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# Why are black South African students less likely to consider studying biological sciences?

An exploratory survey of University of Cape Town (UCT) students in mid-2019 drew attention to an important, but under-researched, question: why do conservation biology, zoology and the other biological sciences subjects struggle to attract black South African students? A large part of the answer is obviously that persisting inequalities in the schooling system make it less likely that they will meet the entrance requirements for science courses. Yet there are likely to be other reasons too, notably materialist values and aspirations (pertaining to occupation and income) as well as experience with pets and attitudes towards wildlife – all of which are likely also to be shaped by a student’s socio-economic background. Given the ‘Fallist’ protests of 2015/2016, another possibility is that wildlife conservation itself might be regarded as colonial, and students might perceive a trade-off between social justice and conservation. The survey, conducted by researchers from the Institute for Communities and Wildlife in Africa (iCWild) at UCT, explored these possibilities. The key outcome variable was whether students had ever considered studying zoology or the biological sciences, irrespective of whether or not they met the entrance requirements.

The opportunistic survey of 211 students (obtained by approaching students during the lunch break) resulted in an over-sampling of black South Africans (54% of the total compared to their share of 30% of UCT students). The results for the total sample are thus in no way ‘representative’ of UCT students. However, the data allow for some exploration of attitudinal differences between black South African students and others – and whether this correlates with ever having considered studying biological sciences.

Table 1 shows that less than one third of black South African students reported having considered studying biological sciences compared to almost half for other students. Very few students had ‘Fallist’ opinions (agreeing that conservation biology and national parks should be scrapped) – and there was no statistically significant difference between black South Africans and other students on these issues. Rather, the key differences pertained to career aspirations, attitudes towards evolution and experience with, and attitudes to, animals.

**Table 1:** Selected statistics for comparison of responses from black South African and other students

	Black South Africans	Other students	Total sample	Fisher’s exact (Pr)
Considered studying the biological sciences	32.4%	49.5%	40.3%	0.016
Agrees ‘Addressing social inequality is more important than wildlife conservation’	43.4%	31.6%	38.0%	0.087
Agrees ‘I support wildlife conservation but have no interest in having a career in it’	76.1%	60.0%	68.8%	0.016
Agrees that ‘Humans evolved from apes’	19.9%	57.1%	36.3%	0.000
Likes having starlings around at UCT	44.3%	68.0%	55.2%	0.001
Agrees that disciplines like conservation biology are colonial and should be scrapped at UCT	7.1%	3.1%	5.3%	0.199
Agrees that many of South Africa’s national parks should be scrapped and the land given to the poor	10.6%	5.3%	8.2%	0.281

Table 2 presents a set of exploratory regressions showing that attitudes were better predictors of having considered studying biological sciences than the crude indicator of being a black South African. Regression 2.1 shows that being a black South African reduced the average marginal probability of having considered biological sciences by 17 percentage points. Regression 2.2 controls also for agreeing that social inequality is more important than wildlife conservation. This reduces the average marginal probability by 14 percentage points and the effect of being a black South African remains substantial. Regression 2.3 includes whether the respondent agreed with the statement ‘I support wildlife conservation but have no interest in having a career in it’. This turned out to be the largest single determinant of whether a student considered studying biological sciences or not. Importantly, including it rendered the other variables statistically insignificant. The variable ‘black South African’ remained statistically insignificant in Regressions 2.3, 2.4 and 2.5, and when dropped (Regression 2.6) the model improves. Regression 2.6 shows that conditional on the other variables, supporting wildlife conservation but having no interest in a career in it, reduced the average marginal probability of considering biological sciences by 39 percentage points. Agreeing that humans evolved from apes increased it by 16 percentage points. Every additional type of pet ever owned increased the probability by 9 percentage points.

Table 3 shows potential attitudinal determinants of supporting wildlife conservation but having no interest in a career in it. As in the earlier analysis, the statistical significance of being a black South African disappears when these values and attitudes are controlled for. Regressions 3.2 to 3.4 include a measure of how respondents scored on the World Values Survey’s ‘materialist index’ – a set of 12 questions probing the extent to which people value economic growth and other materialist objectives over environmental objectives.<sup>1-3</sup>

Regressions 3.3 and 3.4 also include scores on an ‘anti-conservation’ (or ‘Fallist’) index which was constructed by adding the scores (taking a value of 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for agree strongly) for responses to: ‘Many of South Africa’s national parks should be scrapped and the land given to the poor’ and ‘Disciplines like conservation biology are colonial and should be scrapped at UCT’. Finally, Regression 3.4 adds a proxy variable for enjoyment or valuing of local wildlife by asking students whether they ‘like’

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**Table 2:** Exploratory regressions on ‘Considered studying zoology or the biological sciences’

Variable	Regression					
	2.1	2.2	2.3	2.4	2.5	2.6
Black South African	-0.17* (0.068) $p=0.012$	-0.16* (0.069) $p=0.020$	-0.10 (0.065) $p=0.117$	-0.04 (0.068) $p=0.584$	-0.00 (0.068) $p=0.986$	
Agrees ‘Addressing social inequality is more important than wildlife conservation’		-0.14* (0.069) $p=0.037$	-0.07 (0.066) $p=0.309$	-0.09 (0.065) $p=0.187$	-0.11 (0.065) $p=0.091$	-0.11 (0.064) $p=0.088$
Agrees ‘I support wildlife conservation but have no interest in having a career in it’			-0.41*** (0.073) $p=0.000$	-0.43*** (0.071) $p=0.000$	-0.39*** (0.074) $p=0.000$	-0.39*** (0.074) $p=0.000$
Agrees that ‘Humans evolved from apes’				0.18* (0.071) $p=0.010$	0.16* (0.071) $p=0.022$	0.16* (0.066) $p=0.013$
Number of different kinds of pets ever owned					0.09** (0.034) $p=0.007$	0.09** (0.037) $p=0.005$
Prob>chi <sup>2</sup>	0.0128	0.0048	0.000	0.000	0.000	0.000
Pseudo-R <sup>2</sup>	0.0223	0.0389	0.1474	0.1790	0.2049	0.2049
AIC	275.57	269.21	238.71	231.45	226.42	224.42
BIC	282.22	279.15	251.94	247.87	246.18	240.88

Reporting average marginal effects for the coefficients (dy/dx) \* $p<0.05$ , \*\* $p<0.01$ , \*\*\* $p<0.000$

having starlings at UCT. Redwing starlings are common on the campus and bolder individuals have been known to ‘raid’ people’s lunches. Regression 3.4 (the strongest model) shows that, conditional on the other variables, a one unit increase in the materialism scale and a one unit increase in the anti-conservation scale, both increased the average marginal probability of having no interest in a career in conservation by 5 percentage points and that liking UCT’s starlings reduced it by 28 percentage points.

**Table 3:** Exploratory regressions on ‘Supports wildlife conservation but have no interest in pursuing a career in it’

Variable	Regression			
	3.1	3.2	3.3	3.4
Black South African	0.16* (0.064) $p=0.012$	0.13 (0.068) $p=0.055$	0.11 (0.068) $p=0.105$	0.03 (0.067) $p=0.656$
Score on the World Values Survey ‘materialist index’		0.06* (0.026) $p=0.028$	0.05* (0.026) $p=0.042$	0.05* (0.024) $p=0.031$
Score on the ‘anti-conservation stance’ index			0.05** (0.021) $p=0.015$	0.05* (0.020) $p=0.010$
Likes having starlings around at UCT				-0.28*** (0.064) $p=0.000$
Prob>chi <sup>2</sup>	0.0125	0.0064	0.001	0.000
Pseudo-R <sup>2</sup>	0.0241	0.0428	0.0682	0.1560
AIC	256.14	232.04	227.36	210.68
BIC	262.81	241.80	240.35	230.16

Reporting average marginal effects for the coefficients (dy/dx) \* $p<0.05$ , \*\* $p<0.01$ , \*\*\* $p<0.00$

In short, the survey results suggest that black South African students are less likely to consider studying biological sciences than other students, and that this stance was linked primarily with career aspirations (supporting conservation but not wanting a career in it) – and these were associated with materialist values and attitudes to local wildlife.

Agreeing that ‘humans evolved from apes’ was the second biggest predictor of considering studying biological sciences, and the relatively high proportion of black South Africans who disagreed with this probably speaks to failures at school level with regard to the teaching of biological sciences and to the strength of religiosity in South Africa. We also found a strong relationship between the number of different pets owned by students and whether they had considered studying biological sciences. This variable is probably picking up attitudes towards and experience of companion animals as well as socio-economic status (pet ownership is more affordable for middle- and upper-income groups).

Materialist values (a key determinant of not desiring a career in conservation) are probably another indicator of socio-economic status as cross-national research shows that dominant social values shift from materialist to postmaterialist with economic development.<sup>2,3</sup> This suggests that black South Africans may be interested in careers other than in conservation in part because of their relatively disadvantaged backgrounds which could prime them towards considering primarily the higher-paying occupations (accountancy, law). This, together with the fact that very few students were hostile to conservation, suggests that interest in conservation as a career and in studying biological sciences might increase as the black middle-class grows.

It is worth emphasising, however, that these findings are tentative and that all the regression models left a great deal of the variation unexplained. More research is needed on potential socio-economic and cultural correlates of having considered studying biological sciences or a career in conservation biology.

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