



In defence of exploratory research: A reply to critics

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HOW TO CITE:

Natrass N. In defence of exploratory research: A reply to critics. *S Afr J Sci.* 2020; 116(special issue), Art. #8604, 36 pages. <https://doi.org/10.17159/sajs.2020/8604>

ARTICLE INCLUDES:

- Peer review
- Supplementary material

KEYWORDS:

race, wildlife conservation, materialism, social science, red-green divide

PUBLISHED:

10 July 2020

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Abstract

My Commentary ‘Why are black South African students less likely to consider studying biological sciences?’ (*S Afr J Sci.* 2020;116(5/6)) has been criticised on a variety of grounds. Many of these involve misrepresentations or misunderstandings of my research. Some appear to be rooted in hostility towards quantitative social science paradigms. Many condemn what they see as racist assumptions and interpretations. I defend my explicitly exploratory research, showing that the research design was in line with standards for such research and was rooted in well-established existing literatures. I dispute that my research was in any way racist or entailed racial essentialism. Rather, it emphasized that attitudes and beliefs were better predictors of study and career choices than self-identified racial identities *per se*. I defend the analysis of the ‘red-green divide’, materialism, attitudes to wildlife and experience of pets and attitudes on other issues. I acknowledge some useful suggestions for further and fuller research to enhance an evidence-based understanding of the challenges of transformation facing the University of Cape Town and the conservation sector more broadly.

Introduction

Reflecting at length on a two-page Commentary¹ in the *South African Journal of Science* (SAJS) is a strange experience. As critics and friends have told me, my Commentary was ‘dull’. Yet it has evoked an extraordinary volume of outrage and debate. At the last count (as of 5th July), almost sixty newspaper articles had been published criticising or defending the Commentary and/or commenting on the censorious and persecutorial reaction of my employer, the University of Cape Town (UCT).

The first substantial criticism of my Commentary came from UCT’s Black Academic Caucus (BAC). The BAC critique^{2,3} framed many subsequent responses (including several of the rebuttals published in this issue of SAJS). It was followed by my own university’s ‘Executive’ issuing an unprecedented public statement, tweeted to 207,000 ‘followers’, that named me and subjected what they called my ‘research paper’ to a detailed condemnation. Tracking media and social media suggests that the UCT statement further set the tone and frame for much of what followed. The rebuttal by Mnguni⁴ for example, condemns my paper on the basis of media reports of the statement by the UCT Executive.

The SAJS responded to the clamour by announcing, on 11th June, that it would publish a special issue to give ‘space to rebuttals in the form of social and intellectual criticism of the published work with an opportunity for response by the author’. A number of rebuttals were submitted and (apparently) all were accepted. A small number of

non-rebuttals were also submitted, despite this not being the focus of the call for the special issue. Some were published;^{5,6} others were rejected.

I now have an opportunity to respond to the rebuttals published here as well as elsewhere (including by the BAC^{2,3}). Given the diversity and length of the rebuttals, it will not be possible to answer every query, comment or criticism. I will not be addressing the UCT statement or the 'Executive's' related actions as I have discussed these elsewhere.⁷⁻¹⁰ Nor will I comment specifically on the implications for academic freedom (many others have done so¹¹⁻¹⁸). What I do here is to pull out and address the major themes that recur in the various criticisms about the Commentary itself.

The basic charge

The basic charge against my Commentary is that it is 'racist'.^{4,19} A slightly more subtle criticism is that I am unaware of my 'own biases ... and narrow-minded views of black people'.²⁰ My 'assumptions' about students were 'problematic' whilst my 'presuppositions' were 'under-examined' and 'Eurocentric or worse'.²¹ My 'presuppositions' that 'explain my conclusion... involve a set of racially charged tropes', leading to 'bad science hanging on the horns of prejudice'.²² My 'deep-seated antipathy towards the Fallist movement ... corrodes the scientific endeavour'.²² Glennon et al²³ are more indirect: My conclusions 'could serve to promote ideological assumptions that are deeply rooted in a racialised and racist history.' Rosenberg and le Grange²⁴ write that I *assume* that there are 'innate differences between ... race-based groupings.'

My 'whiteness' may or may not be part of the problem for my critics. It certainly is for Dziwa,²⁵ who describes my 'assumptions' as 'somewhat racist' and suggests that I am 'irretrievably mired in cultural bias':

Perhaps she has spent too much time in the ivory towers of academia in Cape Town with its dog running white folk on the sea-point promenade that she is out of touch. Her whiteness is

very much a factor in how she frames her problem and in how she interprets her results. ... Further, her being white and studying why black people behave in a certain way and then telling them hey this is what I have found out about you and let me explain it to you is an additional problematic that reeks of white privilege through and through. Why does she, as a white person, feel she has to explicitly study us black people, the choices we make, why we decide what we decide, and why we want what we want out of life?

I agree with criticisms⁵ of this kind of racialised demarcation of research areas.

Some critics go so far as to accuse me of deceit. Mothapo et al.²⁰ suggest that I submitted my piece as a Commentary in order 'to hinder and avoid critical examination of their research as well as to prevent open and objective discourse about the validity of the findings with the wider research community'.

It is difficult to disprove allegations about assumptions, presuppositions and intentions. Below, I argue that there was nothing racist about my assumptions or presuppositions and I explain my intentions. I argue further that neither the questions in my survey nor my analysis of the data invokes racist stereotypes or tropes, as critics have asserted or implied.

Several critics invoke the spectre of my research having the (possibly unintended) effect of bolstering racism. I think that it was the BAC² that first suggested that my Commentary in the SAJS might galvanise white supremacists. Others have followed: My findings 'lend themselves to racist interpretations' and 'runs the risk of producing racist knowledge'.²¹ 'There is a plausible risk that the commentary could be used to further bolster racist arguments, racial insensitivity, used in a manner to perpetuate harmful racist stereotypes' and undermine transformation.²³ I cannot address this anxiety, but I find it implausible that a dull, two-page commentary in the SAJS will have such wider repercussions.

Some of my critics make bold statements that are simply wrong. Dziwa,²⁵ for example, writes that I ‘asserted that the paper had been cleared by UCT Executives’. I have never asserted this, although I have pointed out that the Deputy Vice-Chancellor for Research, who apparently took the lead in drafting the UCT statement about the Commentary, had chaired a meeting where I presented my findings, and had not raised any criticisms at the time.^{7,10} I will not be correcting all such errors.

Also commonplace in the ‘rebuttals’ are misunderstandings and misrepresentations of my research, especially from critics who appear not to understand or appreciate quantitative social science. Several critics allege that I examine attitudes and then ‘racialise’²¹ the responses and that my explanations are ‘race-based’. As I show below, the opposite is true: I use attitudes to *deracialise* responses. I shall address this further below. I shall try to explain clearly – for non-social scientists – what my regression models show.

Many of my critics charge me – explicitly or implicitly – with the crime of racial essentialism. For example, Mzilikazi et al¹⁹ assert that the Commentary ‘depicts and frames a whole racial grouping as largely governed by materialism, linked to a poor relationship with nature and pets’. Firstly, the Commentary was clear about the sample not being representative and hence that findings could not be generalized to UCT students let alone a ‘whole racial grouping’. Secondly, the charge itself reflects a misunderstanding of what racial essentialism looks like. A statement such as ‘coloured women are both unintelligent and unhealthy’ (which is a summary of the controversial and retracted 2019 Stellenbosch paper – see Jansen²⁶) seems to me to be an example of racial essentialism, in that it apparently endorses the unity of ‘coloured women’ as a racial group and associates an ‘essential’ set of physical or mental characteristics to this group.

Many critics have tried to shoe-horn me into some kind of race science box by assuming that

I view ‘black South Africans’ as a ‘racial group’ and that I proceeded to associate this group with an ‘essential’ set of attitudes and beliefs. I dispute that I do either of these things. As I discuss below, I framed my Commentary in terms of ‘black South Africans’ not because I accord the group any natural status but because this distinction is relevant for transformation. Nor do I identify any ‘essential’ attitudes or beliefs. Rather, I show that a set of attitudes, each of which is likely to shape study and career choices, cut across self-identified racial categories and differ within racial categories. The fact that combinations of these attitudes and beliefs were more prevalent among black South Africans than others helps us to understand why black South African students in my sample were less likely to have considered studying biological sciences or to want careers in wildlife conservation. In showing that attitudes and beliefs are better predictors than self-identified racial identities *per se*, I provide a deracialized explanation for an outcome that initially appears to be partially racialized.

Many of the rebuttals in this volume comment on the limitations of my sample and statistical analysis. I accept some of these criticisms – and acknowledged them in the Commentary itself. The research I reported was explicitly exploratory. The Commentary also acknowledges the weakness of the overall models in that much of the variation in my dependent variables is left unexplained. Exploratory research is not equivalent to predictive or confirmatory research (see Swedberg²⁷). Many of my critics ignore or skirt this distinction, either criticising me for having conducted (in their account) predictive and confirmatory research on a non-representative sample, or taking issue with the fact that I published the results of exploratory research at all.

In this response to my critics, I first discuss the meaning of exploratory research. I then turn to the challenge of transformation that prompted me to publish the Commentary. I consider further the title and the context. I then discuss the research design, including specifically the value of quantitative social science, the sample, and the selection of questions. I

examine the questions asked of respondents, the variables used in my analysis and the interpretation of the relationships identified in my regression models, with respect to materialism and economic incentives, the 'red-green divide' (i.e. the relative ranking of social and conservation concerns), attitudes towards wildlife and pets, and other attitudes. I show that all of my variables were rooted in well-established social science literatures. I question whether any of these reproduce racial tropes or stereotypes.

I can do little about the offence that my Commentary might have caused other than to record my regret that it did so. But I can and do defend my exploratory research and published Commentary as acceptable social science.

Exploratory research

Exploratory research entails a wide range of methods, and there are debates over which are best and most appropriate (see discussion in Swedberg²⁷ and Nilsen et al.²⁸). Methods are messy, results are tentative, but there is general agreement that exploratory research is an important component of scientific endeavour especially when it comes to understanding society. John Dollard, in his book *Caste and Class in a Southern Town*, which is one of the early flawed yet classic explorations of race in America, had the following to say in the preface:

I would not have the reader think that I believe this book to be a good example of scientific work in its best and terminal form. I see it rather as an exploratory work of science, of the fumbling and fiddling out of which more authoritative descriptions of reality will emerge. I wish I could be certain that we would have the time for a final scientific description of our society before we shall be called to account for its disastrous imperfections.^{29.p.xiv}

Critics of my methodology should read my Commentary in this light. The reason I published my results as a Commentary, rather than a full research article, was to flag their

exploratory nature. I called explicitly for further research into what is clearly an important challenge: transformation at the university and within conservation. I believed that reporting my exploratory research was in line with the SAJS's guidelines for commentaries, and indeed for commentaries in academic journals generally (see further discussion of this by the anonymous student in Appendix A). My Commentary was in fact submitted and accepted for publication with the subtitle 'An Exploratory Analysis'; the subtitle disappeared during production (which I failed to notice).

Most exploratory research is not designed to be published.²⁷ This was true of my research. The motivation behind the survey I analysed in the Commentary was to collect data on various aspects of living with wildlife at UCT and on student preferences and attitudes pertaining to study and career choices relevant to conservation. The survey was intended primarily to support student projects and to inform ongoing discussions in the Institute for Communities and Wildlife in Africa (iCWild) about transformation.

The challenge of transformation

Transformation in South Africa relies on 'racial' categories inherited from the apartheid era and re-institutionalised by the post-apartheid state.³⁰ Government has the power to give social life to categories and the dangers of this approach are frequently pointed out.³⁰⁻³² The South African government Department of Higher Education and Training demands that institutions report (on transformation) using old apartheid racial categories. This prolongs the life of these outdated racial categories even though it also reminds us of the long-historical reach of racial discrimination. At UCT these categories are also national in that a distinction is drawn between South Africans and people from the rest of the world.

I am part of iCWild, a relatively new inter-disciplinary institute at UCT committed to problem-driven, often action-oriented, policy-relevant research. We accept students from all over the world without prejudice. We are also

committed to UCT's overall project of transformation and to growing the number of black South African researchers and practitioners in the broad field of conservation biology. Scholars who are not white and middle-class are likely to have insights rooted in different cultural backgrounds and values³³⁻³⁵ and are also more likely to understand and to be able to engage effectively with many of the communities living in closest proximity with wildlife across Southern Africa. I look forward to having a more diverse set of senior colleagues in the fields in which I work.

Senior courses in the Biological Sciences Department are important feeders for post-graduate research in Conservation Biology. The Department of Biological Sciences does not have readily available data on the number of black South Africans in the undergraduate or postgraduate degrees, but it is widely acknowledged in the department that black South Africans are under-represented (see Midgley⁶). The current Head of Department commented in an email (4th June) that there were black South African students in first year classes but 'the numbers decrease as one moves to senior courses.' This year there were no black South Africans in the Masters' course in Conservation Biology. In iCWild we have been successful at improving the diversity of our student cohort, but we struggle to grow the number of black South African scholars.

In my Commentary I analysed survey data to see if we could learn anything about how attitudes and preferences might shape individual study and career choices in a sample of UCT students. Of course, the survey barely scratched the surface of the many factors that probably shape preferences and choices. Of course, a two-page Commentary could only mention in passing, rather than expand on in any detail, the socio-economic, and institutional forces, as well as the legacy of apartheid, that shape and constrain the context within which individual choices are made. Yet the exploratory research produced some suggestive and interesting results. I presented these at the three-year institutional review of iCWild and was encouraged by both

external reviewers to publish the results. This is why I submitted the Commentary to the SAJS. I agreed with the external reviewers that the challenge of transformation is so complex and multi-faceted that we should be sharing even our exploratory results where these perhaps shed light on this important, yet under-explored, topic.

Transformation is not only a challenge at UCT, but also for the conservation sector across South Africa. A 2010 report on 'A Human Capital Development Strategy for the Biodiversity Sector: 2010-2030', by SANBI and the Lewis Foundation,³⁶ showed that black South Africans were under-represented in leadership and senior levels in their broadly defined 'biodiversity sector'. Factors thought to be associated with this included absolute shortages of suitably skilled black South African graduates, non-competitive salaries and the quality of education in schools attended by the majority of black South Africans. The report noted that the percentage of black South Africans working in the biodiversity sector increased between 2000 and 2007, but that it still fell short of its equity target. Worryingly, more than 30 percent of people working in the sector were reportedly not qualified to take on the responsibilities for which they had been appointed, leading to a presumed need to attract suitably qualified post-graduates from elsewhere in Africa and the world. The report included data from the Higher Education Management Information System (HEMIS) for a broadly defined 'biodiversity' cluster, which included biological sciences, horticulture, soil sciences, geography and agricultural extension. It found that the number of black graduates grew in the 2000s, but that the challenge of producing more post-graduates remained pressing.

Some of my critics seem to believe that there is no longer a problem of transformation in either the biological sciences or the conservation sector (and hence, by implication, my research was misguided and unnecessary). Glennon et al²³ conclude that the problem does not exist because the number of black South Africans studying

biology at Wits has grown. Mzilikazi et al¹⁹ similarly report that there is no problem at the University of Johannesburg (UJ). Rosenberg and le Grange²⁴ suggest, citing unpublished analysis of more recent data from HEMIS, that transformation has gained pace in the broadly defined biodiversity sector, but they provide no data specifically on black South Africans in the biological sciences, or in conservation biology, or in conservation careers. (They also say their definition of black was ‘politically defined’ but do not explain what this means).

It was gratifying to read (in Mzilikazi et al¹⁹) that UJ and some other institutions have successfully attracted more diverse students into biological sciences. We can surely learn from their successes. As Mzilikazi et al¹⁹ proceed to acknowledge, however, ‘there is a clear lack of transformation in biological sciences at many of our top universities’, i.e. not only at UCT. I note also that neither Mzilikazi et al nor any of my other critics point to a single prior study of either this ‘clear lack of transformation’ at ‘many of our top universities’ or the successes at UJ and elsewhere. Mzilikazi et al¹⁹ proceed to suggest that what we need are more inspirational role models, better science teaching in schools and more resources for study at university. I agree with Mzilikazi et al¹⁹ on this; including questions about role models in my survey might have been useful. But would these reforms suffice? Mzilikazi et al¹⁹ provide no evidence that the factors I identified among UCT students are not *also* important.

Haffajee^{37,38} reports that 13 out of South Africa’s 20 national parks are managed by black South Africans and that many of the senior scientists at South African National Parks (SANParks) are black. She concludes that the entire premise of my research would have fallen over if I had made ‘one phone call to SANParks’. Yet in her own interview with him, the managing executive for conservation services at SANParks (Luthando Dziba) noted that ‘more needs to be done to achieve the transformation of the conservation sector as a whole, including within SANParks’ and that progress to date has been ‘rather modest’.³⁸

Many people from across the conservation sector have written to me making the same point: Despite progress, more needs to be done.

The title and context

The title of my Commentary seems to have been a source of some confusion. For example, Glennon et al²³ read it incorrectly as implying that ‘black students are *not* studying biological sciences’. Others have ignored the question mark and read it as making a generalizing claim (e.g. Rosenberg and le Grange²⁴). The title of my Commentary posed a question: ‘Why are black South African students less likely to consider studying biological sciences?’ The ‘less likely’ is important and speaks directly to the *marginal effects* reported in my Commentary (more on this later). I accept, though, that not stating in the title that it was an ‘An exploratory analysis’ may have caused confusion and it is unfortunate that this subtitle got dropped during production.

In reflecting on titles and potential misunderstandings about generalization, it is useful to consider another paper on student attitudes at UCT. Shose Kessi (who was subsequently appointed Dean of Humanities) co-authored a research article titled: ‘Coming to UCT: Black students, transformation and discourses of race’³⁹. The title of this paper is clearly more generalising than my own. The paper provides a fascinating analysis of comments and photographs by 24 students who participated in a transformative ‘photovoice’ project. The sample appears to have been a convenience sample (perhaps even a snowball sample). Nonetheless, the article concludes with a generalization: ‘Despite the increasing numbers of black students at UCT, their sense of belonging to the university remains limited.’^{39,p.12}

Why is it that my Commentary, with a more qualified title and an explicit statement in the text that the data are not representative across UCT, has been read as making generalizations about ‘black students’, when the Kessi and Cornell research article, which makes an explicit generalization based on a sample that

clearly cannot be used to make generalizations, did not generate outrage?

I prefer evidence to speculation, but do need to consider briefly the political and intellectual context of identity politics. Identity politics has generated movements such as Black Lives Matter and #MeToo. It has noble origins in the black feminist lesbian movement that found expression in the Combahee River Collective⁴⁰ which argued that the most radical politics was rooted in identity issues rather than working to end somebody else's oppression. An effect of this approach has been to privilege identity over other factors, to enable reductionism and essentialism (where a claimed identity must result in certain views) and to produce intolerance and incivility in South African academia.⁴¹ An identity politics approach permits my detractors to position me, first and foremost, as a white author and once this racial identity has been asserted it becomes legitimate to condemn me for subjecting 'black lives' to a hostile 'white gaze'.

Another possible reason for the torrent of criticism on social media is that the focus of the Commentary was on student preferences and choices rather than on institutional racism. Kessi and Cornell³⁹, it would seem, can – and without provoking outrage – make generalizations (and on limited evidence) about what black students feel about UCT because such generalization are in line with what has become a hegemonic framing of UCT in terms of institutional racism and white privilege. This framing represents black (South African) students as marginalised (and even humiliated) by unsafe academic spaces dominated by white professors teaching colonial subjects of little relevance to them.⁴¹⁻⁴⁵ My Commentary may have offended in part because it seems to be paying insufficient attention to the institutional context within which students make choices.

The hegemonic framing of UCT as institutionally racist has provoked much needed discussion. But it has also resulted in a hostile environment for those seen to be on the wrong side.⁴⁶⁻⁴⁸ Many students and

academics have written to me to say that they were concerned (even appalled) by the attacks on me and the Commentary but were reluctant to say anything publicly for fear of reprisals. One of these students attempted to publish a rebuttal of the BAC's criticisms of me but was apparently turned down by the SAJS for being anonymous. I have taken the step of including it as Appendix A because it stands as an example of the many voices that have been silenced in this furore.

The narratives and images discussed by Kessi and Cornell³⁹ provide insights into how some (perhaps many) students experience racism and alienation on campus. Survey research into patterns of social segregation at UCT and other universities^{49,50} is also revealing of the continued salience of race in everyday life. Yet there are clearly many factors shaping student choices and experiences that transcend race, and this too is a vitally important area of study.

Student choice and agency

If we are considering access into and progress through higher education in general, then we know – from numerous studies – that students are constrained by socio-economic factors: poverty, poor schools and the racialised legacy of apartheid. There are huge structural barriers to most young people realizing their aspirations.⁵¹⁻⁵³ Access to higher education and the likelihood of completion of diplomas or degrees are affected by class background.^{51,54-57} School students might be told 'you can do anything'⁵⁸ but of course they face very unequal opportunities.

What we don't know much about is how students make choices – and exercise agency – within the structural constraints. A 2002 study analysed high school students' subject choices (as well as institutional preferences), finding that the most important factors were interest, wanting to make a difference, and job opportunities.⁵⁹ More recent studies emphasise the pressure that is placed on younger people, especially by adults challenged by structural disadvantage, to obtain an education that can pave the way to a 'lucrative' career.⁵³ Research in a KZN high school suggest

that career choices are often driven by the anticipated financial rewards (i.e. being paid a 'huge salary', as one student put it).⁶⁰ School students in Cape Town, when asked about their career aspirations, almost all said that they wanted to be lawyers, doctors or successful in business⁵¹.

There are, to the best of my knowledge, few studies on career choices of university students in South Africa, particularly where this is of direct relevance for conservation. The SANBI/Lewis Foundation report³⁶ into the challenge of transformation in the biodiversity sector noted that values and attitudes were probably important factors shaping subject choice and thus also the entire pipeline into the biodiversity sector.^{36, p.11,16,41} Abrahams et al,⁶¹ using data from a survey of students at a historically disadvantaged university, found that 'anticipated benefits influenced the students' career choice, with the potential for personal growth and development, for future high earnings and for promotion to the top of the organization being the most important. In reviewing the available studies, the authors concluded that there are many variables – including 'socio-cultural factors' and family role models – affected career choices of students, but that job opportunities also featured prominently.^{61 p.211}

Given this prior research, it seemed appropriate to start exploring preferences amongst UCT students with regard to subject areas and careers of relevance to conservation. These are students who had the necessary qualifications and access to resources to study at UCT. Within this sample, attitudes and beliefs are likely to be more important than direct structural constraints – although attitudes and beliefs themselves are, of course, rooted in broader cultural contexts beyond the control of any individual student. My UCT-based critics,^{21,62} however, reject my research in part because it focuses on student preferences and choices rather than the wider context of history, institutional mechanisms of exclusion, ongoing socio-economic inequality and so on. Dziwa²⁵ seems to make a similar claim, that the study of transformation should

be 'approached ... from an institutional, demand-side perspective'. I disagree. Student choice and agency are *also* valid topics for research and should be part of our ongoing discussion about transformation.

The idea that students make choices seems to offend some of my critics, many of whom seem to imagine that young people are simply the victims of structural forces beyond their control. Yes, as I and others have shown elsewhere,^{51,63-65} many young people face highly constrained choices in life. The legacy of the past weighs heavily on young people through the inequalities in schooling, social networks, the labour market and so on. Nonetheless, young people make choices and exercise agency – as, of course, was demonstrated through their resistance to apartheid.

A series of studies, using qualitative research, have pointed to the 'resilience' exercised by young people in navigating through a 'structural' landscape that constrains but does not prevent their agency.^{51,53,66-70} There is also a long literature on the ways in which agency in South African history has been shaped by norms, values and beliefs. One example of this that is very relevant to educational decision-making is the rich ethnography and historiography around 'red' and 'school' traditions in the Eastern Cape.⁷¹⁻⁷³ Memoirs by scholars such as Chabani Manganyi⁷⁴ and Mamphela Ramphele⁷⁵ provide life history examples of agency and choice, speaking eloquently about race, social class and family, and how individuals exercised choice within the bounds of 'fate'.

Paradigmatic intolerance and misunderstanding

Another source of misunderstanding of, and hostility towards, my Commentary, particularly from those outside of the social sciences, is about the nature of survey research and how analytical findings should be interpreted and read. Survey data analysis necessarily abstracts from the complexity of individual lives, does not speak easily or directly to historical and social context and is

limited by the inevitably crude character of standardised questions. Many scholars in the Humanities prefer qualitative methods over survey research. Some of the criticisms of my methods thus reflect the divide between scholars in qualitative, ethnographic, participatory or discursive traditions and the social sciences, where the analysis of survey data is undertaken to produce summary statistics and to explore patterns and connections in the data using techniques including factor and regression analysis. Ross,²¹ for example, dismisses my survey research as ‘methodological individualism’. Khan and Alves⁶² dismiss it as an unacceptable Western research method. Both assert that it is therefore ‘racist’.

This methodological hostility towards quantitative methods is particularly evident in debates over transformation and how to study it. In the introduction to their recent edited collection: *Transforming Research Methods for the Social Sciences: Case studies from South Africa*, Laher and Kramer note that the reviewers of the book manuscript had questioned the inclusion of quantitative and experimental methods, to which they had responded: ‘We stand firm that all methods have value’ and ‘cannot support a narrow view of what exactly constitutes transformative methods in contexts like ours.’^{76, p.10} I agree.

Another (related) part of the problem is that many critics appear to have focused on the descriptive statistics rather than the regression analysis which reported average marginal effects of what can be understood broadly as conditional correlations. The descriptive statistics, which were included to show how the distribution of the attitudinal variables used in the regression analysis varied between students who self-identified as ‘black South African’ and all other students (i.e., other self-identified categories of South Africans, or foreign students including from African countries). I presented the breakdown in this binary way (‘black South African’ versus all others) because of the focus on transformation, and because it was the variable used in the subsequent regression analysis.

Some of my critics worry that I do not have a ‘control group’ in the analysis. In some cases, I think this is a misunderstanding of how the use of binary variables works in multiple regression. Consider my initial dependent variable: students who had considered studying biological sciences have the value 1 for this variable; students who had not considered it have a value of 0, and thus serve as the ‘control’. Other critics seem to be arguing that I should have controlled in the regressions for what faculty students are in, or for whether they were actually doing biological sciences. The key outcome variable used in my exploratory analysis was whether students had ever considered studying biological sciences – irrespective of whether they actually were studying biological sciences. There was no obvious or necessary reason to control for faculty or actual subject choice in this exploratory research, though I accept that this would be an interesting thing to explore in future research on a larger, probabilistic sample.

A note on ethical approval and causing offense

The data used in my Commentary drew on an exploratory survey of living with wildlife at UCT (discussed further below). The questionnaire and sampling method obtained ethics approval through the Commerce Faculty (where I have a permanent academic appointment), in line with university policy.

There has been much confusion amongst my critics about whether ethical approval was granted for my research. In social survey research, ethical approval is granted for the data collection, not for the ensuing research papers using the data. There are potentially many different research papers that can be written on data from a single social survey so there can be no reasonable expectation that the full range of possible papers be presented for ethical clearance at the time that a social survey instrument is cleared. Furthermore, papers in the social sciences are not ‘cleared’ by a committee dedicated to ensuring that no ‘offensive’ papers are published (as seems to be the demand of many of my critics).

This is for good reason. If censorship of this kind had been introduced in the 2000s, it probably would have prevented the publication of all of my work on AIDS denialism, including my estimation of the number of people who died unnecessarily because of the delayed use of antiretrovirals.⁷⁷⁻⁸¹ During that time, I caused great offense to the South African president and his health minister. I was pushed off an academic platform for daring to suggest the Health Minister was mistaken. Some colleagues in the Humanities believed I was being offensive for dismissing ‘African science’, not giving sufficient attention to ‘alternative knowledges’ and paying too little attention to ‘subaltern voices’. There is no question that I outraged some people and that my work ‘harmed’ President Mbeki and his Health Minister. My research was used in the Treatment Action Campaign’s successful legal action that forced the government to provide antiretroviral drugs through the public sector to prevent the transmission of HIV from mother to child. My work was offensive, but it helped to save lives. When I look back over my academic life, I am sure that this will be the work I will be most proud of.

My exploratory Commentary, by contrast, will barely be remembered beyond the fuss it has caused. Yet it too deserves not to be censored just because some people have read it as being offensive.

The sample

In my Commentary, I described the sample as ‘opportunistic’ as I left it up to the student researchers to approach respondents, which they did mostly during the lunch break. Describing the sample as ‘opportunistic’ is unusually honest for social science survey-based research. Samples of this kind are more usually described as ‘purposive’ or ‘convenience’ samples. In the social sciences, samples are often far from perfect, with ‘purposive’ or ‘convenience’ features.

A recent example is the web-based survey that StatsSA conducted during the lockdown to explore the impact of COVID-19 on income and employment.⁸² StatsSA was explicit about the

fact this was a convenience non-probabilistic sample which meant that findings could not be generalized across South Africa. Yet, the data were analysed and published because the information is clearly of interest and better than nothing when it comes to informing policy making.

For some of my critics, using data from a non-representative survey to reflect on preferences pertaining to studying biological sciences and a career in conservation was simply ‘bad science’ (and, some added, unethical). I accept that a larger, more representative sample would have been better, but I do not accept the charge that what I did was unacceptable social science. As discussed earlier, exploratory research and the testing of novel hypotheses and/or the trialling of unusual and innovative (some have called them quirky or even bizarre) questions is a very common component of scientific endeavour. This is especially the case with under-researched topics. In our case, we sought to obtain a sufficiently large and diverse sample of students to explore whether particular questions resulted in sufficient variation across the sample that they could be useful for regression analysis – and then to explore correlations and other statistical relationships between variables.

Data from non-probabilistic samples commonly form the basis of empirical research within the social sciences. This is true for diverse research methods, ranging from ethnographic description, to case studies, experimental design, action-research interventions (such as the photovoice intervention discussed in Kessi and Cornell³⁹) and social surveys. Qualitative studies in particular have a very loose approach to sampling. For example, a study of career choice in a South African township school invited 47 students to participate; 12 did so; the ensuing sample was described as ‘purposive’.⁸³ Kessi and Cornell³⁹ used some kind of convenience or snowball sample. A study based on 20 high-school learners participating in focus groups described this as a ‘convenience sample’, and despite this not being representative,

concluded on the basis of this evidence that the 'career counselling needs of Black learners in rural schools still go unmet'.^{60, p.260} Cocks et al, for their study of understandings of nature amongst Xhosa-speaking people in the Eastern Cape conducted a non-random 'purposeful sample' aimed at 'representing a spread of economic status, age, and gender'.^{35, p.827}

Adesina²² is particularly critical of my opportunistic sampling frame. He suggests that even exploratory research should have used a systematic, probabilistic sampling frame, using student records. This, of course, is but one of several possible ways of drawing a representative survey sample.^{84,85} Mzilakazi et al¹⁹ concede that convenience samples are appropriate in 'many situations,' but concur with Adesina that I should have drawn a random sample using student records. This is like saying that, if we want to go on an exploratory drive, we need to drive a Rolls Royce. Adesina seems ignorant of the facts that Rolls Royces are not only expensive but can easily turn out to be inappropriate. In South Africa, survey response rates among students (and some other sections of the population) are generally low and almost certainly non-random. In reality, social scientists typically make do with imperfectly realised samples and then have to consider how to interpret our findings. Sometimes it is better to drive a jalopy and be honest about it.

Even if we had chosen to draw a probabilistic sample of the kind suggested by Adesina, and then emailed the questionnaire to the selected students, it would likely have suffered from such selection bias that even judicious weighting of the sample could not 'correct' for it. In contrast with face-to-face interviews, which provide respondents with the opportunity to discuss the research and the questions posed,⁸⁶ students are likely to see the email as spam, and lacking any context, be prone to rejecting the survey as a waste of time. One could, of course, provide incentives to students in order to encourage participation but, this cannot be relied on to solve the problem. For example, Finchilescu et al⁴⁹ surveyed students across four South African

universities in a mass emailing, and via adverts at login, offering students the opportunity to enter a draw for a R1,000 prize if they participated. The authors did not specify how many students they reached (they might well have not known) but it is likely to be in the tens of thousands. Their final sample was 2,559 students, of which 59% were white and 61% were women. Their sample clearly suffered from selection bias and cannot be considered representative. In a later paper based on the same data set, Tredoux and Finchilescu⁵⁰ acknowledge explicitly that the realised sample was unrepresentative and non-probabilistic.^{50, p.294}

Does this mean that they should not have done any statistical analysis on the sample, and that the two interesting papers^{49,50} based on this data should not have been written or published? According to critics such as Glennon et al,²³ the answer is a firm 'yes' because, they believe, one simply cannot run any probabilistic statistical analysis on a non-random sample. Perhaps this is because they are zoologists and botanists. Social scientists are much more comfortable working with data sets that are far from perfectly random or representative. This is what happens when you work with human actors who can exercise choice and decline to participate. For social scientists, including Tredoux and Finchilescu,⁵⁰ it is acceptable to explore how patterns of answers in non-representative surveys regarding attitudes and preferences overlap with race. As they explain, the key issue was that despite being unrepresentative, 'there was considerable diversity within the sample, and it was considered suitable to our primary purpose of exploring the potentially mediating effect of a number of variables on the contact-prejudice relation'^{50, p.294} This was precisely the approach adopted in my survey and exploratory analysis.

My students and I opted for a directly personal approach where students were offered the opportunity to participate in a short survey primarily during lunchtime, when wildlife like starlings and pigeons were very much in evidence, and when UCT's many rodent bait

stations could be pointed out and discussed. I am convinced that this resulted in better response rates and more meaningful discussions and participation. Our face-to-face friendly approach also included giving students a snack bar in appreciation of their time. The snack bars, together with the short and somewhat quirky nature of the survey, meant that demand for participation at times exceeded our supply of snack bars and questionnaires. My student researchers had no problem obtaining interviews. I also had no reports of any student being offended by any of our questions.

Some of my critics have argued that instead of obtaining this sample of students, I should instead have started with surveying (or interviewing in-depth) a sample of students in the biological sciences. It is likely that this would reveal the factors that shape the decision to study biological sciences. I hope someone does this research. I disagree, though, that such research had to be done *before* doing my exploratory survey with a wider mix of students. I am told by colleagues in Biological Sciences that despite more than 20 years of discussing the failure to transform biological sciences the department as a whole has to date relied solely on discussions within staff and student meetings to try and understand and resolve the problem, evidently with very limited success.

The analytical strategy

The analytical strategy in the Commentary focused on two questions of interest to iCWild when considering the challenge of transformation: were black South African students in our sample less likely to have considered studying zoology or any other biological sciences, and were they more likely to agree with the statement 'I support wildlife conservation but have no interest in a career in it'. If we observed a 'race effect' in these questions, could the outcomes be better explained by attitudinal variables? There was no assumption that 'race' mattered and, if it appeared to do so, the challenge was to explain how and why.

Given that there has been such widespread misrepresentation and misunderstanding of my analytical strategy, it is worth explaining it in some detail. My regression results reported average marginal effects. In each case, I started with a simple (bivariate) regression which had a single explanatory or independent variable which took a value of 1 for students who self-identified as black South Africans, and zero for other students. Regression 2.1 shows that being a black South African reduced the average marginal probability of having considered biological sciences by 17 percentage points. This is not a huge effect. It certainly does not mean that no black South African students at UCT had considered studying biological sciences. Nor can this statement be considered to be a general statement about all black South African students either at UCT or across the entire country (as many of my critics insist my paper was suggesting). It merely shows that, in this sample of UCT students, self-identification as black South African reduced the probability that a respondent would agree that they had ever considered studying biological sciences.

The other regressions in Table 2 were multivariate regressions, that is they included further (in this case, attitudinal) independent variables. Regression 2.2 includes the attitudinal binary variable taking a value of 1 if respondents agreed with the statement 'Addressing social inequality is more important than wildlife conservation' and zero if they disagreed or neither agreed nor disagreed. This binary explanatory variable also had a statistically significant, negative relationship with the dependent variable. In Regression 2.2, the 'black South African' binary variable remained statistically significant and its coefficient only declined slightly: conditional on the other variables in the model, agreeing that addressing social inequality is more important than wildlife conservation reduced the average marginal probability of having considered the biological sciences by 14 percentage points, and self-identifying as black South African reduced it by 16 percentage points. Regression 2.3 added a further binary

variable taking the value of 1 if the student respondent agreed with the statement 'I support wildlife conservation but have no interest in a career in it' and zero for those who disagreed or neither agreed nor disagreed. Including this binary variable reduced the size effect of self-identifying as black South African and rendered it and the other variable statistically insignificant.

In other words, what we are learning here is that, conditional on the other variables in the regression, agreeing with the statement 'I support wildlife conservation but have no interest in having a career in it' reduced the average marginal probability of having considered studying the biological sciences by 41 percentage points. This is a large effect that overwhelmed the effect of 'race' in the initial regression on this sample of students. The size effect of the binary variable taking the value of 1 if respondents agreed with 'I support wildlife conservation but have no interest in a career in it' remained large and statistically significant even after controlling for attitudes towards human evolution and extent of experience with different kinds of companion animals (more about these variables later).

To reiterate: my results show that attitudes were a better predictor than 'race' (or more precisely, racial and national identity) – and this is what I wrote in the Commentary. This is not racist analysis – it is precisely the opposite.

Some of my critics have fundamentally misunderstood, and I would suggest misconstrued, my empirical strategy. Notably, Glennon et al,²³ and Adesina²² seem to think that I started out with racist assumptions, made racialised 'findings' and then failed to appreciate the logic of my own analysis (that the effect of race disappears when other explanatory variables are included). They use exclamation marks and bolded text, giving the strong impression they think they have made some amazing discovery about my own results which I was presumably too blind to see. I am totally perplexed by this misreading of my Commentary. It speaks volumes about their own blindness to what I actually wrote, and

how wrapped up they must have been in their own indignation about what they thought was my racism, that they could not, or would not, acknowledge what was actually set out in the two pages comprising my Commentary.

Given that agreeing with the statement 'I support wildlife conservation but have no interest in having a career in it' had by far the largest impact, I took the further analytical step of exploring potential determinants of this attitude. This entailed selecting questions about wildlife, about the perceived validity of the conservation project itself, and indicators of materialist values which could reasonably be considered of relevance to career choice. Table 3 presented a set of regressions showing that the score on the World Values Survey materialism index and the score on an anti-conservation index were positively, but weakly, associated with the dependent variable, whereas a positive attitude to local wildlife (the red-wing starling) at UCT was negatively, and more substantively associated with it.

Glennon et al²³ reject this analytical strategy in its entirety, saying that what I should have done was use only the best fit models (derived from all variables). This probably speaks in part to differences between natural and social sciences, and to their likely lack of familiarity with the range of analytical approaches adopted in analysing social survey data. A key strategy in the Commentary was to show how the inclusion of attitudinal and other variables 'got rid of' an apparent 'race effect'. The point of showing a succession of regressions was precisely to demonstrate this for the reader.

The strategy of first reporting descriptive statistics for variables and then the results of regressions where each control variable is included for theoretical reasons, is a common strategy in the analysis of survey data in economics (see e.g. Henry and Kollamparambil⁸⁷ for a recent example using South African data). Variables are not included just because, in some data mining sense, they are the 'best fit'. Variables are rather selected for inclusion because it is meaningful to do so and in order

to draw particular implications, such as saying ‘controlling for occupation, education, skills and experience, people who are female, or black, or have a higher body mass index, are paid x percent less than expected’. In my Commentary, the regressions were set up to show that there was a simple relationship between being a black South African and the variable of interest, but that this relationship lost substantive and statistical significance once our attitudinal variables of interest were included in a multiple regression.

This strategy of showing the simple regression and then adding additional variables in subsequent regressions was similar that used in a recent co-authored paper on the relationship between culling predators and livestock losses the following year in the South African Karoo (see Natrass and Conradie,^{88,p.781}, and Natrass et al.^{89, p.1227} This approach is common in economics. The only economist I am aware of amongst the authors included in this special issue is Hassan Essop, and as he and Long⁵ point out, they were not offended by the Commentary. They, like many others (including me) point to limitations with the sample but are clear that the results of regression analysis should not be read as assumptions.

Were the questions in the survey (and my subsequent analysis of the data) racist and designed to put black South Africans in a bad light as some of my critics contend? Are they, as the BAC claimed, ‘based on historically fictionalised stereotypes about black people conjured in “the white imagination”² that are harmful by intent (and empirical outcome)? A first step towards addressing this entails discussion of the questions themselves, reflecting on the logic (and analytical intent) behind them, and on whether there are any grounds for believing that these are based on harmful stereotypes. I shall discuss the questions in two groups: the first pertains to the ‘red/green’ divide; the second pertains to general attitudes and values and experience with companion animals.

The Red/Green Divide

Four questions were included in the survey because they speak to the ‘red/green’ divide that is evident inside and outside of the academy. Students were presented with a set of statements and they could choose a response on a Likert scale ranging from ‘agree strongly’, ‘agree’, ‘neither agree nor disagree’, ‘disagree’ or ‘disagree strongly’. For the purposes of the analysis in the Commentary I created binary variables out of a non-binary set of responses where ‘agree’ and ‘agree strongly’ were coded as 1 and other responses as zero. The statements presented to students were as follows:

1. ‘Addressing social inequality is more important than wildlife conservation’.
2. ‘I support wildlife conservation but have no interest in having a career in it’
3. ‘Many of South Africa’s national parks should be scrapped and the land given to the poor’
4. ‘Disciplines like conservation biology are colonial and should be scrapped at UCT’

Ross²¹ suggests that question 1 above sets up a ‘false dichotomy between social justice and environmental conservation’ (see also Haffajee^{37,38}). Rosenberg and le Grange²⁴ similarly criticise me for setting up a ‘forced choice’, noting the efforts since the 1992 Rio Summit to reconcile social justice objectives and environmental protection.

I disagree. Firstly, the students were not presented with any forced choice. They could choose to agree strongly, agree, disagree, disagree strongly or neither agree nor disagree. The binary variable I constructed from the question separated those who clearly agreed with a ranking of social inequality above wildlife conservation from those who were neutral, or who disagreed. Secondly, the binary variable I constructed is meaningful because the relative ranking of addressing social inequality and wildlife conservation is socially and economically relevant. There is a longstanding international body of research on

the relative ranking of concerns about social justice and environmentalism and on how this plays out in the activist domain in a red/green divide.⁹⁰⁻⁹⁶ Theories of sustainable development and ecosystem services approaches have sought to reconcile development and conservation objectives, yet in practice and in the presence of budget constraints, the problem of relative ranking of projects and in allocating particular parcels of land for development or conservation purposes persists.⁹⁷⁻⁹⁹ The debate over whether ‘half the earth’ should be set aside for protected nature reserves and what that means for human livelihoods and biodiversity¹⁰⁰⁻¹⁰² is a contemporary manifestation of the red/green divide.

For those working to address social justice, wildlife conservation is often portrayed as a ‘bourgeois’ pursuit, and in the South African context as not caring for the poor. I recall that when my husband and I dedicated several weeks in 2000 to helping clean and feed endangered African penguins rescued from a huge oil spill in Table Bay, we were criticised for spending our time on this rather than assisting poor people. The Johannesburg Child Welfare Society placed an advert in a national newspaper with a (white) child pouring oil onto his head with the logo ‘Now will you help me’? All this is evidence of a very real red/green divide in everyday South African life – and one that transcends simple racial divisions and classifications.

The relative ranking of red/green issues is clearly of contemporary interest in the South African context where unemployment is high and there is a pressing need for labour-intensive economic growth.⁶³ Given our history of apartheid, the persisting overlap between race and class,^{64-65,103} it is reasonable to explore the relationship between race and red/green issues and see if it shapes both the feeder stream into conservation biology (biological sciences) and whether students have an interest in a career in conservation. Studies of stakeholders involved in land-use planning have shown that there are racial/cultural differences with regard to the relative ranking

of economic growth and nature conservation,⁹⁸ so exploring the red/green divide with an eye for seeing how this might help us think about student preferences, is consistent with such work.

I do not agree that asking students for their response to question 1 ‘Addressing social inequality is more important than wildlife conservation’ is normatively loaded as there are reasonable and morally sound arguments that can be made in defence of agreeing, disagreeing or remaining neutral. Some critics argue that precisely because of South Africa’s history of land dispossession, ongoing inequality and patterns of racial disadvantage, black South African students are more likely to answer in the affirmative. I agree that this is a reasonable hypothesis. Which is precisely why I thought that the answers to this question might turn out to be a better determinant of whether students had considered biological sciences than being a black South African *per se*. This was an underlying hypothesis that shaped the empirical strategy – and I think my critics and I are on the same page here.

Where we are clearly not on the same page is that my critics castigate me for even asking this question because, they say, finding that black South Africans are more likely to agree will supposedly feed into and reinforce a racial trope about black people not caring about conservation. The BAC³ sees this as a ‘gotcha’ question, proposing instead that I should have rephrased the question to read: ‘Addressing social inequality and wildlife conservation are equally important’.

Firstly, it is worth noting that students who thought that addressing social inequality and wildlife were equally important could have opted to disagree or to remain neutral on the question as originally formulated. Secondly, if we had asked the question in the way suggested by the BAC, we would learn nothing about any potential red/green divide within the sample as the relative ranking of addressing social inequality and wildlife conservation is removed by the design of the question.

Presumably this was what the BAC intended in order to see off any potential data analysis that might (in their mind) reflect badly on black South African students. However, I disagree with the BAC that the question we asked reflects and reinforces any racial trope or stereotype. Firstly, agreeing that addressing social inequality is more important than wildlife conservation is not a normatively problematic stance. Secondly, less than half of black South African students in the sample agreed, and although this was a higher proportion than was the case for other students (which could well speak to the legacy of history as well as the pressures that characterise our society today) the difference was not statistically significant. In short, not only did my research not assume any racial stereotype, but even if the question could be twisted to be read as a stereotype, the results undermined rather than supported it.

Question 2 asked students for their responses to the statement 'I support wildlife conservation but have no interest in having a career in it'. This also speaks to the red/green divide, this time focussing more on career aspirations. More than two-thirds of all students in the sample agreed with this statement, which is unsurprising because a career in wildlife conservation is not a mainstream career choice for anyone. Yes, a higher proportion of black South African students agreed with this statement. But I see no reason why there is any inbuilt bias in this question, or that the result reflects badly on black South African students.

According to the BAC³, this is a 'gotcha' question because it does not allow students to signal that they might consider such a career if circumstances changed. The BAC suggests that we could have added 'at this time' to the end of the question. I am not convinced that this would have made any difference to the answers as this qualification is implicit in the question. Furthermore, the question is already complex (and I have been criticised by others for not breaking it down into two questions: one about supporting wildlife conservation and another about having no interest in a

career in it). Adding 'at this time' potentially adds a further layer of complexity to the already complex statement.

Question 3 asks students for their responses to the statement 'Many of South Africa's national parks should be scrapped and the land given to the poor'. This probes the red/green divide more directly by contrasting different land uses (scrapping some national parks, redistributing to the poor). Previous research has pointed to the attitudinal differences towards the ranking of development and conservation land uses in South Africa.⁹⁸

'Fallism'

Question 4 asks students for their responses to the statement 'Disciplines like conservation biology are colonial and should be scrapped at UCT'. This question tries to look at the issue through the lens of the current critique of colonialism, i.e. the theoretical perspective which rose to prominence during the 2015/16 student protests at UCT and elsewhere. The question picks up on the claim by a student activist, in a much publicised [video](#) of a meeting in UCT's Science Faculty in 2016,¹⁰⁴ that 'decolonizing the science would mean doing away with it entirely and starting all over again to deal with how we respond to the environment and how we understand it'. The article submitted by Van den Heever for this special issue, but declined by SAJS, comments specifically on this video:

In the course of the #ScienceMustFall campaign the issue was verbalised by a student at the University of Cape Town thus: '[S]cience as a whole is a product of Western modernity and the whole thing should be scratched off, if you want a practical solution on how to decolonise science, we'd have to restart science from ... an African perspective.' The debate unleashed by this video clip hinged on different perceptions of what the university (in general, but then also specifically the University of Cape Town) had come to be perceived as, namely as the institutional guardian of Western

scientific episteme, as a site of epistemic violence... In this view, hegemonic Western episteme normalises and naturalises the internalisation of an alienation from African (or, for that matter, any colonised) subjectivity. Epistemic violence is the internalised experience of being a colonised subjectivity. If decoloniality implies the promotion of 'subaltern reason', then the issue of who has the right to define what is to be researched and what counts as knowledge becomes a very acute issue and the site for flashpoints of contestation regarding who may speak about who/what in what manner.

(Van den Heever, unpublished manuscript sent to me as a personal communication).

The BAC³ argues that my research reinforces a stereotype that black people are anti-science. I am unaware of any evidence suggesting that such a stereotype exists, though it was certainly the case that on UCT campus, the activism displayed in the video¹⁰⁴ and in the #ScienceMustFall campaign, was clearly anti (Western) science. It was thus reasonable for my students and I to see if this perspective had any resonance within our sample in 2019, and if so, whether it was correlated with variables of interest.

In the exploratory analysis reported in the Commentary, I constructed an index by allocating scores of 1 through 5 respectively for answers ranging from disagree strongly to agree strongly for questions 3 and 4, and then added them together. I called this the 'Fallist' index.

This short-hand label seems to have caused some offense. I regret this. Fallism is a much broader set of ideas¹⁰⁵ than indicated by the questions comprising the index, or as expressed by the student in the video¹⁰⁴. Fallism on university campuses globally is linked to a critique of universities as colonial and as characterised by 'white' or European/Western knowledge and practices

that are seen as marginalising and even devaluing black lives, leading to feelings of abjection and rage.⁴¹⁻⁴⁵ It was a mistake for me to have tapped into this by using this particular short-hand term. That said, however, this does not invalidate the use of the questions, or the construction of the index as a summary indicator. It does not invalidate exploring whether this kind of critique of conservation biology and national parks as colonial impositions may have had some resonance in shaping whether students were more or less likely to have agreed to the statement 'I support wildlife conservation but have no interest in pursuing a career in it'.

I cannot help but wonder whether the anger over my having called these questions 'Fallist' was perhaps displaced anger at the fact that support for the kind of 'science must fall' discourse exemplified in the 2016 video¹⁰⁴ was not evident in the data. As the descriptive statistics show, hardly anyone agreed the conservation biology was colonial and should be scrapped. Of course, we would need to draw a larger, representative sample of students, and develop additional questions pertaining to Fallism and science, before making a generalization about students' attitudes towards Fallist discourse and ideology. My suspicion, given this exploratory survey, is that such a survey would find a wide range of views with limited support for anti-science discourse among the student body as a whole. What we can say, however, is that there is no evidence from the analysis presented in the Commentary that can be seen as supporting a supposed stereotype that black South Africans are anti-science.

Some of my critics argue that by asking these various questions pertaining to the red/green divide that my objective – and indeed the consequence of my Commentary – was to reinforce an alleged racial stereotype or trope that black people are not in favour of conservation. I dispute this. Where is the evidence that such a stereotype even exists? As Haffajee^{37,38} and Mzilikazi et al¹⁹ point out, there are many black people working in conservation in South Africa, including in

leadership positions. I agree, whilst noting also that there remain important, ongoing challenges to promote further transformation.¹⁰⁶ So, where does this supposed stereotype (that black people don't favour conservation) come from? Does it even exist?

The role of colonial governments in demarcating and policing protected areas has certainly fuelled an Africanist narrative construing protected areas as (white) colonial impositions and framing their perpetuation as playgrounds for rich foreign tourists as a form of ongoing injustice and exploitation.¹⁰⁷ This could potentially fuel the perception/narrative that conservation is a 'white thing' and hence something alien to African lives. Yet other African voices contest this narrative¹⁰⁸ and the historical record reveals that African elites, especially in the post-colonial period but also under colonialism, often shared an interest with white conservationists in protecting wildlife resources. Importantly, at a 1961 international conference in Arusha, Tanzanian President Julius Nyerere declared that:

The survival of our wildlife is a matter of grave concern to all of us in Africa. These wild creatures amid the wild places they inhabit are important not only as sources of wonder and inspiration but are an integral part of our natural resources and of our future livelihood and wellbeing. (cited in Bolaane,¹⁰⁹ p.247).

Nyerere's statement proved politically and ideologically important in mobilizing support from African elites in Botswana to join with white conservationists to prompt the unwilling colonial government to designate Moremi (in the Okavango) as a reserve to protect wildlife from unconstrained hunting (mostly by South Africans).¹⁰⁹ Southern and East African governments have continued to support wildlife conservation, and the expansion of community-based natural resource management (CBNRM) across the region has enabled wildlife to increase in ways that support rather than undermine local livelihoods.¹¹⁰

If there is a racial stereotype about black Africans not caring about conservation, it is in the minds of the critics making this accusation, not in my mind. I agree with Dziwa²⁵ that blanket statements about black people holding unfavourable attitudes towards wildlife are 'nonsensical'. Dziwa seems to think we differ fundamentally on this, but we are actually on the same page here. Where we are not in agreement is that I was prepared to explore whether *at the margin*, beliefs about the coloniality of conservation etc might shape subject choices or career preferences. This is not the same thing as making racist, generalized assumptions. Rather, it entails probing variation in attitudes between students and – as is clear from the descriptive statistics and the results of the multivariate modelling – these differences transcend racial categories.

Evolution

The survey asked students if they strongly agreed, agreed, neither agreed nor disagreed, disagreed or disagreed strongly with the statement 'Humans evolved from apes'. The analysis in the Commentary included a binary variable taking the value of 1 if students agreed or agreed strongly the statement (and a value of zero for all other answers). This question has been the subject of particular criticism.

International opinion polls ask about belief in evolution (see e.g. Williams¹¹¹ for the UK and Pobiner¹¹² for the USA). Most Americans reject biological evolution,¹¹² with disbelief in evolution linked to schooling, religiosity, and social networks.^{113,114} There is also an emerging social science literature probing the connection between belief in evolution, religious orientation and other variables of interest such as animal rights.¹¹⁵

In the South Africa context, might questions about evolution be particularly problematic? According to the BAC³:

Because of racism most black people are sensitive about being associated with apes or monkeys. The question in

its original form asks black students to indirectly associate themselves with apes. The question becomes psychologically even more problematic when/if the interviewer is white.

(I should note here that most of the student interviewers were black and none of them reported any such awkwardness during the research.) Athreya and Ackermann¹¹⁶ argue persuasively that human origins research has been shaped by colonial attitudes and imaginaries that have perpetuated the primitivizing and othering of non-European cultures. This might generate suspicion and distaste amongst African students towards theories of human evolution. In this regard, I concede that this question *might* be regarded as racially loaded. The BAC³ suggests that it might have been better to ask students to respond to a statement like ‘I am not convinced by the theory of evolution’. This is a useful suggestion. It is certainly something to explore further before embarking on a major survey.

I suggested in the Commentary that the relatively low percentage of students (and in this case, especially with regard to black South Africans) agreeing with the statement probably had to do with inadequacies in the schooling system and with high levels of religiosity. If black South Africans were less likely than other students to agree with the statement because of the kinds of negative associations outlined by Athreya and Ackerman,¹¹⁶ then this would obviously confound the issue. Yet the relationship between schooling, religiosity and belief in evolution is still worth exploring, though ideally with more and better questions. International surveys ask about science and evolution in different ways,¹¹⁷⁻¹¹⁹ and there is more for us to learn here.

In the US, research has shown that apparent racial differences concerning evolution turn out to be better explained by social conservatism, religiosity etc¹²⁰ – in much the same way as I found that attitudes towards

studying biological sciences is better explained by attitudes towards conservation than by ‘race’. According to the most recent (6th) wave of the World Values Survey,¹²¹ most South Africans agreed that ‘Whenever science and religion conflict, religion is always right’. About three-quarters of black South Africans and two-thirds of other South Africans prioritized religion over science when there is a conflict. The extent to which these differences can be linked to schooling and political attitudes (as in the American studies discussed above) is something worth exploring further. It might also be a productive line of inquiry for future surveys of student preferences for particular subjects, especially the biological sciences, given that evolution lies at the heart of their curriculum.

For some of my critics, the problem was not with the question itself, but rather with the suggestion in the opening paragraph of the Commentary that I was expecting (or assuming) that belief in evolution differed according to race. I did not assume any such relationship. I did *hypothesize* that it might differ given the overlap between race and class in South Africa, how these give rise to schooling opportunities, and the negative association (demonstrated in the international literature) between disadvantaged schooling and belief in evolution. The fact that a higher proportion of black South Africans than other South Africans in the 6th wave of the World Values Survey agreed that in conflicts between science and religion, religion is ‘always right’, provides further reason for holding such a tentative, exploratory hypothesis. Is this racist? I think not. Nongxa¹²² makes a similar point about the likely role of religion in shaping attitudes towards evolution and uses this to criticise me for presenting what may well be a ‘spurious correlation’ between race and attitude to evolution. I agree it probably is a spurious correlation, which is why I flagged in the Commentary that the result probably speaks to the degree of religiosity in South Africa. More work is required to tease out the relationship between race, religion and belief in evolution.

Finally, there have been criticisms of this question for being confusing and not a good test of understanding (or acceptance) of evolution. Most obviously, it is not strictly true that humans did evolve from apes, but rather that humans and apes share a common ape-like ancestor.²⁴ I accept that the more popular formulation used in the survey as an indicator of support for evolution could have elicited a disagree response from those who would have preferred the statement to have read that Humans and apes share a common ape-like ancestor. If we had phrased the question like this, however, it would probably have perplexed students who are not well versed in this literature, thus generating a different type of noise in the attitudinal data. It is always hard deriving attitudinal questions. If I were to be part of another survey team, I would suggest that we ask the question both ways and try to learn something from the distribution of answers.

Materialism

Another source of controversy over my Commentary has been over my use of the concept of materialism. There is an enormous literature on materialism in contemporary South Africa. Southall¹²³ discusses at length the association of the 'black middle class' with a lifestyle defined by consumption and the imperative of acquiring the income to support this – and hence the imperative of an appropriate education in order to access high-paying opportunities. Individuals such as Kenny Kunene (who is infamous for serving sushi on the bodies of near-naked women) and phenomena such as *izikhothane* (a youth subculture involving the burning of expensive clothes, shoes and even money) fuel stereotypes. As Southall points out, novelists such as Zakes Mda (in *Black Diamond*, 2009) and journalists such as Fred Khumalo further contribute to this representation of the 'black middle class'. Southall concludes that this narrative is at least partly true.

There are, however, many likely motivations behind an emphasis on well-paid employment. Materialist values, in South Africa as elsewhere, can be understood in diverse ways.

They can be a response to social pressures, i.e. to the obligation to support poorer, dependent kin, i.e. pressure to convert 'private' wealth into 'social' wealth.¹²⁴⁻¹²⁸ They can be a response to the pressures of consumerist advertising, including the promotion of consumer credit,¹²⁹ or to neo-Pentecostal religious convictions.¹³⁰ They can reflect an aspiration to recognition or status, framed by consumption.^{69,123,131-133} Or they can simply be the consequence of the easing of apartheid-era restrictions on the opportunities facing black South Africans, i.e. to 'freedom'^{51,134} or 'a realization of citizenship' and 'an assertion of racial pride'.^{123, p.169-70, 173}

The analysis in the Commentary was based on questions drawn from the World Values Survey. The World Values Survey¹³⁵ has, for many decades in many countries, asked questions about values and attitudes, many focused on the difference between 'materialist' and 'post-materialist' values. The questions pertaining to materialism are based on earlier work by Inglehart¹³⁶⁻¹³⁸ in which he argued, following Maslow's hierarchy of needs,^{139,140} that physiological needs followed by physical safety are the most fundamental ('materialist') needs and hence it is likely that these concerns will dominate at lower income levels. Inglehart argued that, with rising incomes, social values shift towards 'post-material' concerns (pertaining to self-expression, environmental concern and quality of life).¹⁴¹ This is of relevance to conservation, given the evidence linking a post-material value orientation to support for environmental protection^{142,143} and evidence showing that people in developing countries are less likely to support environmental protection when explicitly framed as being at the expense of economic growth.¹⁴⁴

Respondents in the World Value Survey are invited to rank what they think their country's top two goals should be from a battery of between four and twelve questions touching on law and order and economic growth and stability (the 'materialist' orientation) as well as environmental concerns and shifting to a more decentralised society where ideas count

more than money ('post-materialist' orientation). Lant Pritchett¹⁴⁵ used such data collected over time to argue that the median voter in most developed countries has shifted from holding materialist to post-materialist values whereas the median voter in developing countries has remained materialist. He argues that this is causing a mismatch between the kind of development aid donor countries wish to provide, and the kind of growth-oriented economic financing developing countries desire (see Loubser¹⁴⁶).

There are of course legitimate concerns about cross-country comparisons using the World Values Survey^{147,148} given that concepts and questions may be understood differently in different contexts. Yet cross-national studies have shown that materialism is not uniquely associated with 'the West'¹⁴⁹ and a case can be made that the materialist/post-materialist distinction travels well cross-culturally because feeling secure or insecure about survival is meaningful in most (and probably all) societies.¹⁵⁰ Some South African scholars^{151,152} have argued in favour of including additional questions (probing so-called 'pre-modern' value orientations, such as access to water and other basic needs).

The debate over the international comparability of questions posed in the World Values Survey has implications for how we study big questions of comparative political science, for example the links between value orientation, living standards and support for democracy. Whether the use of the World Values Survey questions to probe differences between students in the same local context (in my case, at UCT) is a different issue. What is most relevant here is whether the World Values Survey questions were adequate to distinguish a 'materialist' orientation amongst UCT students, and then to see how that maps onto whether students agreed with the statement 'I support wildlife conservation but have no interest in pursuing a career in it'. As this was exploratory research, we included several questions probing financial versus other motivations in career choice (which I did not report on in the Commentary) as well as

the standard battery of questions from the World Values Survey.

For some of my critics, the word 'materialism' appears to have been read not in the sense operationalised within the World Values Survey, but rather as a judgement with profoundly negative connotations. Perhaps they imagine that I am picking up on the well-established scholarly debate on conspicuous consumption. Adesina²² for example, detects what he sees as a negative attitude towards materialism and even, bizarrely, a 'subliminal injunction' in my Commentary that advises or instructs black South African students not to be materialist, that is not to go into law or accountancy.

It is possible that some of my critics are working with a notion of materialism that is embodied in Madonna's 1984 hit 'material girl'. Madonna sang that 'the boy with the cold hard cash is always Mister Right', because 'we are living in a material world and I am a material girl'. Materialism here is clearly associated with prioritizing money over love. The enormous literature on transactional sex is relevant here and speaks to some very important current gender and sexuality issues.¹⁵³⁻¹⁵⁷

Some ways of measuring materialism clearly carry normative freight. For example, Richins and Dawson¹⁵⁸ developed a much-used scale which tries to explore the extent to which the acquisition of possessions is of central concern to someone's life and the extent to which obtaining wealth and possessions is the marker of a successful/good life. The scale they develop includes explicitly normative values, such as responses to statements like 'I like to own things that impress people' and 'I enjoy spending money on things that aren't practical' and 'I like a lot of luxury in my life'^{158, p.310} Materialism understood in this way has been linked to self-centredness, self-doubt and the social and individual disadvantages of emphasizing products and material possessions over experiences, and the trade-off between social relationships and material pursuits.^{159,160}

The World Values Survey does not operationalise materialism in this way. Materialism was not operationalized in this way in my Commentary. There is nothing inherently unworthy or undesirable in prioritizing economic stability and growth over environmental and other concerns. As Somerset Maugham once wrote:

There is nothing so degrading as the constant anxiety about one's means of livelihood. I have nothing but contempt for the people who despise money. They are hypocrites or fools. Money is like a sixth sense without which you cannot make a complete use of the other five. Without an adequate income, half the possibilities of life are shut off.^{161, p.314}

Adesina²² (2020) claims, strangely, that I have argued elsewhere⁶⁵ that “‘crass materialism” characterizes black South Africans in the post-apartheid era’. Seekings and I make no such claims in the book he refers to⁶⁵ which focusses on the politics and economics of enduring poverty and inequality in South Africa. Does Adesina think that it is offensive even to write about inequality in the income distribution, and about state failure to deliver welfare to the poor in case this is seen as reducing black lives in some way to material conditions?

Economic incentives

Some critics appear to be uncomfortable with the association between materialism (as a value orientation) and economic incentives, even implying that it was racist of me to suspect that black South Africans might prioritize better-earning jobs over conservation careers. I disagree that this is racist logic. Indeed, it is axiomatic in economics that people – all people – respond to material incentives.

The use of economic incentives is now recognised as ‘one of the most effective mechanisms for mainstreaming biodiversity conservation in bioregions’^{162, p.1} – though concerns remain about this potentially crowding out intrinsic motivations.¹⁶³ The only negative stereotype linking race and

materialism of which I am aware is the old colonial trope that Africans are ‘lazy’ and economically irrational. More specifically, the ‘backward-bending supply curve’ argument held that African workers’ ‘wants were so limited that if offered wage increases, they would, unlike other men, respond by working less.’^{164, p.232} Such theory has long been discredited.^{164,165}

Haffajee³⁷ argues that it is ‘race science’ and ‘nonsense’ to suggest that subject and career choices among black South African students might be shaped by economic considerations. She and others imply that my ‘white privilege’ prevents me from understanding the experiences of black South Africans. It seems to me that it is Haffajee herself who is insensitive to the pressures on many South Africans to seek better-paying jobs, not only for their own personal benefit but also to enable them to honour their perceived obligations to others. This, in a context of poverty and dependency, is often referred to as ‘black tax’.¹⁶⁶ The racialised origins and nature of inequality in South Africa mean that it would be surprising if black South Africans were *not* more likely (than white South Africans) to prioritise economic considerations over ‘post-materialist’ concerns.

As is clear from the findings in the SANBI/Lewis Foundation report,³⁶ black South Africans in the biodiversity sector, like other people, are driven by *both* a passion for nature conservation *and* considerations pertaining to career advancement and salary. Research into motivations and aspirations amongst black South African entrepreneurs similarly revealed both a strong desire to make enough money to support their families as well as make a difference to society, work on something they were passionate about etc.¹⁶⁷ The exploratory research reported in my Commentary was not seeking to cover every possible dimension or meaning associated with materialism. Rather, the analytical strategy was to employ the World Values Survey conception of materialism to see if it had any impact *at the margin*, or more specifically, on the average marginal probability of supporting wildlife

conservation but having no interest in a career in it.

In the USA, research has shown that African Americans are under-represented in animal welfare fields because of the importance of civil rights (another manifestation of the red/green divide) and (inter alia) concerns to obtain a well-paying job.¹⁶⁸ Neumann¹⁶⁹ found, using survey data, that in the USA 'the typical animal welfare volunteer is female, White, pet-owning, heterosexual, employed, childless, married or partnered, Democrat-leaning, between the ages of 40 and 59, has an income between \$50,000 and \$99,999, and is Protestant'. Kilbourne and Pickett¹⁷⁰ found a link between materialism and attitudes and practices pertaining to the environment. Lu et al¹⁷¹ found a negative relationship between materialist value orientation and interest in ecotourism and willingness to pay a premium for ecotourism products and services.

Adesina²² argues that I could have worked harder to collect data that would have enabled me to control for additional factors, notably economic class, rather than rely on the implicit link between materialism and socio-economic status. The exploratory survey did ask a set of questions about how students were funded, whether they had loans or were also working to put themselves through university. These questions, unfortunately, generated insufficient variation across the sample to be used as any indication of relative socio-economic status. Ideally, if we were to run a full survey, with a representative sample, then we would certainly reconsider how we might measure accurately students' socio-economic backgrounds. We might, for example, ask students for permission to access their application forms on which parental income is recorded along with other details about their school background. This would, of course, entail a whole other set of ethical considerations and would have to be approved by the relevant faculty ethics committees.

Attitudes to local wildlife and experience with pets

The binary variable whether people 'liked' having starlings around at UCT was drawn out of a set of questions we asked students about attitudes towards, and experience of, local wildlife. Our initial informal discussions with students to inform the questionnaire design suggested that conservation biology students were fascinated by starlings, whereas at least some students in other disciplines and faculties regarded them as 'dirty, flying rats'. Research on attitudes to pest animals has shown that people with experience of companion animals (pets) were more likely to have positive attitudes to wild animals, including pest animals.¹⁷²⁻¹⁷⁵ It was thus not unreasonable in my exploratory research to include questions about wildlife that might be perceived as pests as well as the number of different kinds of pets that students had owned.

Redwing starlings are indigenous birds, many of whom have made their home at UCT. They are the subject of a great deal of research. Many have had brightly coloured bands placed around the legs by research scientists for identification purposes. Redwing starlings can tolerate a wide range of food and are known to raid food from students. Some students feed them. A recent masters dissertation found that redwing starling adults eat 'junk food' from students, but do not feed it to their chicks.¹⁷⁶ A recent scientific article, also based on research conducted by a Masters' student, showed how redwing starling diet varied depending on whether human food was available (during the week and in term time) and when it was not.¹⁷⁷ The research for that paper entailed the analysis of multiple observations of starlings (identified by their leg bands) and linked to GPS co-ordinates, and data contributed by multiple students and staff, including volunteers linked to iCWild. It was neither racist nor bizarre for us (as suggested by one commentator¹⁷⁸) to ask students about their

attitude towards this most visible form of wildlife on campus.

My student research assistants also hypothesized that students who had more experience with pets (defined in the questionnaire as ‘animals you fed, touched and felt close to’) during their childhood might be more interested in zoology and the other biological sciences and in particular be less concerned about handling live and dead animals. We thus thought that there could be a relationship between a student’s past experience with pets and whether the student had ever considered studying biological sciences. Any apparently racial differences in career choice among UCT students might be due to different experiences with pets. I see nothing inherently offensive about asking questions in a survey about pets.

What should we make of the argument that by even asking questions about experience with pets and whether students ‘liked’ the local wildlife I was being ‘racist’ because the results could feed into a negative trope or stereotype about black South Africans not liking animals? Survey research elsewhere suggests that pet ownership is experienced and understood differently across socio-economic classes.^{179,180} There is also a substantial qualitative and quantitative literature from America showing that pet ownership and attachment can vary across ethnic groups^{179,181,182} To the best of my knowledge, however, very little has been written about pet ownership and attachment in South Africa. Spicer’s research in Cape Town¹⁸³ is pioneering in this regard. Spicer shows that pet ownership varies across space and class, but she provides plenty of evidence that black South Africans in Cape Town have pets and love them. Dziwa²⁵ grew up in a family with five dogs that were ‘pets, companions and protectors’ and Nongxa¹²² makes a similar point. It is very likely that these experiences are widely replicated elsewhere. If there is a ‘trope’ out there about black South Africans not having or caring about pets, it is not one that I have come across or hold.

Part of the problem with questions about pets, and my inclusion of this data in the analysis, seems to be that it has been interpreted, in Dziwa’s words, as ‘whiteness talking very loudly’.²⁵ The assumed trope/stereotypes that are being complained about do not necessarily have any historical or empirical validity, but rather appear to reflect what my detractors think is going on in my mind. To reiterate: I was not assuming that black South Africans did not have or like pets. I thought it was likely that experience with different kinds of pets, at the margin could make a difference to whether a respondent had ever considered studying biological sciences (and the regressions showed this was indeed the case). Given the financial burden that comes with pet care, it was a reasonable to suspect also that socio-economic inequality and the legacy of apartheid make it less likely that black South Africans, on average, would have as much experience with pets as other students. Ideally we need more and better data, especially on socio-economic background, to understand these interconnections better.

Studying Culture: Is it permissible if ‘race’ is involved?

As all sociologists know, values and attitudes are embedded in social structures which are historically derived, yet continually adapting, and which transcend the lives of individuals.¹⁸⁴ Attitudes and practices towards animals are likewise embedded in a changing cultural frame.¹⁸⁵ This makes culture – understood as fluid – a legitimate topic for survey research, even if the kinds of questions we ask can at best only provide ‘signals’ about a much richer and dynamic sub-strata of ideas, beliefs and practices.

There is an international literature on cultural differences regarding the management of animals and the environment. For example, Aslin and Bennett¹⁸⁶ discuss the different ‘world views’ within Australian aboriginal culture and individual attitudes, and those of Anglo-Australians steeped in a Greco-Roman philosophical tradition. This, they find, has an

important bearing on how wildlife and feral animals are managed, with Aboriginal Australians, for example, having a wider, more tolerant and embracing notion of how humans fit into the natural world and thus being more accepting of feral cats (seeing them as belonging to the country), and Anglo-Australian managers wishing to eradicate them. Aslin and Bennett conclude that studying comparisons of this kind can ‘help provide social perspective on the western scientific knowledge systems, biological concepts, and often-unexamined assumptions that underpin much formal wildlife policy and practice’.^{186, p.32}

As noted earlier, cultural differences concerning nature and the environmental crisis have been explored in the South African context amongst land-use planning stakeholders using the ‘New Ecological Paradigm’ and the ‘Inclusion of Nature in Self scales’.⁹⁸ A key finding was that racial/cultural differences varied according to the scale used. The paper was not afraid to grapple with the issue of race and culture when it came to responding to the ecological crisis and managing natural areas. More specifically, the study found that ‘Xhosa participants, who comprise the vast majority of all stakeholder groups in our study domain, are more likely to resonate with messages that de-emphasize the ecocrisis and limits to growth scenarios’ even as they (unlike ‘white’ and ‘coloured’ respondents) considered themselves part of rather than separate from nature.^{98, p.212}

Clearly participants associated with the previously disadvantaged Black majority (Xhosa and Coloured) tend to show lower – and different – levels of ecocentricity than members of the White minority. These differences are likely underpinned by a wide range of factors, notably higher poverty and lower educational levels but also a strong appreciation for the primacy of economic growth as a means for overcoming poverty, and mistrust of the motives of the conservation sector.^{98,99} Interestingly, Sheppard (1995) showed that African American

adults eschewed ideas of limits to growth and were more likely to prioritise economic growth over environmental concerns than their White counterparts.^{98, p.211}

Are my critics suggesting that this kind of quantitative cultural analysis is now unacceptable in South Africa today? Are they suggesting that the international literature on ethnicity and animal practices, attitudes and attachment should not be replicated in South Africa in case it is perceived as coming from a place of white privilege and thus as racist? I sincerely hope not. Such censorship (and self-censorship) is a first step on a dangerous slippery slope that could quickly cut off many important areas for social research. It would threaten research into the relationship between ‘race’ and socio-economic status (or class) in South Africa, making it harder to design policies aimed at alleviating poverty and reducing racial inequality.

Conclusion

There is no doubt that more and better questions could have been used to inform my exploratory survey and the data analysis. It is obviously the case that a larger and (more) representative survey would have been a better platform for statistical analysis. I accept the many criticisms about the limitations of my sample and the data analysis. I had hoped that by publishing the research in a Commentary that this would also have helped flag the exploratory nature of the research. I accept the points made by Sanders¹⁸⁷ and others that the Commentary format may have been an undesirable format for presenting my exploratory research, at least without referencing a longer, more detailed discussion. It may also be useful for the journal to develop policy specifically towards the presentation and publication of *exploratory* research where it can be more easily understood and delineated from *confirmatory* research (see Nilsen et al²).

During the painful but still interesting process of writing this reply I have come to understand that the way I presented the exploratory research in the Commentary may have been

confusing. Jaeger and Halliday,¹⁸⁸ in writing about the difference between exploratory and confirmatory research, provide a set of warnings about the style of presentation for exploratory research, notably that such research should be careful about how underlying hypotheses are presented. I wish I had read this paper before writing the Commentary (discovering their paper was one of the many positive things I have learned through all this). So, how would I have written the introduction differently? Here is an attempt in track changes:

An exploratory survey of University of Cape Town (UCT) students in mid-2019 drew attention to an important, but under-researched, question for transformation: why do conservation biology, zoology and the other biological sciences at UCT subjects struggle to attract black South African students? A large part of the answer is obviously that persisting inequalities within South Africa including in the schooling system make it less likely that black South Africans will have the opportunity to reach university or they will meet the entrance requirements for science courses. This Commentary focusses on additional possible reasons, notably student choices and the attitudes that might help us move beyond race in understanding the challenge of transformation both for UCT and the conservation sector. More specifically, the Commentary explores the role of ~~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' student protests of 2015/2016 and the associated critique of colonialism on campus, 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 for the analysis

presented here was whether students had ever considered studying zoology or the biological sciences, irrespective of whether or not they met the entrance requirements. The analysis shows, through a set of multiple regressions, that students who agreed with the statement 'I support wildlife conservation but have no interest in a career in it' were much less likely, at the margin, to have considered studying biological sciences. We then explore the role of materialist and other values in shaping, at the margin, this career preference. The analysis is exploratory and does not seek to provide a full explanation of study or career preferences. Rather, the intention is to start a conversation and prompt further, more representative research in this under-researched area.

This edited version of the introduction might address the concerns of some of my critics, but certainly not all of them. An old friend and colleague wisely observed about the contestation over my Commentary that it was 'like a Rorschach test', with people seeing and imagining it very differently. Those whose objections are rooted also in a rejection of survey data analysis, or in the fact that I am a white person doing this kind of work, will not be propitiated and neither will those who have adopted a strong position against any form of statistical exploration on a non-probabilistic sample. It is possible that some of my particularly hostile critics will continue to read my introduction as racist, or as betraying racist assumptions despite my efforts to elaborate on the rationale behind the questions.

I would also like to make the point here that many other natural scientists, social scientists, people working in conservation and members of the general public have written to me to say that they see nothing wrong with the Commentary as originally formulated and titled. My inbox is full of supportive emails from both 'black' and 'white' people. Many of the academics and students have expressed concern about the wave of condemnation and hatred (and I do not use these words lightly) that rolled cross the social media about my

Commentary. A common theme in these emails is that they supported me, did not think that I or my work was racist, but were too scared (again, I do not use this word lightly) to speak out in any forum at all.

This brings me back to the points I made in the opening pages of this reply about what has become a hegemonic position at UCT (and, it seems, on many other campuses in South Africa and globally) about race – and linked to this, about what are seen as acceptable topics to research, and how, and by whom. This hegemonic ideology is intolerant of alternative perspectives. The ‘rebuttal’ by Ross²¹ in this special issue, and by Kahn and Alves⁶² from UCT’s Office of Inclusivity and Change, are examples of how a series of condemnatory pronouncements and statements of truth-by-assertion rather than argument has largely replaced genuine academic engagement about race on my campus. Ross’s rebuttal is best read as a form of virtue-signaling in this highly charged context. Unfortunately, such virtue-signaling can also degenerate into what Benatar calls ‘vindictive victimhood’⁴⁷ and what younger people tell me is known as ‘cancel culture’ where those deemed to be on the wrong side are subject to vitriolic condemnation and shunned. This totally eliminates debate. This has terrifying (again, I do not use the word lightly) implications for both universities and democracy. I am thus grateful to the SAJS for resisting pressure, including from my own institution, to withdraw the Commentary and instead provide this opportunity for exchange of views and ideas. Without reasoned debate we are lost.

Obviously, my results barely scratched the surface of what we need to know. I agree with Rosenberg and le Grange²⁴ that ‘there is no room for the qualitative and nuanced dimensions of people’s intentions, feelings and understandings and actions in the tiny, tidy tables of narrow survey findings.’ Additional qualitative and ethnographic research could prove very productive. I accept the argument made by Mothapo et al²⁰ about the importance of improving the institutional climate at universities and encouraging a greater sense of

belonging amongst all students in the sciences. I also accept that it is quite possible that, in a larger, more representative sample, the statistical associations I picked up in the analysis would not be replicated. None of this, however, means that my exploratory research should not have been published as a Commentary.

The value of the exploratory research lies chiefly in the two ‘signals’ I picked up in the data analysis, and which I hope could help inform a wider and inter-disciplinary exploration of the challenge we face with regard to increasing the diversity of scholars and colleagues skilled in both biological sciences and conservation biology. These were worth reporting, with all the necessary caveats concerning the limitations of the sample and the overall weakness of the models.

The first of these signals was that in this sample of UCT students, supporting wildlife conservation but having no interest in a career in it was a better predictor of ever having considered biological sciences than ‘race’, and indeed, including it in a multiple regression knocked out the statistical significance of ‘race’. Attitudes towards the relative ranking of addressing social inequality and wildlife conservation, as well as the number of different pets owned, had smaller, but still statistically significant effects. The second signal was that supporting wildlife conservation but having no interest in a career in it was correlated with a materialist value orientation (as defined by the World Values Survey) and attitude to the local wildlife at UCT (proxied by attitude towards the redwing starlings). Including these indicators in a multiple regression knocked out the statistical significance of ‘race’.

Some scholars might reasonably reject these findings because of the limitations of the sample and/or the questions. Others might be prompted to explore the issues further using different and better methods (as suggested by Midgley⁶). My hope, in writing the Commentary – and again through the additional context I have provided here – is

that my research be understood as exploratory, reasonable and grounded in an extensive scholarly literature. Rather than being condemned as 'racist', it should be seen as a contribution to the early stages of thinking and conceptualising that might inform a wider, and more interdisciplinary research initiative on a topic that clearly is worth researching: transformation. Our universities and our

society as a whole will be better places when our professors, lecturers and students reflect better the rich diversity of our society here in Southern Africa, and when we can draw on global scholarship as well as local understandings to address the pressing social and environmental challenges of our time. I hope that the debate over my Commentary will contribute to this objective.

Editor's note:

*In this response, Prof. Nicoli Natrass refers to Appendix A. With her knowledge, the appendix has been removed. The document was not 'apparently turned down for being anonymous' as she states. It was turned down **because** it was anonymous. In common with other academic journals, the SAJS does not publish material of any kind from unnamed sources. Despite our encouragement to submit formally, the author declined.*

The contribution by Prof. Gerhardus van den Heever to which Prof. Natrass refers was declined for publication in this special issue as his contribution was not a response to Prof. Natrass's Commentary.

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