The use of English in South African science

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Scientific reports, articles, strategies and plans in South Africa (and elsewhere) are often written in unnecessarily confusing, complex and obscure language. While this is often unintended, it can be used by some to assert authority and discourage inquiry or dissent. Specialist styles of writing and jargon used by business, management or socio-economic development professionals are often copied or echoed in other contexts where their meaning is less clear. Although there is some very clear scientific writing in South Africa, confusing and obscure writing is common and may even be a growing problem. This style of writing may act as a barrier to entry for speakers of English as a second language (the majority of South Africans), who must devote extra time to mastering the medium rather than the content of science writing. The problem is even found in some school textbooks aimed specifically at speakers of English as a second language. The various uses of poor language in science in South Africa have unwanted and potentially serious implications, including supporting unwanted power and institutional hierarchies, alienating the general public, confusing decision-makers, hampering efforts towards transformation, discouraging debate, and diverting time and energy away from scientific work and cooperation.

Introduction

Scientists discuss work and disseminate results through technical reports, journal papers, summaries, press releases, funding proposals, newsletter articles and many other formats. Important issues such as funding, advocacy, promotion, awarding of qualifications, cooperation with other professionals and the incorporation of research into policy depend on work being published or communicated in one form or another. Most scientists are primarily concerned about the work itself and later getting it 'written up'; fewer give equal attention to the style or manner in which it is communicated. Taken together, language issues such as style, use of jargon, register, grammar and tone determine whether a piece of writing is accessible and readable, or confusing, boring or even intimidating.

Scientists and managers of scientific organisations sometimes complain that policymakers and funders don't listen to them, or that the general public doesn't understand or appreciate their work. However, this may be because the way in which scientists write and express themselves is increasingly circumscribed by the habits and conventions of that particular group and may not be effective outside of their discipline - as Sand-Jensen[1] playfully remarks:

> Although scientists typically insist that their research is very exciting and adventurous when they talk to laymen and prospective students, the allure of this enthusiasm is too often lost in the predictable, stilted structure and language of their scientific publications.

Confusing language in South African science: examples

Some examples of poor writing about science or in scientific publications in South Africa today are given below:

A few years ago an environmental science project at a large South African research institution was summarised in the following way to fellow scientists:

1. The UVP is to enable sustainable economic and social development of ecosystem-scale linked river-coastal domains. The aim is to use the improved understanding of how to select critical linkages across the system to allow more reliable cost-benefit assessments of catchment development programmes. Development programmes, especially those of a transboundary nature, should use this methodology to internalise the lagged impact costs of river basin development plans on coastal goods and services.

The description continued:

2. To achieve this, significant investment needs to be made on understanding ecosystem scale linkages, the science, and skills capacity building. Therefore, the goal of the [*project*] investment strategy is to create a new cross-programme intellectual space from where stakeholder driven innovation can grow in respect of a future market in river/ground water – coastal, biophysical – resource economic links.

A newsletter put out by another South African research organisation, aimed at the general public, began a short article a few years ago as follows:

3. Contemporary international mapping programmes are characterised by stringent time restrictions and tight financial constraints, requiring systematic and innovative methodologies to ensure that the projects are achieved in a cost-efficient manner and on time.

These three examples use long sentences, polysyllabic words, abstract language and complicated sentence structures to describe the projects. They also make use of jargon borrowed from other disciplines, such as 'lagged impact costs', 'significant investment' and 'innovative methodologies'. Taken together, these things make it difficult for the reader to work out what the projects are actually about. Note that the writing was intended for those outside of the specialist project team – and in the case of example 3, for the general public.

Influence of other disciplines and styles

Confusing writing about science is often unintentional and reflects styles from elsewhere which are unconsciously adopted. However it can also be deliberate – a conscious effort to appear up-to-date and sophisticated, to repel criticism, or to align with an important and powerful group of some kind. One such group is the business or marketing world, known for its buzzwords and 'spin'. Business and marketing are important to scientific research today: sources of funding have changed for many scientific institutions in South Africa in the last 15 years to 20 years, as elsewhere in the world. Most institutions must earn some of their running costs by doing research for private-sector clients and need to promote themselves. Many scientists are now required to become more 'market focused' and profit aware and it is often argued that a stronger business ethic is needed in scientific organisations. It has been a controversial transition, with arguments for both sides. But it has harmed the language of scientific communication – many large South African scientific institutions now have an element of private-sector business focus, with the language to match. The examples quoted below are from real emails sent to ordinary scientific staff by different tiers of management at large South African research institutions in the last few years:

4. Part of the latter involves the development of more widely shared strategic spatial perspectives on critical what-if, action space and what else questions (the latter referring to 'are we doing enough?'), hopefully leading to shared notions on critical development and environmental management hot spots.
5. Shared services is a collaborative strategy in which a subset of existing business functions are concentrated into a new, semi-autonomous business unit that has a management structure designed to promote efficiency, value generation, cost savings, and improved service for the internal customers of the parent corporation, like a business competing in the open market.
6. He recommends that the plans should be used as guidelines within management teams and work groups to ensure that structured conversations take place towards implementing appropriate initiatives. He adds that transparency in establishing the key objectives for the organisation and managing our performance is an integral aspect of how the [*organisation*] intends conducting its operations.
7. This strategy is seen as a key step in moving away from market activity in areas of abundant supply, and moving towards value-based pricing through differentiation and elevation of offerings to the key solution level.
8. [*The organisation*] is aligning all investment with Strategic Management of Innovation through focused attention on Thrust strategies and developing a broader skills base in technology management. Accordingly, our business as a KITO will be based on a strong foundation of intellectual capital, with improved models to achieve impact and delivery into the market.

These examples are generally confusing and contain a lot of jargon and cliché. They also show a strong 'business' influence, seen in phrases like 'competing in the open market', 'business functions', 'open market', 'value generation', 'value-based pricing' and 'delivery into the market'. It is likely that scientists themselves, in their own communications, may be influenced by such 'business-speak' in thinking about and describing their work. Examples 1 and 2 above, with the phrases 'significant investment', 'projects are achieved in a cost-efficient manner and on time' or 'cost-benefit assessments' are examples of this. The examples also show a lack of concrete detail, concentrating far more on the abstract and the vague. Such writing may even substitute for concrete detail, which the writers are unwilling or unable to provide.

Another example of a potentially confusing jargon-rich style of writing that influences scientists is that of international socio-economic development. Scientific reports (particularly in the natural sciences, possibly because of the influence of funders) today may mention 'stakeholder consultation', 'pro-poor initiatives', 'action research', 'sustainable livelihoods', 'community-focused', 'bottom-up approach', 'demand-response' and so on. Sometimes there is a South African 'flavour', in which national issues of race, power and access to resources are referred to in a coded way. A recent advertisement for a meeting at a South African scientific research organisation included the following paragraph, which has elements both of development jargon ('evidence-based solutions' and 'strategic partnerships') and South African socio-economic code ('small-scale users' and 'elite capture'):

9. This underscores the importance of evidence-based solutions to use water as a catalyst for this reform by enhancing small-scale users' sustainable direct and indirect access to water for multiple uses. A legal challenge is to find solutions to prioritize water allocations to small-scale users in a non-formalistic manner, while effectively regulating the minority of large-scale users. Institutionally, informal but often vibrant small-scale water uses and local governance arrangements need to be understood, supported, and built upon for sustainably improving small-scale water users' access to water. For equitable strategic partnerships for large-scale irrigated agriculture, fair and transparent deals and processes are needed that avoid elite capture and conflicts.

Confusing language: problem

Confusing language by scientists or about science, no matter what the reasons for it, is more than just an annoyance requiring the reader to mentally 'translate' as they read each sentence; it has serious implications, particularly in South Africa.

Discrimination against second-language speakers of English

Most scientific communication in South Africa (and elsewhere) is in English. Confusing or jargon-rich language is much easier to decipher for mother-tongue speakers of English, who have heard the phrases before, or who understand rarely used polysyllabic words, arcane implications and obscure metaphors. Complex grammatical constructions (such as double negatives, persistent use of the passive tense and long sentences with many sub-clauses) are also easier for mother-tongue English speakers to handle. Second-language speakers of English, the great majority of South Africans, are at a disadvantage when faced with bewildering, jargon-rich English in its various forms and must divert extra time and energy to learning it. Equal access to scientific education and resources implies that the language of science be as accessible as possible. In some cases, the possession or adoption of a specialist language register, such as business-speak or management jargon, is seen as an accomplishment in its own right – quite reasonably, because acquiring it takes precious time and energy. Simply put, transformation in South African science may be unintentionally held back by the use of complex and confusing English.

The danger of losing sight of the original meaning and intention

In using obscure, complex language and jargon, we risk losing track of what we are trying to say. As long sentences, polysyllabic words and jargon pile up, the original point can get lost. Worse, the use of the complex language becomes an end in itself. This author once got an email from a senior colleague proposing a meeting, which, instead of an 'agenda', referred to:

10. An approximation to a requirements interpretation/project definition discussion document.

This took some time to decipher – and it was no surprise that the meeting itself was long-winded and did not reach a resolution. Instead of 'satellites', some geographers now talk about 'space-based remote-sensing platforms' – although the new term adds no extra meaning. As the writer Bill Bryson once joked, 'why call a spade a "spade" when you can call it a "manual earth-restructuring implement"?'[2]

In using – consciously or subconsciously – the style of another discipline or world-view to describe scientific work, we may also risk adopting the values or priorities of that world-view. If business-speak pervades our scientific communications, issues of cost-benefit or market-focus may jostle with the original reasons for the scientific research. If the language we use to describe our work is obscure and long-winded – perhaps to appear to carry more impact than it really does – then there may be a danger that the 'underlying' science is similarly murky. At the very least, baffling language distracts the reader (and possibly the writer too) from the original purpose of the writing.

The use of language to justify power hierarchies and exclude others

Some jargon or special language is needed by most professions, making it simpler to communicate and work. Lawyers have a specialist vocabulary, doctors use medical jargon, and car mechanics talk of 'diffs', 'turbo-lag' and 'pinking'. However, complexity and jargon is often unnecessary and may be being used only to signify importance and status. Much of the complex language of scientists or the 'management-speak' common in scientific institutions in South Africa is unnecessary – there are simpler and more neutral ways of speaking and writing. However, issues of power and control are at stake, and one disadvantage of plain speaking may be that it is easy to understand – and to criticise. For example, an impressive-sounding plan talking about 'market-driven mission-critical downsizing or streamlining, in alignment with current key institutional priorities and following extensive stakeholder consultation' may be a euphemism for a scheme to save money by firing workers – which is much less imposing and more easily challenged. Controversial decisions are often sugar-coated with layers of verbiage, and those who can write this way stand to gain from it – the language is a way for 'insiders' to bamboozle, impress or repel others, to maintain existing hierarchies, to deflect possible criticism and to avoid concrete statements. As mentioned, those who speak English as a second language are particularly disadvantaged.

Confusing language and school science teaching

The great majority of school pupils in South Africa do not speak English as a first language and many do not speak it very well at all, particularly at junior and junior secondary level. However, most school science classes are taught in English, partly because teaching materials are in English and partly because it is difficult to translate English scientific terms. There is a particular need for clear, simple English in science teaching materials at school level to help counter problems of poor English literacy. After all, if pupils find science subjects confusing and difficult they are unlikely to continue with them to high school level and beyond. The issue has national ramifications – as University of Cape Town Professor John Higgins[3] wrote:

> It is generally accepted that the capacity of a country in science and technology is directly related to its potential for development and progress and while this may be generally accepted it is only partially true. First of all it is essential to realise just how much basic literacy – the ability to read and write – contributes, and is indeed prior to, any particular training in 'science and technology'.

Unfortunately educational material for science teachers in South Africa does not always recognise the need for clear, simple language and more work needs to be done on this topic. Two examples are given below, both from textbooks meant for higher primary second-language speakers of English:

11. Passage A:
    The correct way for a Bunsen flame to be lit and adjusted is as follows: Ensure that all gas taps in the laboratory are closed.

Connect your burner to one of the gas taps by using a tightly fitting rubber tube. Completely open the stopcock on top of the supply cylinder. Light the match and open the gas tap to which the burner is attached. Keep the flame above the burner but not in the stream of air otherwise it will extinguish your match. Wait until the air in the delivery tube has been forced out. Now turn the sleeve slightly partially closing off the air supply to the flame and light the flame. With an insufficient air supply the flame burns with a yellowish colour. Regulate the sleeve to give a colourless flame.

12. Passage B:
How to light a Bunsen burner
[*A sketch of a Bunsen burner with labels referring to the steps below is provided*]
Step 1: Connect the Bunsen burner to a gas tap. Use a rubber tube to do this.
Step 2: Turn around the ring on the Bunsen burner so that the hole is quarter open.
Step 3: Turn on the gas and wait for the gas to push all the air out of the Bunsen burner.
Step 4: Light a match. Move the lit match towards the top of the Bunsen burner.
Step 5: Turn the ring on the Bunsen burner until the flame is dark blue on the outside and light blue inside.

Passage A has many unnecessary faults such as frequent use of the passive tense ('to be lit'), Latinate vocabulary ('ensure', 'extinguish'), unnecessary subordinate clauses ('Otherwise it will extinguish your match', 'With an insufficient air supply'), unclear vocabulary ('stopcock', 'sleeve') given that there is no diagram, vagueness ('partially' – how much is partially?) and long sentences (imagine trying to light a burner while reading Passage A!).

Passage B is supplied with a diagram with labels and the steps are short and clearly separated. Unnecessary details aren't included and the faults listed in Passage A are avoided (e.g. imperatives rather than the passive tense are used).

Clearer scientific writing

The best scientific writing is usually as short and simple as possible. (As Sand-Jensen[1] ironically says: 'Scientists know that long papers display one's great scientific wisdom and deep insight.') Write in the active tense, using short words and plain English where possible. Avoid jargon which is unlikely to be understood outside of a specialist community, unless the writing will genuinely only be read by that community. Most Latin words and phrases (*inter alia*, *ad hoc*, per annum, per se, etc.) are unnecessary, and acronyms should either be avoided or clearly explained in the text and in a separate glossary. Mixed metaphors are confusing: the following short sentence taken from a recent South African scientific report contains three metaphors in only 17 words:

13. The Toolbox builds on the wealth of experience held by water practitioners, specialists and decision-makers worldwide.

Consider the reader when laying out the document: Word processing software makes it easy to construct five or six nested subheadings, but it is virtually impossible for the reader to remember the reasons for the various levels when they get to section 3.2.5.IV(a), for example. Impressive-looking flow-charts with tens or hundreds of different possible connections between boxes are also easy to make, but can be almost impossible to decipher. Lists can be useful, but long bulleted lists may confuse or annoy readers. Make sure that the executive summary really does summarise the document, including the main results and conclusions. Executive summaries which are cut and pasted from text found later in the document are common but aren't very effective.

Language and vocabulary should be appropriate to the intended audience. Always remember that many readers will not speak English as a first language – and that the ordinary person is unlikely to understand complicated language, specialist terms or technical concepts. A recent instruction for completing a government science department form in South Africa reads as follows:

14. The use of 'not applicable' in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.

The writer appears to have been strongly influenced by legal jargon. There is no reason for using the word 'circumspection' instead of the much commoner 'care' or 'caution' (except perhaps to assert power and authority) and the rest of the sentence could have been designed to confuse or annoy the average reader.

Examples of clear science writing

There are many examples of simple, clear writing in or about South African science, in which the straightforward, personal writing style increases rather than diminishes the impact of the argument and leaves the reader wanting to read further. Here are two examples (not related to each other):

15. While I was training as an engineer in the late 1960s and 70s, the main emphasis of the training was on producing (and implementing) a cost-effective technical solution to a defined problem. Later we learned from experience that this was not enough. People did not necessarily buy the cars which the mechanical engineers designed, and they did not necessarily use the water and sanitation systems which civil engineers designed and constructed. These problems were compounded by the requirement that people would pay the full cost of the engineer's solutions, without government subsidy.[4]

16. As a country, South Africa believes in progress. It voluntarily puts disproportionate volumes of cash into luxuries. It buys overengined four by four recreational vehicles, multi-bathroomed houses and second homes at the sea. It does not invest sufficiently in productive capacity, or in infrastructure, or in the education of its children. After six years of positive GDP growth, the outcome is a consumer boom, not an investment in the future. For example, compared to the large numbers of expensive, luxurious vehicles, which deliver children to the schools of the rich of whatever skin colour, the scientific equipment of the country's universities is woefully undercapitalised and antediluvian. We fill double garages with back-to-back 4X4 V12s; we do not fill the universities with back-to-back mass spectrophotometers for proteomics and structural biology. The country's future depends on the mass specs, not on the 4X4s delivering five year olds to Grade One classes.[5]

The effect of these examples is to draw the reader in and hold his or her interest. The clear writing adds to the impact of the content and helps the reader to remember what has been said.

Conclusion

George Orwell, in his famous essay *Politics and the English language*, wrote that bad language has to be consciously resisted – it is all too easy to fall back on cliché and waffle.[6] It is up to each author writing about science to think clearly about the meaning to be conveyed and the simplest and clearest way of doing that. The danger of allowing confusing writing habits, self-important flannel and jargon in science to grow is that distrust of science may increase, goodwill will be lost, barriers to access will remain (especially those affecting second-language speakers of English) and we may even forget exactly what it is we were trying to say. The issue may seem a trivial one, but it can have serious consequences. At present there are few immediate rewards for clear, simple language, and many vested reasons for poor writing. Language issues can affect access to science education, ration access to power in scientific institutions, discourage debate and perpetuate unfair hierarchies based partly on the arbitrary grasp of a particular style. At the very least, poor language can bore and irritate readers, who quickly lose interest in what is being said.

Modern scientific research is often complex, but it doesn't necessarily require difficult-to-understand writing for its value and importance to be communicated. The reverse is frequently true. As scientists, we should complain about the worst cases of poor writing, rather than keeping quiet for fear of being thought unsophisticated. In the same way as the little boy in the fairy tale was the only person to laugh when the Emperor paraded naked in his 'new clothes', we ought to trust our common sense and complain when given needlessly convoluted reports, scientific strategies, management plans or articles filled with unnecessary jargon, waffle, buzzwords, complicated grammar and clichés.

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References

1. Sand-Jensen K. How to write consistently boring scientific literature. Oikos. 2007;116:723–727.
2. Bryson B. Mother tongue. London: Penguin Books; 1990.
3. Higgins J. Paying lip-service to academic freedom. Scrutiny2. 2000;5(1):4–15.
4. Bos A. The role of engineers in the demand responsive approach: A case study from South Africa. Leicester: Water, Engineering and Development Centre, Loughborough University; 2001.
5. Christie R. Successes and failures in the development of science and technology in South Africa. Paper circulated in advance of the CSIR Sixtieth Birthday Symposium. Cape Town: University of the Western Cape; 2005.
6. Orwell G. Politics and the English language. 1946. Reprint: Orwell G. Selected writings. London: Heinemann; 1970.