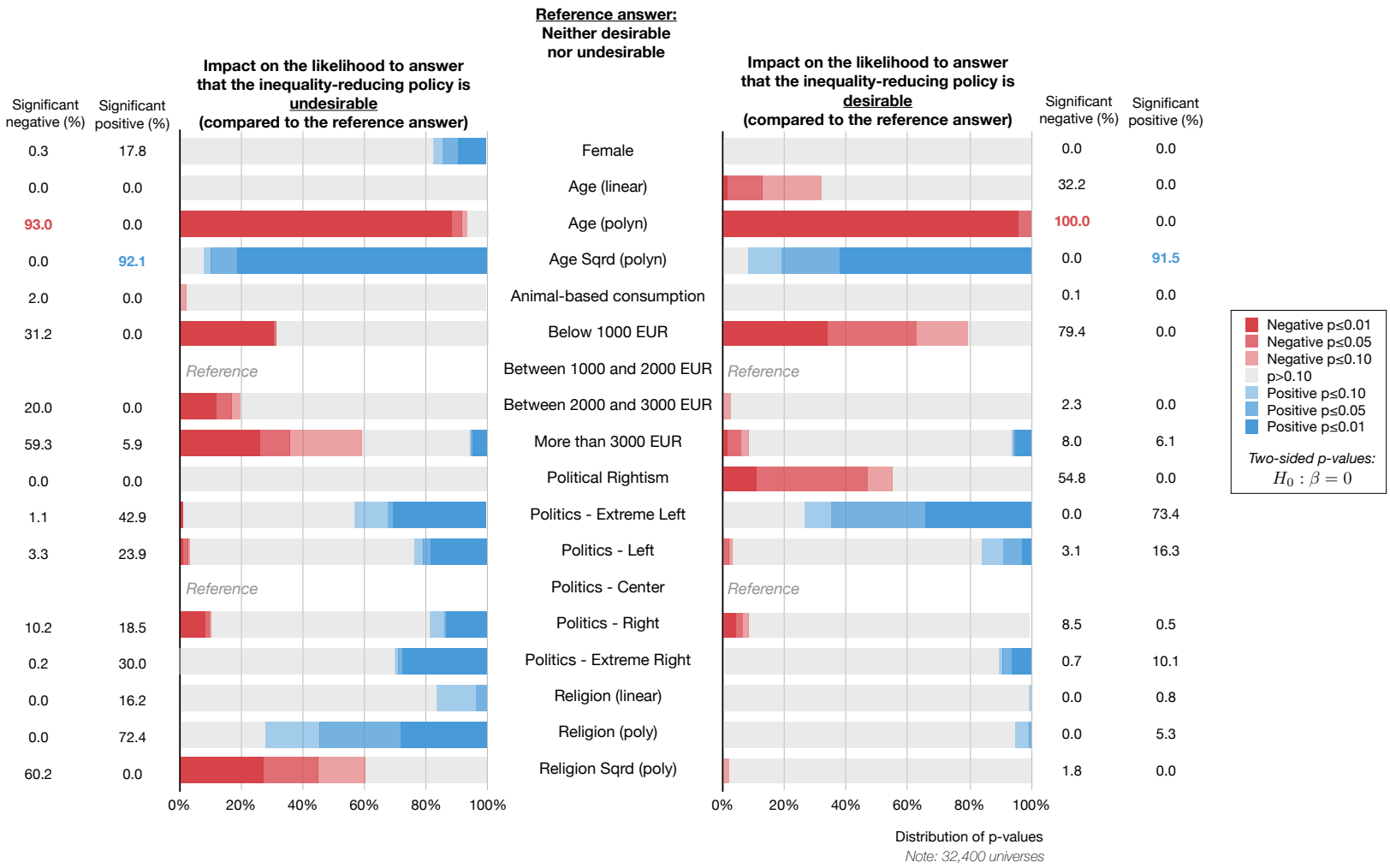


Figure SM2.7: Results of the Multiverse Analysis for Q8 - Multinomial Logit



Supplementary Materials 3: Demographics of Clusters

Table SM3.1: Distribution of demographics across clusters.

Variable	Distribution (%)		Proportion test
	Cluster 1	Cluster 2	p-value
Male	45.2	45.0	0.995
Female	54.8	55	0.995
Extreme-left	5.8	5.4	0.892
Left	18.0	15.8	0.412
Center	42.8	42.6	0.998
Right	21.4	22.1	0.844
Extreme-right	10.3	12.8	0.254
No answer	1.7	1.3	0.846
Less than 1000 Euros	8.1	11.4	0.085
Between 1000 and 2000 Euros	32.6	32.9	0.973
Between 2000 and 3000 Euros	33.6	31.2	0.466
More than 3000 Euros	21.2	20.5	0.851
No answer	4.6	4.0	0.807

Variable	Average		Wilcoxon test
	Cluster 1	Cluster 2	p-value
Religiosity	3.474	3.530	0.814
Age	46.01	47.097	0.273
Animal-Based Consumption	-0.006	0.026	0.157