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Who likes circus animals?

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Abstract

Using a sample based on 268 questionnaires submitted to people attending the Acquatico Bellucci circus, Italy, this paper analyzes the circusgoers's preferences for circus animals. Results show that higher preferences for circus animals are related to frequency of consumption. However, differently from what commonly expected, more educated and younger people seem to be less sensitive to the claims of animal welfare organizations.

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1. Introduction

Animals play a vital role in the performances of traditional circuses. However, worldwide there is a growing movement against the use of animals in the circus shows. Many animal welfare campaigners want wild animals banned from circuses, claiming it is undignified and wrong, and animal lobbies have induced Parliaments to produce more and more stringent legislations on animal welfare. These regulations are likely to preclude smaller circuses from having numbers with animals, as well as imposing growing costs on bigger circus which will impact on future shows, undermining the possibility for traditional circuses to exist in the future.

Without going into the debate on animal rights, which is out of the scope of this study, an implicit assumption in such a debate is that circusgoers like circus animals. Is it true? The purpose of this paper is to empirical investigate such a question. To this aim, a sample of 268 questionnaires submitted to people attending Acquatico Bellucci circus in Alessandria (Italy) were used.

This paper contributes to the literature in a number of respects. First, it sheds light on the market for circus; more specifically, it is the first study to investigate the circusgoers' preference for circus animals. Secondly, it adds some evidence to the debate on circus animal welfare to the extent that it helps to identify characteristics which make people more sensible to ban wild animals from circuses.

The rest of the paper is organized as follows. Section 2 describes method and data. Results are discussed in Section 3. Section 4 concludes.

2. Method and data

Circusgoers's preferences for circus animals are represented by a continuous latent variable Y^*, since these preferences are not directly observable, the questionnaire responses, Y, are used as a proxy for such preferences. The impact of independent variables on preferences for animal circus are assessed by applying the generalized ordered logit model, which relaxes the assumption of the standard ordinal regression analysis that the explanatory variables have equal effects across the levels of preference.

The generalized ordered logit model estimates a set of coefficients for each of the $M-1$ points at which the dependent variable can be dichotomized. It can be shown that the probabilities that Y will take on each of the values $1,..., M$ are equal to

$$\begin{aligned} \boldsymbol{P}(\boldsymbol{Y}_i = 1) &= 1 - \boldsymbol{F}(\boldsymbol{X}_i'\beta_1) \\ \boldsymbol{P}(\boldsymbol{Y}_i = \boldsymbol{j}) &= 1 - \boldsymbol{F}(\boldsymbol{X}_i'\beta_{j-1}) - \boldsymbol{F}(\boldsymbol{X}_i\beta_j) \quad \boldsymbol{j} = 2,..., \boldsymbol{M} - 1 \\ \boldsymbol{P}(\boldsymbol{Y}_i = \boldsymbol{M}) &= \boldsymbol{F}(\boldsymbol{X}_i\beta_{\boldsymbol{M}-1}) \end{aligned} \tag{1}$$

where β is a $K \times 1$ vector, X contains K explanatory variables, and $F(.)$ is the cumulative logistic function.

The sample analyzed consists of 268 self-reported questionnaires submitted to a sample of people attending Acquatico Bellucci circus in Alessandria (Italy), between 1 and 11 March 2007. This sample cannot be considered representative in the statistical sense of term since

characteristics of the population of circusgoers are not reported anywhere. Nevertheless, to the best of our knowledge, no data exists on circusgoers' preferences and the case study nature of the sample can be of some utility to analyze the issue of circus animals. Moreover, out of more than 100 Italian circuses, Acquatico Bellucci is one of the bigger circus [Zanola, 2009], whose spectators are likely to represent the 'standard circusgoer'. Table 1 summarizes the main statistics.

TABLE 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
anima	233	2.7555	1.0928	1	4
male	268	.4589	.4992	0	1
edu	268	.6641	.4732	0	1
young	268	.4179	.4941	0	1
freq	260	1.1231	1.1425	0	3

The dependent variable, *anima,* measures the preferences of circusgoers for circus animals. It is measured on a four-point scale with categories 1 = no preference, 2 = low preference, 3 = moderate preference, 4 = high preference. The independent variables are gender, *male*, a dummy variable which assumes value of 1 if male, 0 otherwise; education, *edu,* a dummy which assumes value of 1 if high school educated or higher, 0 otherwise; circusgoers age, *young,* a dummy which assume value of 1 if aged between 18 and 35 years old, 0 otherwise; younger than frequency, *freq,* a discrete continuous variable which registers how many times the individual went to circus within 3 years before.

3. Results

To evaluate the proportional odds assumption for the multivariate model, Brant test is performed. It indicates that the proportional odds assumption did not hold for some covariates. Hence, a generalized ordered logit model is estimated by using the GOLOGIT2 routine [Williams, 2006] in STATA 10.0. Table 2 displays results.

Although a word of caution is necessary due to the chosen comparison across categories of dependent variable which could influence results, the empirical evidence shows that covariates that we have identified play a crucial role in shaping preferences for circus animals. In fact, positive coefficients indicate that higher values on the covariate make it more likely that respondent will be in a higher category of *Y* than current one. Not surprisingly, gender is a good predictor of preferences for circus animals. Culture and age are also good predictors of preferences. Yet interestingly, the positive sign of both coefficients is not the one that we would expected. In fact, it is commonly assumed that younger and more educated people are more sensitive to animal welfare claims, whereas positive coefficients indicate that higher value of the explanatory variables increase the likelihood of being in the a higher category of preferences. For the unconstrained explanatory variable, individuals become more supportive of circus animals with increasing frequency, but the greatest effect of frequency was to push individuals towards the most extremely positive judgement.

TABLE 2. Preferences for circus animals

anima	Covariate	Coef.	Std.Dev.
1^{+}	*male*	.4100*	.24551
	edu	.5570**	.2656
	young	.5957**	.2498
	freq	.2552	.1625
	cons	.4165	.3320
2^{++}	*male*	.4100*	.2455
	edu	.5570**	.2656
	young	.5957**	.2498
	freq	.2285*	.1259
	cons	-.5904*	.3126
3^{+++}	*male*	.4100*	.2455
	edu	.5570**	.2656
	young	.5957**	.2498
	freq	.5314***	.1285
	cons	-2.3328***	-3532
Wald χ^2	28.61		
Number of Obs	230		
McFadden Pseudo R^2	.049		

+ The first panel contrasts category 1 with categories 2,3, and 4; ++ the second panel contrast category 1 and 2 with categories 3 and 4; +++ the third panel contrasts category 1, 2, and 3 with category 4. ***p<0.01, ** p<0.05, * p<0.10.

Although the analysis of the impact of a change in covariate on the response variable distribution using marginal probabilities is interesting in its own, the analysis of marginal probabilities may reveal a subtler insight. To this aim, the MFX2 routine in STATA 10.0 is used to estimate the marginal probability effects for a typical consumer, defined for every covariate by fixing the rest of the covariates at their mean (or their mode for categorial covariates). The results are summarized in Table 3.

TABLE 3. Marginal Probability Effects for Covariates

	$\frac{\partial \Pr(\boldsymbol{y}=1)}{\partial \boldsymbol{x}}$	$\frac{\partial \Pr(\boldsymbol{y}=2)}{\partial \boldsymbol{x}}$	$\frac{\partial \Pr(\boldsymbol{y}=3)}{\partial \boldsymbol{x}}$	$\frac{\partial \Pr(\boldsymbol{y}=4)}{\partial \boldsymbol{x}}$
	(1)	**(2)**	**(3)**	**(4)**
male	-.0585*	-.03681*	.0096	.0857*
	(.03495)	(.0227)	(.0090)	(.0516)
edu	-.08621**	-.0467**	0228	.1101**
	(.0442)	(.0221)	(.0177)	(.0497)
young	-.0844***	-.0532**.	.0127	.1248**
	(-0351)	(.0236)	(.0114)	(.0529)
freq	-.0369	-.0167	-.0567**	.1103***
	(.0231)	(.0245)	(.0266)	(.0263)

***p<0.01, ** p<0.05, * p<0.10

Examining Table 3, the coefficient related to being a male is negative and significantly different from zero in the models 1 and 2. In the model 4 the marginal effect shows that being a male increases the probability to register high preference for animals by 8.6 per cent. The other variables that we estimated display a profile which is nearly the same as with the gender variable. Both educated people and younger people are likely to report low preference for

circus animals in the models 1 and 2, while in the model 4 the marginal effects of being educated and young increase the probability to like circus animals. Finally, the marginal effect for the model 4 shows that being a high frequency circusgoer increases the probability to like circus animals, supporting the notion that circus animals'consumption is an experience good, for which future demand relies on the perceived value of the experience after consumption.

4. Conclusion

This paper analyzed the preferences for circus animals by individuals who attended circus. Although to our knowledge this study is the first to use micro data on circus preferences, however, we are aware that a more complete understanding of such preferences requires a nationally representative, population-based sample, unfortunately, not available at present. As a consequence, a word of caution id necessary in driving conclusions.

Empirical findings suggest some interesting insights. Higher preferences for circus animals are related to frequency of consumption. However, differently from what commonly expected, more educated and younger people seem to be less sensitive to the claims of animal welfare organizations.

The market for circus is substantial worldwide. An understanding of the characteristics of circusgoers' preferences is undoubtedly useful to circus suppliers looking to preserve and expand their markets. All together these results could be a key concern for implementing such marketing strategies.

References

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