8 July 2013, 6.46am AEST

**It’s time we draft Aussie Rules to tackle Indigenous mathematics**

When discussing how to embed Indigenous Australian knowledge and practices into the Australian national curriculum effectively - particularly the maths curriculum - there’s no better place to start than analysing our own distinctively Australian national sport: AFL, the winter game. Why, you might ask…

**Author**

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**[Christine Nicholls](http://theconversation.com/profiles/christine-nicholls-34254)**

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Mathematics and Aussie Rules have quite a lot in common, which should be used when considering curricula for Indigenous – and non-Indigenous – students. AAP

When discussing how to embed Indigenous Australian knowledge and practices into the Australian national curriculum effectively - particularly the maths curriculum - there’s no better place to start than analysing our own distinctively Australian national sport: AFL, the winter game.

Why, you might ask. Well, have you ever wondered why Indigenous players frequently [excel at Aussie Rules](https://theconversation.com/what-if-indigenous-australians-didnt-play-footy-5964), where they are vastly over-represented in the national AFL competition?

In populist discourse, the exceptional ability of some Indigenous players is frequently ascribed to “natural talent”. This is actually a soft racism, uncomfortably akin to the Social Darwinism expressed via the [now-infamous “ape” comment](https://theconversation.com/the-ape-insult-a-short-history-of-a-racist-idea-14808) directed at a gifted Indigenous player during a recent AFL match.

The interrelated concepts of “natural ability” and “genetic endowment” are ultimately furphies, because they fail to take into account learned cognitive factors routinely brought into play by some Indigenous AFL players - and the hard work that goes into their success.

**Elite footballers aside …**

This apparently remarkable aptitude on the AFL field is readily observable in matches between groups of young Aboriginal men who live in Australia’s remote rural communities.

Throughout most of the 1980s and into the early 1990s I lived and worked, mostly as school principal, in such a desert community, the [Warlpiri](http://www.anu.edu.au/linguistics/nash/aust/wlp/index.html) settlement of Lajamanu in the Tanami Desert about half way between Alice Springs and Darwin. Along with other community members, I revelled in watching the home games, in which young Warlpiri men played dashing, thrilling football.

The seemingly superhuman exploits of the youthful, although mighty - according to local graffiti - Lajamanu Swans, who played electrifying footy in their bare feet on a dusty and grassless “oval”, a circular tract of rock hard red earth, is something I’ll never forget.

Football at Balgo Hills, Western Australia. yaruman5

Even smaller kids frequently showed outstanding skill in their capacity to grab hold of an airborne Sherrin flying from any direction whatsoever, while running at full pelt, and in their ability to find a passage through a narrow corridor, and in the finely tuned accuracy of their near-vertical jumps.

In what ways might Indigenous youths’ early childhood learning experiences and socialisation patterns lead to greater-than-average success in the game of AFL? Before attempting to answer this question, it is necessary to identify what makes the Australian game unique as a game of football.

**How AFL stands apart**

Unlike other football codes AFL does not have an offside rule, making it a multi-directional sport.

Moreover, it takes place on a very large oval-shaped field, requiring of players 360° of spatial consciousness, with the need to update and re-align oneself in space continuously, with split-second judgement and timing. The requirement of 360° spatial cognisance and responsiveness, a byproduct of the no-offside rule, is arguably AFL’s most salient feature, differentiating it from other football codes.

Indeed, one of AFL’s two major antecedents is an Indigenous Australian game with demonstrable kinship connections to today’s AFL (the other one is Irish Gaelic football). As the late Paddy Patrick Jangala, the first professional Warlpiri linguist, attested in the [Warlpiri Dictionary Project](http://books.google.com.au/books/about/Warlpiri_Dictionary_Project.html?id=r93_XwAACAAJ&redir_esc=y) in 1987:

Purlja, ngulaji yangka kalalu ngurrju-manu nyurruwiyi wita japujapupiya wampanajangka, wirrijijangka, manu janganpajangka wirrijijangka yumurrujangka. Ngulaji kalalu panturnu kankarlarrakari ngulakalalu puuly-mardarnu manu kalalunyanu warru kujurnu yapangku. Yarlpurrukurlangumiparlu. Yangka purljangkaji manyungka.

[Purlja is a small ball, which they used to make in the old days from string spun from wallaby fur and from possum fur. They used to kick it up in the air and then grab hold of it and throw it around to each other. Only age-mates (yarlpurrukurlangu) played on the same team. That is when they played with the “purlja”.]

So, for what precise reasons do so many Indigenous players find the 360° attribute of the game to be such a good fit, in cognitive terms? Traditional Aboriginal mathematical systems are largely founded upon spatial relationships rather than on numbers, which is the case in Australia’s dominant culture.

**A different spatial outlook**

Australia’s Indigenous languages are rich in spatial terminology. As linguist [Mary Laughren](http://www.uq.edu.au/uqresearchers/researcher/laughrenm.html) once [noted](http://130.203.133.150/showciting;jsessionid=6521F38915C653F339261DE30D50DB53?cid=8651210):

Desert children’s ability to handle directional and spatial terminology in particular is taken as a sort of intelligence test similar to the counting prowess test among Europeans.

This ability, to handle sophisticated terminology about space and directionality with confidence and accuracy, and the concomitant skill in land navigation even when one is completely surrounded by desert, is inculcated into children from the earliest infancy, even today. My own observations based on more than a decade of living at Lajamanu confirm this, and the former principal of Yuendumu School, Pam Harris, has written about it [extensively](http://trove.nla.gov.au/work/153171619?versionId=166928481).

[](https://c479107.ssl.cf2.rackcdn.com/files/26933/area14mp/bbtz4x4h-1372987045.jpg)Wide open space, with few landmarks, near Lajamanu. Christine Nicholls

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Preschoolers, only two or three years of age, could confidently name all the cardinal directions by the time they entered school and instantly apply them with almost 100% accuracy no matter what environment they found themselves in – a learned skill essentially deictic in nature, that most children in our dominant culture Australia are still struggling with at 15 or 16 years of age.

[Wendy Baarda](http://www.abc.net.au/4corners/special_eds/20090914/language/), a teacher and linguist who has been living for many years at the Warlpiri settlement of Yuendumu (where little Liam Jurrah, and many others like him, first kicked a footy) drew attention to this commonplace linguistic and deictic ability in the following anecdote:

One of the school’s Warlpiri Literacy workers was walking along carrying her baby who was about 18 months old. A bystander (another Warlpiri adult) called out to the child to get its attention. The child heard the voice but could not locate the person, so the speaker called out again, this time supplying the direction in which the child should look: ‘Kakarrarni’ - towards the east. Immediately the baby turned its head and looked in the right direction, towards the speaker.

One important difference, in relation to the dominant culture of this country, is that a person’s limbs (“left” or “right”) are not to be regarded as fixed entities in relation to self, as is implicit in the formulations “left” and “right”. Rather, they are conceived within a much broader context of spatial relationships with respect to the exterior world. So, in accordance with the specific spatial circumstance, a person might talk about one’s north, south, east or west hand (or leg).

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When one is continually on the move (or run) within 360° of open space, albeit with the intention of reaching specific goalposts within that space, the formulations of “left” and “right” in relation to one’s own body have little or no meaning. This form of spatial apprehension is not restricted to people in the Central or Western Deserts of Australia, but ubiquitous throughout Aboriginal Australia, and as a method of orienteering one’s way through space, survives even where the local languages are faltering.

The American linguistic anthropologist [John Haviland](http://www.anthro.ucsd.edu/faculty-staff/profiles/haviland.shtml) has [written](http://anthro.ucsd.edu/~jhaviland/Publications/ETHOSw.Diags.pdf) about the importance of cardinal directions for the Guugu Yimithirr (alt. Guugu Yimiddhir) people of Northern Queensland, in terms of position finding while in motion:

… Speakers of the Australian language Guugu Yimithirr (hereafter GY) at the Hopevale community near Cooktown, in far North Queensland, make heavy use in discourse about position and motion of inflected forms of four cardinal direction roots - similar in meaning to north, south, east, and west. The system of cardinal directions appears to involve principles for calculating horizontal position and motion strikingly different from familiar systems based on the anatomies of reference objects, including speakers and hearers themselves.

Rather than calculating location relative to inherent asymmetries in local reference objects, or from the viewpoint of observers themselves characterised by such asymmetries, the GY system apparently takes as its primitives global geocentric coordinates, seemingly independent of specific local terrain and based instead on horizontal angles which are fixed, as it were, by the earth (and perhaps the sun) and not subject to the rotation of observers or reference objects.

[](https://c479107.ssl.cf2.rackcdn.com/files/26940/area14mp/cx9kzy57-1372988766.jpg)‘Salt on Mina Mina’ by the late Warlpiri artist Dorothy Napangardi. AAP

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While I have barely touched upon the complexity of these systems here, they have largely survived, not always in intact form, the vagaries of colonisation. Their survival is most evident in rural, tradition-oriented Aboriginal communities, but it persists across generations, following Indigenous diasporic movement into Australian country towns and big cities.

This culturally specific form of mathematical knowledge, intergenerationally transmitted, imparted in its most intact form via Aboriginal languages, plays itself out not only on the AFL field but in tradition-oriented Aboriginal art, and has an important role in other Indigenous knowledge.

The ability to apply such knowledge is a product of nurture, not nature – it cannot be genetically transmitted any more than it is possible to transmit concepts about number and computation to other little Australians, except via processes of acculturation.

**What are the educational implications?**

In February 2011 the Australian Institute for Teaching and Learning ([AITSL](http://www.aitsl.edu.au/)), a contributor to the Australian Curriculum, Assessment and Reporting Authority ([ACARA](http://www.acara.edu.au/default.asp)), released a document titled [National Professional Standards for Teachers](http://www.aitsl.edu.au/verve/_resources/AITSL_National_Professional_Standards_for_Teachers.pdf). One of AITSL’s key categories was titled “Professional Knowledge”. Its Standard 2, which reads:

Know the content and how to teach it

has several subsections, of which Focus Areas 2.4 and 2.5 are relevant in this context.

Focus Area 2.4 reads as follows:

Understand and respect Aboriginal and Torres Strait Islander people to promote reconciliation between Indigenous and non-Indigenous Australians

while AITSL’s Focus Area 2.5 has as its major thrust Literacy and Numeracy strategies. The idea of an integrated curriculum is thus intrinsic to the conceptual approach mandated by those charged with overseeing the writing of the as-yet not-fully-rolled-out (or even completed) [Australian National Curriculum](http://www.australiancurriculum.edu.au/).

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Nonetheless, educators contributing to, writing and implementing these national curricula will be expected to “embed” literacy and numeracy strategies as well as Indigenous knowledge/s into diverse subject areas, including English and the arts.

Such a cross-curricula approach means that into the foreseeable future Australian maths and science education will need to be conceptualised outside of what are often perceived as those disciplines’ own self-referential silos.

There is an opportunity here to include such Indigenous knowledge in the new mathematics and science curricula, especially. There are many potential applications for spatial analysis in fields beyond the playing field: in computer science, mining, astronomy and many fields of research. It will enrich all Australian children to learn a little about Indigenous mathematics in the new curriculum, and will provide Aboriginal kids living in “outback” Australia and others too, a real chance to shine.

We have a clear choice here. The easiest, most likely option is for teachers implementing the new national curriculum to pay mere lip service to such integrated curriculum approaches.

The more difficult pathway will involve taking these ideas and shaping them into a curriculum that goes beyond inclusion of “Indigenous perspectives” but foregrounds “Indigenous knowledge” at the level of the episteme.

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[**Kerri Worthington**](http://theconversation.com/profiles/kerri-worthington-11079)

housekeeper

Referring to one's own 'left' and 'right' in spatial terms makes so much sense, far less confusing. But let's not hold our breath for this type of maths to be taught in all schools. The national curriculum may talk about understanding aboriginal cultures but it's not the same thing as actively incorporating their mathematical systems etc into mainstream programs.

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Kerri Worthington](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_182956)

Thank you for this comment, Kerri. I guess it's difficult to understand the extent to which our own cultural understandings are highly specific to our own culture, when we're so deeply immersed in it.

As I've written: One important difference in relation to the dominant culture of this country is that a person’s limbs, ‘left’ or ‘right’, are not to be regarded as fixed entities in relation to self. Rather they are conceived within a much broader context of spatial relationships - a person might…

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As long ago as 1768 the German philosopher Kant wrote:

...Even our judgements about the cosmic regions are subordinated to the concept we have of regions in general, insofar as they are determined in relation to sides of the body...However well I know the order of the cardinal points, I can determine regions according to that order only insofar as I know towards which hand this order proceeds...and the most complete chart of the heavens, however perfectly I might carry the plan in my mind, would not teach me, from a known region, North say... [I still need to know] on which side to look for sunrise...this position is also determined...relative to my hands. Similarly, our geographical knowledge and even our commonest knowledge of the position of places, would be of no aid to us if we could not, by reference to the sides of our bodies, assign to regions the things so ordered and the whole system of mutually relative positions.   
For a footballer continually on the move within 360 degrees of open space the formulations of ‘left’ and ‘right’ in relation to one’s own body often have little or no meaning.   
But of course, in pre-contact days when Central and Western Desert Aboriginal people were navigating their way around the desert surrounded by 360 degrees of open space, the concepts of 'left' and 'right' are absolutely meaningless, and if they didn't use the cardinal directions no one would have survived.   
The same applies to the early colonial sailors who from time to time found themselves surrounded by 360 degrees of open sea - but they have equipment (compasses, astrolabes etc) to guide them...

This way of perceiving space is also clearly premised on people living outdoors a good deal more than is possible today with most people living in cities, surrounded by buildings/the built environment...

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carer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183016)

The cardinal points as such would not have existed pre-contact days either.

I would think that all no-urban communites etc in the dim past would have developed their own systems for distance, direction and travel.

Studies into the use of the sun, moon and stars shows how important these were.

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In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183017)

Dear Stephen,

Thank you for your comments. On one point I can absolutely assure you: and that is that the cardinal points definitely existed in pre-contact days.   
For example, a medical doctor called David Lewis travelled with some first-contact Aboriginal men around the desert as far as Lake Mackay (Wilkinkarra) and recorded them as saying: "We knew north, south, east and west before the white man and his compass."

I'd be happy to send you the references if you wish to follow this up!

Best wishes

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carer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183031)

I'm not arguing that were not in existence - in fact Wikkipedia says that indigenous Australians had as many as 6 "cardinal" points.

My point is that although I.A. (and others societies of the time) used these reference points, they would have not been N.E.W.S and left and right....but words or symbols representing their indication of direction.

We use the word "north" to indicate direction and other references, but north would be mean nothing in pre-contact days.

Perhaps we are arguing semantics.

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183017)

So the sun didn't rise and set in pre-contact days?   
I've lived on Yuendumu for ages and have marvelled at the rapid fire "kakarara", "yatijarra" etc (East North) so much more tactically useful than the two dimentional "give it here".   
Our preocupation with the North arrow I think derives from the ancient dicovery of the lodestones.   
Warlpiri people tend to align maps according to the real attitude of the land the maps represent.   
Yes indeed they had no north south east and west, they had no English at all.

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In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183240)

Excellent & relevant post!

Regarding the way 'the west' understands the cardinal directions, it is VERY different from what you describe - for example, let's be specific, in The Australian, (Tuesday February 21, 2012, SPORT Section, p 44), there was a photograph of an aggrieved-looking (the late lamented Australian cricket captain) Ricky Ponting. On the previous day Ponting had been ‘dumped’ (to use the word used by the journalist Peter Lalor in his accompanying article on the same page) from…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Regarding the way 'the west' understands the cardinal directions, it is VERY different from what you describe - for example, let's be specific, in The Australian, (Tuesday February 21, 2012, SPORT Section, p 44), there was a photograph of an aggrieved-looking (the late lamented Australian cricket captain) Ricky Ponting. On the previous day Ponting had been ‘dumped’ (to use the word used by the journalist Peter Lalor in his accompanying article on the same page) from the Australian Cricket Squad after being unable to reach double figures in 5 consecutive one day innings. The caption   
for the photograph read:

“Veteran Australian batsman Ricky Ponting’s one day international returns have taken a sharp turn south in 2012.”

Well, 'up' and 'down' are NOT the same as north and south as you know Frank!

+ Alan Koehler on the ABC - often says that shares/ the Australian dollar (etc etc) are going north/south...

This kind of discourse about a rigidly fixed 'place' of north/south is based on a very static view of the cardinal directions - this isn't the conceptualisation that I'm advancing here as you know, Frank, as a long term fluent Warlpiri speaker...

More posts from you please...and more too from the Yurntumu-wardingki.

Ngurrju-jala!

4 months ago [report](http://theconversation.com/comments/183293/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183293)

Far from fluent. Warlpiri is far more complex for an adult to master not least because it encompasses such a different worldview which your article touches on. European languages and thinking have a great emphasis on time, Australian Aboriginal languages and thinking on the other hand (left or right?!) are thoroughly spacial. It is this space/time difference which is a root cause of much misunderstanding, lack of communication and ultimately unjust ethnocentric assimilationist policies Aboriginal Australia has been and continues to be subjected to by the dominant culture.   
As for postulating that spatial thinking is behind AFL footy prowess is a stroke of genius. Thank you for one of those "why didn't I think of that? " enlightening moments Christine!

4 months ago [report](http://theconversation.com/comments/183834/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**terry lockwood**](http://theconversation.com/profiles/terry-lockwood-3084)

maths teacher

Fascinating stuff, Christine.   
With the increasing use of GPS for navigation, I suspect cultures around the world will become even less familiar with the natural cues for direction. I navigate by the sun when i am in unfamiliar territory.

It might also be a bit of a stretch to suggest that 'Joe Public' really thinks that the Indigenous players' spatial ability is genetic as opposed to cultural. I don't think Joe thinks that deeply.

It would be interesting to see Indigenous players try to teach other players how they see the world spatially. Would the recipients be receptive? Can it be articulated? In my experience of working with footballers and the geometry of goal-kicking, they are a conservative lot.

4 months ago [report](http://theconversation.com/comments/182965/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [terry lockwood](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_182965)

Hello Terry,

It is difficult to take issue with anything you've said here - I agree with every word.

Especially, I agree with your thoughts about the putative loss of touch with cardinal directionality on the part of the dominant culture - this continuing lack of familiarity with cardinal directions as a navigation aid, and knowledge resource, will result in a wider cultural loss...

It is time to accept Indigenous people as teachers about a differently-conceptualised approach to mathematics, not placing them as perpetual learners - before this globally endangered knowledge actually disappears, for want of acknowledgement..

4 months ago [report](http://theconversation.com/comments/183295/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [terry lockwood](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_182965)

You are right Terry about the navigation aids that we use today perhaps interrupting the normal cognitive processes we use for getting around...

this is on reason why knowledge of spatial terminology, and how to apply it, will never become truly redundant, and there's still a lot to learn from   
'traditional' Aboriginal mathematical systems...

4 months ago [report](http://theconversation.com/comments/183724/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Mal Jones**](http://theconversation.com/profiles/mal-jones-102186)

Turf Manager

In reply to [terry lockwood](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_182965)

And I was good at singing and picking up on syllables much more quickly than my peers at a young age.. My older sister is a terrible singer.. so is this also nurture?

Why has my sister -given more years of exposure to possible sources to learn music from - blurted out such poorly controlled and aimed notes and stuff..?

When I, before school age amazed people with my abilities..

People who have a head injury sometimes lose the ability to control their voice well.

I'm not foolish for thinking there may be a genetic component to the skills people have.. Nurture can help an awful lot.

Could a simple test for auditory/ visual / kinesthetic preferences help here.

I think the author of this article mentioned that some indigenous Australian children demonstrated a better use of their visual memory.. most people are visual.. so in that case the kids had simply been taught to nurture a skill more people could learn too.

2 months ago [report](http://theconversation.com/comments/208167/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

Fascinating, but don't know if this is just a long bow drawn to hit a pre-determined target, or not.

After all young "white" kids have been kicking footballs around for a century or so and many are duds at mathematics.

If many "black" kids (male of course) had to choose b/w footy and mathematics, I would bet on the choice.

4 months ago [report](http://theconversation.com/comments/182981/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**terry lockwood**](http://theconversation.com/profiles/terry-lockwood-3084)

maths teacher

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_182981)

I assure you that most white kids will choose maths over footy too Stephen.

4 months ago [report](http://theconversation.com/comments/183002/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

In reply to [terry lockwood](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183002)

well there we disagree Terry........

footy pays more.

4 months ago [report](http://theconversation.com/comments/183005/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**terry lockwood**](http://theconversation.com/profiles/terry-lockwood-3084)

maths teacher

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183005)

silly me I did mean footy over maths - i should check more carefully before hitting 'post comment'

4 months ago [report](http://theconversation.com/comments/183121/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

In reply to [terry lockwood](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183121)

I thought you may have, but as a maths teacher, I thought you also may be defending your territory.

cheers.

4 months ago [report](http://theconversation.com/comments/183123/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Sean Manning**](http://theconversation.com/profiles/sean-manning-12663)

Physicist

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183005)

Football only pays more if you apply a flawed statistical analysis. If you take the average income for all people who pursued only football as a career (not only the successful people) and compared it to the average income for all people who pursued mathematical careers (not just mathematicians but anything inherently quantitative and therefore requiring a solid mathematics education) I am quite sure you will be proven wrong. Simply put, mathematics provides you with more options for your career and a longer career.

4 months ago [report](http://theconversation.com/comments/183169/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

In reply to [Sean Manning](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183169)

Happy to be proven wrong.........

4 months ago [report](http://theconversation.com/comments/183374/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_182981)

Hello Stephen,

Perhaps if we broadened the idea of what actually constitutes 'mathematics', not so many kids would be 'duds' (as you put it) in that area?

4 months ago [report](http://theconversation.com/comments/184894/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Sean Manning](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183169)

Agreed Sean...and in addition mathematicians working in all of the applied fields to which you allude do not routinely end up with arthritic bodies in middle age and beyond, as a result of too much contact sport...

4 months ago [report](http://theconversation.com/comments/184895/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Ben Cooling**](http://theconversation.com/profiles/ben-cooling-94105)

Web Developer & Programmer

Attempting to subscribe some intrinsic significance between the author's elected code of choice and the indigenous population comes across as unconvincing proselytizing. The article does have some interesting points that would have been better served decoupled from AFL centric rhetoric.

4 months ago [report](http://theconversation.com/comments/183043/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

In reply to [Ben Cooling](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183043)

To me it sort of outlines the obvious.......I mean coastal communities eons ago new about marine travel, ocean currents and direction etc

Agrarian communities new about farming techniques, seasons and crops.....etc

The skills were not representative only of black, white, yellow or brown etc.

4 months ago [report](http://theconversation.com/comments/183048/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Ben Cooling](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183043)

Hello Ben,

Thank you very much for your comment, and I agree with your point about the perils of oversimplification. I'd like to assure you first that in putting forward this view, I don't hold any particular candle for AFL - but the point made here us that AFL IS unique in its 360 degrees field coverage enabled by the \*absence\* of an offside rule. (I was largely brought up in Sydney at a time when Rugby really ruled and went to see my brother playing Rugby Union for his school and had never even…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Hello Ben,

Thank you very much for your comment, and I agree with your point about the perils of oversimplification. I'd like to assure you first that in putting forward this view, I don't hold any particular candle for AFL - but the point made here us that AFL IS unique in its 360 degrees field coverage enabled by the \*absence\* of an offside rule. (I was largely brought up in Sydney at a time when Rugby really ruled and went to see my brother playing Rugby Union for his school and had never even seen an AFL game before going to the NT.)

And in putting forward this argument, it is also obvious that a person’s body type, physiology and physical fitness all play significant roles in any sporting achievement. On top of this, attributing such sporting prowess to ‘natural’ skill with which a person is endowed at birth detracts from the inevitable sheer hard work that goes into such attainment, no matter who the players may be. So all of these caveats need to be taken into account...difficult in a very short article!

4 months ago [report](http://theconversation.com/comments/183056/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183048)

Hello again Stephen,

To follow up again you may be interested to read the 1994 book 'Macquarie Aboriginal Words

(<http://trove.nla.gov.au/work/23178838>),

which lists (obviously pre-contact in origin) vocabularies from many Australian (the linguistically correct name for the 250 or so distinct Aboriginal languages that were in situ in Australia BC - Before Cook) all around Australia, and many of these have words for the cardinal directions 'north', 'south' 'east' and 'west', indicative of the rich spatial terminology in this area - I think that you would find it fascinating.

4 months ago [report](http://theconversation.com/comments/183080/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Ben Cooling**](http://theconversation.com/profiles/ben-cooling-94105)

Web Developer & Programmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183056)

Thanks Christine, I did enjoy your article and view point. I think there is a lot of value to be found in finding the intersection between sport & academia, braun & brain etc instead of conceiving it as an unassailable dichotomy. On the flip side, I think this could also only foster a more sophisticated & genuine dialogue around sport as well; perhaps one day the lazy 'natural skill' cliche you mentioned could even be retired?

Having said that I'm not convinced of how or even why the AFL needs…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thanks Christine, I did enjoy your article and view point. I think there is a lot of value to be found in finding the intersection between sport & academia, braun & brain etc instead of conceiving it as an unassailable dichotomy. On the flip side, I think this could also only foster a more sophisticated & genuine dialogue around sport as well; perhaps one day the lazy 'natural skill' cliche you mentioned could even be retired?

Having said that I'm not convinced of how or even why the AFL needs to stand apart in the success of Indigenous people in sport. The obvious response to the attributes you listed (360 degrees spatial consciousness, lack of offside rule & large oval playing field etc etc) is to consider a code that doesn't have these. A staggering 35 per cent of the National Rugby League team, the Kangaroos, is of Indigenous origin. In the last four years, two different Indigenous people have won the Golden boot award for best player in the world.

There are no doubt numerous significant sporting Indigenous achievements to all sports, even outside the football codes; off the top of my head I think of Patrick Mills of the premier Basketball competition, NBA, who is a member of the Western Conference champion San Antonio Spurs team.

4 months ago [report](http://theconversation.com/comments/183084/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Martin Quirke**](http://theconversation.com/profiles/martin-quirke-18428)

Architect, Research Doctoral Candidate

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183056)

Interesting article Christine,   
I did find the link between maths and AFL a little tenuous. As you have hinted, perhaps this is partly due to 'conditioning' and resultant pre-conceptions. Maybe we need a diagrammed example?

I agree that a link does exist between mathematics and spatial cognition. Mathematical ability has been correlated with navigation ability in the sport of orienteering (e.g. Notarnicola et al. (2012)) Perhaps this could strengthen your proposition re spatial comprehension from a global (cardinal), rather than relative (object / person) centered point of view, as simply another form of mathematical cognition?

Again, as you point out: the key will be in finding a meaningful way to immerse this into curriculum so footy obsessed kids feel more engaged with the content : diagramming football strategies in maths class perhaps?

4 months ago [report](http://theconversation.com/comments/183105/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Ben Cooling](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183084)

Thanks Ben.

There are other ways of applying similar Indigenous knowledge to other sports, especially when it comes to factoring in wind direction, which also has a pronounced effect on certain (outdoor sports). This can be applied to Rugby, athletics etc as well.

For more info. on this please see the acclaimed Australian linguist David Nash's recent article on Indigenous terminology relating to wind direction :

<http://www.tandfonline.com/eprint/7weYMqJeF5fye7IghFVR/full>

and let us know what you think!

4 months ago [report](http://theconversation.com/comments/183111/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**terry lockwood**](http://theconversation.com/profiles/terry-lockwood-3084)

maths teacher

In reply to [Ben Cooling](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183043)

'cept that any mention of AFL makes me wanna read it. Sorry!

4 months ago [report](http://theconversation.com/comments/183122/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

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Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Martin Quirke](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183105)

Hello Martin,

Thank you so much for this post, which I've been thinking about over the past 24 hours.

As an architect, are you interested in producing such a diagrammatic model of (AFL) football strategies?

I think that you are into something there, and that could be very useful...

More later...

4 months ago [report](http://theconversation.com/comments/183850/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Mal Jones**](http://theconversation.com/profiles/mal-jones-102186)

Turf Manager

In reply to [Ben Cooling](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183084)

Some people do have natural skills and some people do not.

Unfortunately the awesome bowler Alan Donald from South Africa put his energy into helping an ugly (styled) bowler from New Zealand who should not receive that privilege. The bowler should have been directed into a different field than sport because he is not good to watch..

He received lots of coaching and camps in his youth like a spoilt brat.

There are people who can't help but move well to the music when they hear it. This…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Some people do have natural skills and some people do not.

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He received lots of coaching and camps in his youth like a spoilt brat.

There are people who can't help but move well to the music when they hear it. This guy is obviously not one of them.

People do have natural gifts. And some people from particular regions of the world do tend to demonstrate unique physical traits. I mentioned that before. E.g. lack of pubic hair on Asian people. Wide feet.. etc

I don't want to go and watch the cricket when it is full of snobs who are only there because they come from privileged back grounds.

They are eating up spots that should be vacated for their rightful owners.

Some people are auditory/ some are kinesthetic/ the vast majority of ordinary people are visual.

Know your place in this world and play to your strengths.. Don't steal someone else's limelight..

2 months ago [report](http://theconversation.com/comments/208174/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Mal Jones**](http://theconversation.com/profiles/mal-jones-102186)

Turf Manager

In reply to [Martin Quirke](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183105)

Rather than boring the whole class with football perhaps the coaches could impart some maths knowledge to the kids.

When I took up cricket the other kids knew about calculating their averages and so on many years before we learnt it in highschool.

Up skill the coaches and the teachers and start paying them better and stuff. Coaches do it for free with young ones but go for qualifications.

2 months ago [report](http://theconversation.com/comments/208175/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Mal Jones](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_208174)

There's no doubt that individuals have their own particular abilities. Those abilities could be inherited as a genetic predisposition or taught because they are valued within a particular community. Regardless of the source of one's ability, if one is particularly adept at something, such as music, maths or spatial ability, then others could potentially learn from them. However, a problem arises when one society does not understand or appreciate the natural abilities possessed by people of a different…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

There's no doubt that individuals have their own particular abilities. Those abilities could be inherited as a genetic predisposition or taught because they are valued within a particular community. Regardless of the source of one's ability, if one is particularly adept at something, such as music, maths or spatial ability, then others could potentially learn from them. However, a problem arises when one society does not understand or appreciate the natural abilities possessed by people of a different culture, even as they go about trying to "assimilate" those very people. Why should a person "play to their strengths" if those strengths have little value in the dominant culture? Or perhaps those strengths would be valued if they were better understood and their value able to be realised, which is, I think, the point being made by Dr Nicholls. Would you agree?

Or are you saying that people are different and it doesn't matter if you're black or white or any other color, and that some Aboriginal people might have a natural spatial ability while others don't. I would agree that people vary in the strength of their abilities, but on the whole, we form skills in areas our community values.

As babies, we were able to form the sounds of every language on earth, but by the time we mastered our native language our ability to form the unique sounds of other languages was diminished. So sometimes we're born with abilities that are extinguished over time simply because our community or family doesn't need or value them.

about 1 month ago [report](http://theconversation.com/comments/211851/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183850)

Here's a website entirely dedicated to football diagrams, chalkboards and graphs: <http://www.zonalmarking.net/>

about 1 month ago [report](http://theconversation.com/comments/211949/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Gail Carnes](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_211949)

Yes, thank you, I checked this link out early this morning - it throws an interesting light on some of the differences between soccer as a football game and Australian Rules.

I'm not sure whether anything has been attempted in relation to the vectors involved in Australian Rules (AFL) footy, because studying the vectorial qualities of the game both in terms of ball movement and human movement around and across the field, as well as back and forwards, and representing these diagrammatically would potentially add to the knowledge base in this instance. Frank Baarda commented earlier about Warlpiri facility in vector addition, that he observed whilst working with the men in his capacity as a geologist based at Yuendumu, and Martin Quirke, an architect who commented earlier in this discussion, also made a comment related to this matter of mapping the movement.

I wonder if Martin Q. would be interested in taking it further and working on a diagrammatic representation thereof?

about 1 month ago [report](http://theconversation.com/comments/212108/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Donald Richardson**](http://theconversation.com/profiles/donald-richardson-95148)

artist/writer

I don't know enough about either football (I had to look up 'offisde rule'!) or mathematics to comment on the thesis, but experience has shown me that we are unwise to discount either nature or nurture. Both footballers and mathematicians are both 'born' as well as 'made.'   
But I think that 3D acuity (the ability to note subtle land-marks) is the stuff of both successful hunting and the ability to make visual representations - which I have observed seems to be innate in some Aboriginal children (or learned early). Does diexis stretch to the making of art?

4 months ago [report](http://theconversation.com/comments/183064/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Donald Richardson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183064)

Yes, that's quite true about nature/nurture both having significant roles in this; it is also very obvious that a person’s body type, physiology and physical fitness all play significant roles in any sporting achievement, as does their personal psychology (ie drive to succeed) and also to put in the sheer hard work required for success.

And yes - I do believe that art making is to some extent at least (the unanswerable question is, to what extent?...this is impossible to quantify...) a demonstrably culturally anchored and deictic pursuit/endeavour...if you're interested I will post up some more info...thank you for your comment.

4 months ago [report](http://theconversation.com/comments/183097/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183097)

Christine, it would be interesting to check your theories against NAPLAN Mathematics results of these Aboriginal communities.

4 months ago [report](http://theconversation.com/comments/183102/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183102)

You're right about that David - it would allow tradition-oriented Indigenous kids (especially those who still speak their ancestral languages) to shine in the area of knowing and being able to apply cardinal directional terminology - and possibly lead to a less than impressive performance from those on the other side of the colonial divide...and the Naplan tests may also need to be translated into Indigenous languages to constitute a level playing field approach..perhaps a step too far for those behind the tests???

4 months ago [report](http://theconversation.com/comments/183116/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**terry lockwood**](http://theconversation.com/profiles/terry-lockwood-3084)

maths teacher

In reply to [Donald Richardson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183064)

FYI Donald, Australian Rules is may be more akin to basketball than soccer or rugby.

And I don't have any desire to understand the offside rule.

4 months ago [report](http://theconversation.com/comments/183129/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183116)

Actually, Christine, my point was that we already know how these communities perform in NAPLAN Mathematics tests. Abominably.

4 months ago [report](http://theconversation.com/comments/183137/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [terry lockwood](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183129)

Nonetheless, Terry, regardless of the team sport, almost all of them require an excellent sense of spatial apprehension, including soccer, Rugby, basketball, netball - it is just that AFL is par excellence, the sport that requires this 360 degrees awareness...and constant vigilance (whilst on the run, often) in relation to that 360 degrees of potential activity...

4 months ago [report](http://theconversation.com/comments/184901/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Steven Newton**](http://theconversation.com/profiles/steven-newton-12349)

Teacher, Student

Interesting article, however I am unconvinced that the path to "understand and respect Aboriginal and Torres Strait Islander people to promote reconciliation between Indigenous and non-Indigenous Australians" can be found in such simplistic yet tenuous linkage of dominant and non-dominant thinking within the Maths curriculum. Your last few paragraphs sum it up and I fear 'lip-service' is all many teachers will be able to offer as the national curriculum facilitates the inclusion but not the the 'embedding' of indigenous knowledge (or any other knowledge) and as far as education being 'conceptualized outside of what are often perceived as those disciplines’ own self-referential silos', this is a pipe dream whilst neo-liberal policies drive the education reform agenda.

4 months ago [report](http://theconversation.com/comments/183114/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Steven Newton](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183114)

Hello Steven,

Yes, I do take your point on this Steven, and think that (sadly)what you've written here represents the realpolitik of the situation. And of course no single initiative or idea can or will lead to Reconciliation. A range of different strategies and tactics will obviously need to come into play simultaneously. And most of all, \*\*\*recognition\*\*\* of these unique Indigenous ways of engaging with the world, whether that be mathematically, or in other fields, needs to be part of the…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Hello Steven,

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With respect to the very idea of 'reconciliation', I think that as a concept that is flawed in any case. Surely it should be 'conciliation' rather than 're-conciliation' ???

Reconciliation implies a once-harmonious relationship (like a marriage) that has now broken down, and needs mending, but that isn't the case in Australia in terms of the overall relationship between the colonised/colonisers, so I think that 'conciliation' is preferable language use here and language that more accurately nails what we should aspire to here - language use iin such tricky terrain needs to be really accurate, so that we are pursuing a clear goal.

But the fact that it may be hard to achieve such a goal doesn't let us off the hook, & shouldn't be a reason for inaction - we need to try to achieve small achievable goals. Surely it isn't too difficult to include some Indigenous maths in the curriculum? That's what the educational authorities are saying they wish to do anyway...

4 months ago [report](http://theconversation.com/comments/183234/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Steven Newton**](http://theconversation.com/profiles/steven-newton-12349)

Teacher, Student

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183234)

I agree with the 'conciliation' argument yet am troubled by your last paragraph. I am also a little troubled by the fact that it seems par for the course in this type of discussion to roll out the time spent working and living in indigenous communities as some sort of 'credential' on the topic, I have too, and people, its not!

However, I agree, a hard to achieve goal shouldn't be the reason for inaction but the act of doing something isn't synonymous with achieving something.

I personally…

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I agree with the 'conciliation' argument yet am troubled by your last paragraph. I am also a little troubled by the fact that it seems par for the course in this type of discussion to roll out the time spent working and living in indigenous communities as some sort of 'credential' on the topic, I have too, and people, its not!

However, I agree, a hard to achieve goal shouldn't be the reason for inaction but the act of doing something isn't synonymous with achieving something.

I personally don't believe its too difficult to include some indigenous maths in the curriculum, but to what effect really? Have the powers that be thought it through? discussed it with all stakeholders?

I have a strong critical pedagogical background and believe in the concept at the heart of the initiative but significant changes are required at many levels of society AND education before this type of initiative can move beyond an add-on to really become included. If it stays at the level of a curriculum add-on, it simply perpetuates the marginalization and alternate status of indigenous knowledge.

4 months ago [report](http://theconversation.com/comments/183302/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Steven Newton](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183302)

This is an academic network aimed at putting forward ideas to others about ideas, and ideas lead to possible courses of action.

What are the possible courses of action that you view as more potentially more effective?

4 months ago [report](http://theconversation.com/comments/183307/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Steven Newton**](http://theconversation.com/profiles/steven-newton-12349)

Teacher, Student

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183307)

My greatest concern is that while academia puts forward ideas, it is generally others who implement the courses of action. Politicians who change the course of action to suit budgets, teachers who change the action to fit with the resources already purchased. A very cynical view I will admit, but am I wrong?

As you mentioned, reconciliation is perhaps an inaccurate term and I would argue the current view by many policy makers, principals, teachers is in itself inaccurate. You mention 'recognition…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

My greatest concern is that while academia puts forward ideas, it is generally others who implement the courses of action. Politicians who change the course of action to suit budgets, teachers who change the action to fit with the resources already purchased. A very cynical view I will admit, but am I wrong?

As you mentioned, reconciliation is perhaps an inaccurate term and I would argue the current view by many policy makers, principals, teachers is in itself inaccurate. You mention 'recognition of other ways of being in the world' and I am concerned that there is indeed a general lack of awareness or recognition that other perspectives hold value, or even exist. Schools are very very traditional places, and overall, I would argue that there are more similarities than differences between classrooms today and classrooms 30 years ago.

We continue to create initiatives that look alot like social justice without checking for a shared view of social justice. Just as celebrating NAIDOC Day can range from a wholly embraced inclusive event leading to lasting positive communicative exchanges between previously disconnected community members to a token gesture that allows the institution to highlight a students minority status, I am concerned that the addition of indigenous knowledge across the curriculum can be counterproductive unless we are all on board as to why and how, not just academia but those who don't know what they don't know.

I would advocate for initially, a curriculum that is self reflective, that develops an awareness of the ways in which power is created and maintained over generations. Perhaps changes to curriculum that starts in teachers college and flows back down to high school as those teachers graduate and then primary school so to construct a more socially aware generation. This is just an opinion at present, (and I know I'm generalizing however I am working to refine this into a re searchable topic) but I believe many young people, especially those at the higher end of the academic strata, are very susceptible to the mechanisms of dominant ideology and are viewing their education as a means to an end (a credential) and are uninterested in sojourns into pursuits disconnected to their finish line.   
Studies into understanding the nature of power, the ways in which knowledge is deemed worthwhile, is, in my opinion, required before other perspectives could find a meaningful place in the curriculum.

4 months ago [report](http://theconversation.com/comments/183346/abuses/new)

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[**Eva Cox**](http://theconversation.com/profiles/eva-cox-1012)

Professorial Fellow Jumbunna IHL at [University of Technology, Sydney](http://theconversation.com/institutions/university-of-technology-sydney)

Fascinating Chris, even without a clue about AFL. I did some work last year looking at various literacies to add to the mix for Indigenous early childhood learning and this stuff fits very neatly with my attempts to convince early childhood teachers that the gap between Indigenous children and others was often two sided rather than a deficit by one group. This article contributes nicely to the debates about how to recognise other epistemologies and understand other ways of describing what is. Then more Indigneous parents would not need to feel they are seen as having nothing to offer. Recognising alternate views allows exchanges between equals not filling up the gap with our views and assumptions

4 months ago [report](http://theconversation.com/comments/183176/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Eva Cox](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183176)

Thank you Eva for your post. You are quite right about the prevailing view being that the deficit is one-sided, rather than there being knowledge gaps on both sides. And there is the additional problem of not many people being able to disentangle what is culturally-received and inculcated knowledge, and innate knowledge. This was driven home to me many years ago at Lajamanu, when as school principal I had to administer an IQ test to all the kids in the school (at the time about 250). One of the items…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thank you Eva for your post. You are quite right about the prevailing view being that the deficit is one-sided, rather than there being knowledge gaps on both sides. And there is the additional problem of not many people being able to disentangle what is culturally-received and inculcated knowledge, and innate knowledge. This was driven home to me many years ago at Lajamanu, when as school principal I had to administer an IQ test to all the kids in the school (at the time about 250). One of the items showed an illustration of a plate, with a spoon, knife and fork randomly displayed around it, and the question asked the kids to arrange the cutlery around the plate in the "correct" order. At that point no one had forks, knives or spoons at Lajamanu, but barbequed everything on hot coals outside of their camps and ate it on tin plates, so no child in the entire school got the "correct" answer to that question, on which intelligence was based. There were other less obvious examples of that, too. However, had the kids been asked to arrange the cutlery to the north west of the way they were sitting in their desks and facing at that moment, almost all of the kids would have achieved a score - but h.m. 5-10 year olds in our town schools would have done so? I guess most would have failed miserably.

Regarding Aboriginal orientation through space, you might like to follow up by reading the following articles:

Lewis, D. (1976a), ‘Route Finding by Desert Aborigines in Australia’, in Journal of Navigation, 29:1, pp.29-31.   
Lewis, D. (1976b), ‘Observations on route finding and spatial orientation among the Aboriginal people of the Western Desert region of Central Australia’, in Oceania XLVI, no. 4, pp.249- 282.

All the best!

4 months ago [report](http://theconversation.com/comments/183401/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Eva Cox](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183176)

PS it struck me in retrospect that many young Australian kids of Asian background would have failed that assessment item too, if they had grown up using chopsticks...

4 months ago [report](http://theconversation.com/comments/183403/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183403)

The list of examples could be endless re this issue.

Many urban kids think milk comes from cartons (so they say).

Surely the most important issue with indigenous education is to allow I.A. to compete in the workforce. To be able to choose to become a footy player or a mathematician, or a ballet dancer.

4 months ago [report](http://theconversation.com/comments/183422/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183422)

Thank you Stephen!   
To compete in the work force, we need to be broadly educated people. I really don't understand what the problem is in including some knowledge from differing cultural groups (especially the cultures - plural - of Australia's original inhabitants) into the curriculum.

To continue discussing this in relation to maths:

The number strand, usually starting with counting, is routinely taught before other mathematical knowledge in mainstream Australian infants and primary school…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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To continue discussing this in relation to maths:

The number strand, usually starting with counting, is routinely taught before other mathematical knowledge in mainstream Australian infants and primary school classrooms, and is regarded as the basis of later mathematical learning;

Measurement, which is closely related to number, often involving computation and algorithms, is a similar priority in the mainstream curriculum;

The exploration of space and spatial relationships and accompanying terminology (cardinal directions, for example) is rather less of a curriculum priority - especially in the early years of the dominant culture’s mathematics curriculum.

Why not simply include the above in the mathematics curriculum?

There are many applications in today's world...which will ultimately make today's kids more competitive people. In the longer term, rather than focusing on a very narrow model of what 'maths' (or any other subject) actually is...we need creative thinkers, able to think outside of narrow parameters - the human future may depend on this capacity...

4 months ago [report](http://theconversation.com/comments/183706/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183403)

Except Christine Asian kids perform extremely well academically, even after migrating from as far away as China and Korea. They perform especially well in Mathematics. And yet, your Warlpiri kids perform atrociously.

4 months ago [report](http://theconversation.com/comments/184024/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jon Hunt**](http://theconversation.com/profiles/jon-hunt-9131)

Medical Practitioner

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184024)

I think you miss the point David. Asian kids do well because they are brought up in a different environment. The classical stereotype is that they study 25 hours per day. They have an arithmetical mindset. Aboriginal people are different which is an important point this article is trying to make.

4 months ago [report](http://theconversation.com/comments/184032/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

In reply to [Jon Hunt](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184032)

We're all different, and yet we are all the same in a zen sort of way.

Way back we all came from the same stock.

4 months ago [report](http://theconversation.com/comments/184033/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jon Hunt**](http://theconversation.com/profiles/jon-hunt-9131)

Medical Practitioner

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183401)

IQ tests don't necessarily take into consideration culture, education or environment. Why do the test in the first place? Were they trying to prove something?

4 months ago [report](http://theconversation.com/comments/184049/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184024)

As with all NAPLAN testing the result is dependent on the questions asked. When it comes to year three English for instance, I've often posed the question of how well would Melbourne kids go if their questions were posed in Warlpiri. This isn't even going into context.   
In this discussion I think the question of how can Indigenous knowledge and thought processes be included into a national curriculum so that all Australian children can benefit from this wonderful (but sadly almost not recognised…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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In this discussion I think the question of how can Indigenous knowledge and thought processes be included into a national curriculum so that all Australian children can benefit from this wonderful (but sadly almost not recognised) Australian resource (not just leavy it to AFL football to be the main beneficiary) is really worth pursuing. I don't think it will be easy.   
My wife taught for over three decades at Yuendumu, including the time when we had a successful bilingual programme. She tells me Warlpiri children have a remarkable visual memory (e.g. remembering which card was placed face down where out of a large selection).   
"Where's Wally?" is a piece of cake.   
Undoubtedly these are the same kids that perform atrociously.

4 months ago [report](http://theconversation.com/comments/184050/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184050)

"I've often posed the question of how well would Melbourne kids go if their questions were posed in Warlpiri."   
Well how do Melbourne kids from China, India, Argentina, and Iran do in NAPLAN?

4 months ago [report](http://theconversation.com/comments/184106/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184050)

And that still doesn't explain why Warlpiri kids perform so badly in Mathematics, despite this alleged spatial superiority.

4 months ago [report](http://theconversation.com/comments/184108/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jon Hunt**](http://theconversation.com/profiles/jon-hunt-9131)

Medical Practitioner

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184108)

David, you are trying to allude to something. What is it?

4 months ago [report](http://theconversation.com/comments/184128/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184106)

I've been asked that question before.   
I believe at least a partial answer lies in the ability of children to learn language by immersion.   
I'm glad you picked Argentina.It so happens I did my primary education there. I learned Spanish by immersion (Dutch is my mother tongue), I can't remember the process, it just happened, I am not consciuos of ever not being able to speak listen write and read Spanish. Exposure to English was minimal (it took me years to realize that "Jesus Jolly goo felo" wasn…

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When we arrived in Australia I was the only Dutch kid in the class, the cultural semi urban (Victorian country town) environment wasn't all that dissimilar to Palomár or Loosdrecht. I already knew how to read and write and do arithmetic, these skills were easily transferable, and English was easily picked up by immersion by a young brain. There are countless migrants that arrived here at a young age that went through such an experience and now speak a perfect 'native speaker' Australian English and would have sailed through Naplan, which lucky for many would not yet have existed.   
One of the points Christine makes in her article is that Warlpiri children think differently. Warlpiri kids are not immersed in English at an early age, not even in school where often the only fluent English speaker is the white teacher (I use 'white' as a convenient label. In multi cultural Australia increasingly teachers of varied 'non-white' backgrounds are teaching in remote schools). The school environment is alien (dare I suggest more alien than urban Australian classrooms are to new arrivals from Singapore or Amsterdam). Naplan testing of Warlpiri Children is not just meaningless, it is cruel. They go home having been virtually told they are stupid.   
Regarding your subsequent post, I hope this diatribe (and don't get me wrong I fully realize this isn;t about me, I only use my own experiences by way of example) goes some way to explain why Warlpiri kids "perform so badly in Mathematics". Perhaps they are being asked the wrong questions?

4 months ago [report](http://theconversation.com/comments/184165/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184024)

Hello again David! I think that both Jon and Frank have already answered this as well as I can, so all I'll add is that it is possible to construct a test on culturally-specific knowledge that anyone could fail.

So if we tested non-Indigenous kids of 5 or 10 on their ability to apply their knowledge of the cardinal directions in a rapid fire manner, then their results on such tests would be far inferior to Warlpiri kids in Lajamanu, Yuendumu, etc, and other Aboriginal kids elsewhere in northern Australia - in which case you'd have to admit that the non-Indigenous kids have done 'atrociously' in relation to Warlpiri kids!!!

4 months ago [report](http://theconversation.com/comments/184233/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184165)

Frank, in other words, performance on Year 3 NAPLAN Maths assessments is not dependent on English fluency. So if this Warlpiri (and other Indigenous) culture and language is so mathematical, why do they perform so spectacularly badly compared to immigrants from newly arrived NESB kids in Victorian schools?

4 months ago [report](http://theconversation.com/comments/184235/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

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In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184165)

That's right Frank - and to explain further, David, the NAPLAN maths tests are number-centric, and that is supported by the broader cultural practices of the dominant culture, whereas in the latter case, spatial concepts receive relatively (and considerably) less airing in the curriculum...& also in the testing program!

4 months ago [report](http://theconversation.com/comments/184237/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184233)

Christine, I’m not aware of anybody who thinks any knowledge is “innate”. I certainly don't.   
“So if we tested non-Indigenous kids of 5 or 10 on their ability to apply their knowledge of the cardinal directions in a rapid fire manner...you'd have to admit that the non-Indigenous kids have done 'atrociously' in relation to Warlpiri kids!!!”   
Without a question. But not atrociously in ‘Mathematics’ or even ‘spatial thinking’.

4 months ago [report](http://theconversation.com/comments/184302/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184233)

The example you gave of the Lajamanu “IQ test” that asked questions about correct cutlery arrangement is certainly an example of very poor/backward understanding of assessment by whichever bureaucracy made you test the kids that way. How long ago was it? It sounds like something before WWII. I’m not an expert in that area, but I was under the impression that mandatory IQ testing of Australian school kids ended many decades ago? I am aware of a few IQ tests used in kids today, and they have been developed over the past few decades with a very high cultural sensitivity. The two that immediately spring to mind, which according to your points, would suit Aborigines very well are the Cattell Culture Fair Test and the Ravens Progressive Matrices. Both are completely non-verbal AND non-numerical, focusing only on patterns and spatial relationships.   
<http://en.wikipedia.org/wiki/Cattell_Culture_Fair_III>   
<http://en.wikipedia.org/wiki/Raven%27s_Progressive_Matrices>

4 months ago [report](http://theconversation.com/comments/184303/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184303)

Well first, I can assure you that I wasn't even around prior to WW11, David!

At this point I think I need to know your definition of 'mathematics' - does it include space + time, or just number?

Dr Google isn't necessarily the sine qua non in terms of setting the parameters here...

So, over to you -

4 months ago [report](http://theconversation.com/comments/184309/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184309)

Christine that is a very good question, which I have no doubt minds far finer than mine have debated for yonks. But I can say is that (i) While Mathematics is based on Arithmetic, Maths most definitely is not "just number". (ii) And not only do I agree that space is part of Mathematics, I also argue, space might be the most significant. (ii) Time is also part of Mathematics.

4 months ago [report](http://theconversation.com/comments/184335/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184335)

So, now I really do not understand your position - why are you excluding Indigenous space/time concepts from 'maths' - to which category they certainly belong - if, as you say, maths is more than 'merely' number?

These concepts are no more innate - or - folkloric than those of the dominant culture.

Let's just consider TIME for instance - Indigenous concepts of time are in part (but by no means entirely) linked to events, whereas there's a misconception that 'time' is not linked to events but…

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These concepts are no more innate - or - folkloric than those of the dominant culture.

Let's just consider TIME for instance - Indigenous concepts of time are in part (but by no means entirely) linked to events, whereas there's a misconception that 'time' is not linked to events but is far more decontextualised than that may suggest.

But, IF that is the truly case, one has to admit that the dominant culture's notions of times are equally connected to events, the historical veracity of which not everyone accepts and many today believe to be mythological in nature (and I stress that in saying this, I certainly do not intend any disrespect to anyone's beliefs, no matter what side of the colonial divide on which they are placed/or they place themselves.

But, we have BC = Before Christ; AD = Anno Domeni - etc...these are among our dominant culture's fundamental measuring sticks for the passage of time...

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[**Jon Hunt**](http://theconversation.com/profiles/jon-hunt-9131)

Medical Practitioner

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184351)

A bit of an aside, but I asked an Aborginal person today when they were planning on travelling back home. Their response was "when the road dries". I suggested that they could perhaps be more precise, but that was as accurate as I could get. It was important to me for logistical reasons that I have a more accurate answer, but they seemed disinterested in even estimating when this would be.

4 months ago [report](http://theconversation.com/comments/184360/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184165)

Frank, given the current clearly unsatisfactory approach to teaching language to Warlpiri children, I personally would strongly support any movement to have the kids taught their Mathematics in their own language. The kids could still sit the exact same NAPLAN test as everybody else, except the written instructions would Warlpiri, not English. This sort of arrangement works perfectly fine in international testing. For example, Australian, Chinese, Finnish, and Japanese children all take exactly the same Maths PISA test, except in their own language.

4 months ago [report](http://theconversation.com/comments/184383/abuses/new)

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[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

A remarkable example of an author arguing against her own proposition. At the outset Christine assures us that there is no inherent difference, since to do so invites the charge of racism. She then goes on to produce evidence of an aptitude that endows the young athletes with special skills and an ability to excel at the game by greater application and effort.to gain their disproportionate impact on the game. Why is it so vital to deny that they have a natural talent, which, when nurtured, can enable them to participate at the highest level?

4 months ago [report](http://theconversation.com/comments/183244/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183244)

Dear John,

Thank you for your response (from sophistry.com?)

The flaw in this argument is that I'm not talking about purely 'natural' aptitude, either with respect to the cultural learning of non-Indigenous kids or tradition-oriented Indigenous kids, but what is INCULCATED, ENCOURAGED, & VALUED culturally in each case.

We need to separate culturally-socialised knowledge (ie passed down by cognitive processes) from genetically-endowed gifts - and while all seeming 'gifts' are a product of both, the former is always needed to bring the latter into a form of public success.

...many a rose is born to bloom unseen...

4 months ago [report](http://theconversation.com/comments/183296/abuses/new)

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[**Marcus James Dilena**](http://theconversation.com/profiles/marcus-james-dilena-98232)

Retired

Fascinating stuff. I am not an expert on education, spatial orientation, or especially AFL football (I barrack for the Crows). But I have lived and worked with Warlpiri people in Lajamanu and Yuendumu. As I have worked with other Indigenous people in the Northern territory and in PNG. Once again it is unfortunately observable that some comments, sincere that they may be, come from Western assumptions that all technology and learning emminates from the so called developed countries. It is an unfortunate…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Fascinating stuff. I am not an expert on education, spatial orientation, or especially AFL football (I barrack for the Crows). But I have lived and worked with Warlpiri people in Lajamanu and Yuendumu. As I have worked with other Indigenous people in the Northern territory and in PNG. Once again it is unfortunately observable that some comments, sincere that they may be, come from Western assumptions that all technology and learning emminates from the so called developed countries. It is an unfortunate, and ill founded, view that peoples who have English as a second, third or fourth language should equate with those who have used it from birth. I wonder how many Australians are bi- or tri- lingual by the time they are 6 years old. It is indeed a mistake to assume a position of superior knowledge, as most who appreciate the complexities of the many, many Indigenous communities will attest.   
Indigenous peoples have just as much to teach us , as do we them. It would be interesting if governments and the public were to more fully appreciate and understand how these people have survived for as long as our so called western democratic civilization.

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Marcus James Dilena](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183287)

Hello Marc,

Totally agree with your post - very focused.

I have just been watching the excellent Australian Story tribute to Mr Yunupingu, and although it is terrific, I couldn't get my head around the fact that not one of the non-Indigenous persons interviewed (all very decent people) could not pronounce the name of his band or even his family name correctly...we need to get past this deep monolingualism and deep monoculturalism... and soon.

And as you say, the fact that dominant cultural coordinates prevail is part of this problem...looking forward to more posts from you, Marc...

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[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

Christine, my initial comment was based on the AFL reference. I have reread your post in greater detail. It is not at all remarkable that desert dwelling people have an innate sense of direction nurtured from birth, since it has been central to their survival. Other ethnic groups in similar circumstances exhibit the same skill, eg, Innuit, Taureg peoples. A more striking example comes from seafaring cultures, think Kontiki. Peoples without this need have lost the skill by evolution. It still…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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If I could comment on the other matters beyond my field of expertise; my view is that Australia is facing an educational crisis that precludes us from indulging our children with cultural instruction within the formal school system. Our survival needs now depend on our ability to participate in the global economy, and formal education must prepare our kids to compete in what may become a hostile environment. This is best done by total immersion, as in programs being introduced. Communication is central to the challenge, with mathematics the universal language. Teaching Indigenous languages is a distraction we can't afford. By all means promote cultural awareness as an extra curricular option. The reference to reconciliation is redundant. We are reconciled and now simply need to move forward as an integrated and cohesive Nation. Persisting with separatist goals will end in tears.

4 months ago [report](http://theconversation.com/comments/183360/abuses/new)

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Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183360)

Good afternoon John.

I agree that there are other groups in the world whose finely-honed mathematical abilities aren't based wholly on number, but on spatial relationships. The evidence is there.

But there is nothing separatist about engaging with different ways of thinking - this is about coming closer together, not growing further apart.

Regarding the teaching of Aboriginal languages, this is highly practical when it comes to the teaching of Aboriginal children who do not speak English…

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But there is nothing separatist about engaging with different ways of thinking - this is about coming closer together, not growing further apart.

Regarding the teaching of Aboriginal languages, this is highly practical when it comes to the teaching of Aboriginal children who do not speak English - it isn't a "distraction" and it isn't a luxury that we can not afford.

It is something that we cannot afford not to do, in the case of Aboriginal kids who begin school not speaking English.

As Jane Simpson, Patrick McConvell and Jo Caffery have written at the beginning of their article," Gaps in Australia’s Indigenous Language Policy: Dismantling bilingual education in the Northern Territory" (available online - will send you the reference): "Young children learn best when taught through their mother tongue. This commonsense principle has been supported by decades of research on bilingual education for children who don't speak the dominant language. The research has also shown that there are positive effects on children’s cognitive development if they are encouraged to become strong bilinguals. For Indigenous communities, bilingual education has been highly valued not only because it helps children maintain Indigenous languages, but also because it provides an honoured place for Indigenous languages in the curriculum and an honoured place for Indigenous teachers."

Mastery of a person's first language facilitates the learning of a second language - in this case, English.

Multilingualism is the global norm - Australia's deep monolingualism is aberrant, by comparison with most of the rest of the world.

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[**Jon Hunt**](http://theconversation.com/profiles/jon-hunt-9131)

Medical Practitioner

I have for some time known that Aboriginal people apparently do not have words to describe numbers more than a few, making me think they have a different way of viewing the world. This may be a little off the point, but I have a friend who is Singaporean and when he is home in Singapore he can emerge from a underground walkway and know exactly where he is, whereas I am completely lost. However, when we go bushwalking I seem to know easily where North is yet he is mostly completely lost.

4 months ago [report](http://theconversation.com/comments/183583/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Jon Hunt](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183583)

Jon, all Mathematics is based on Arithmetic. Somehow, I'd be suspicious of any claim about the mathematical ability of a people whose command Arithmetic stops at the number two. ;)

4 months ago [report](http://theconversation.com/comments/183610/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Jon Hunt](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183583)

Dear Jon (and David),

Thanks very much for your posts.

The general Australian public’s lack of knowledge about Indigenous Australian mathematical systems and practices, and the absence of recognition of those systems and practices even when they are known, has sometimes given rise to ignorant and (or even in some cases, frankly racist remarks) about Indigenous mathematics. The dominant discourse suggests that there is NO Indigenous maths based on number or on any form of maths for that matter…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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The general Australian public’s lack of knowledge about Indigenous Australian mathematical systems and practices, and the absence of recognition of those systems and practices even when they are known, has sometimes given rise to ignorant and (or even in some cases, frankly racist remarks) about Indigenous mathematics. The dominant discourse suggests that there is NO Indigenous maths based on number or on any form of maths for that matter, or that Aboriginal maths is inconsequential...

Unfortunately, even some highly regarded linguists of Australian languages have at times promulgated such myths, for example: “No Australian Aboriginal language has a word for a number higher than four.”   
(Blake, Barry, 1981, Australian Aboriginal Languages, Angus and Robertson, Sydney, pp 3-4). This isn't accurate.

It's not actually true that Indigenous mathematics (number strand) ends at 2 or 3. It's in fact one of those urban myths that keeps on being perpetuated.

To begin, Indigenous numerical systems are not Base 10, which means that it has perhaps been easy to take on board a view that Indigenous innumeracy was the norm. And as I've explained in the article, in terms of Indigenous maths, spatial relationships are considerably more important than vice versa (and it's the other way around in our culture - not surprising when ours is a capitalist society!

Number is not therefore the emphasis in 'traditional' Indigenous mathematical systems. It also needs to be stressed that in tradition-oriented Indigenous Australian societies, while number does play a role, albeit less so than in the dominant culture of this country, traditional Aboriginal number-based (or computational) mathematical systems do not deploy a (decimal) system, as do the dominant Australian mathematical cultures.Some Indigenous Australian groups use quinary-based systems; there is substantial evidence of other numerical systems, elsewhere in Aboriginal Australia, including Base 27.  
  
 (For an introductory article on this, see, for example, Harris, John, 1987, Australian Aboriginal and Islander Mathematics, in Australian Aboriginal Studies (AIATSIS) Journal, Number 2, 1987, Canberra, pp 29-37).

Over to you!

4 months ago [report](http://theconversation.com/comments/183691/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183610)

Hello David,

'Arithmetic' is only one strand of mathematics and mathematical thinking!

Please read the above article...

4 months ago [report](http://theconversation.com/comments/183693/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jon Hunt**](http://theconversation.com/profiles/jon-hunt-9131)

Medical Practitioner

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183691)

Hi Christine, well I am pretty naive and it would not surprise me if I was incorrect. I have had a bit to do with Aboriginal people but not really felt comfortable enough to interrogate them about their mathematics. Forgive my ignorance, but how are spacial relationships considered mathematics? If so, it seems to be a specific form of mathematics (I am thinking of trigonometry as our equivalent). I have spent too much time a long time ago studying mathematics at an abstract tertiary level to think of things in a different way.

4 months ago [report](http://theconversation.com/comments/183762/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Jon Hunt](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183762)

Vector addition is yet another mathematical thought process. I've found that Warlpiri people are very good at it albeit on a subconcious level (dare I say "natural"!)   
I was involved in a geophysical survey once that involved straight parallel motor vehicle driven lines. I took readings at speedometer intervals. I made a pact with the Warlpiri driver- "I want you to go west, I don't care how much you weave to avoid mulga stumps, but you have to fix any punctures". This was many years before GPS…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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4 months ago [report](http://theconversation.com/comments/183810/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jon Hunt**](http://theconversation.com/profiles/jon-hunt-9131)

Medical Practitioner

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183691)

Christine, If I can be perhaps be critical I think this article presumes some knowledge of mathematics, navigation and Indigenous languages; I may be incorrect but isn't this meant to be a forum for laypeople? I have had to read the article a few times to get the gist of what you mean, but perhaps I am a little slow. I had to look up 'cardinal directions' although I was pretty sure I knew what these were I had to check...!

4 months ago [report](http://theconversation.com/comments/183864/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jon Hunt**](http://theconversation.com/profiles/jon-hunt-9131)

Medical Practitioner

In reply to [Jon Hunt](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183864)

I also had to look up what 'inclulcated' means!

4 months ago [report](http://theconversation.com/comments/183866/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jon Hunt**](http://theconversation.com/profiles/jon-hunt-9131)

Medical Practitioner

In reply to [Jon Hunt](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183866)

Which I seem to have spelled incorrectly..

4 months ago [report](http://theconversation.com/comments/183867/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183693)

Christine, Arithmetic is NOT merely "one strand of mathematics..." it is the foundation on which all mathematics is built. Where you are going wrong on this whole subject is that "indigenous mathematics is "a learned skill essentially deictic in nature, that most children in our dominant culture Australia are still struggling with at 15 or 16 years of age."   
The way you have reported Warlpiri (and alleged Indigenous groups in general) language and mathematics shows the exact opposite of deixis. In fact, their language and spatial understandings are very limited, trapped in a prism of cardinal directionality. What you call the "dominate culture" is linguistically and mathematically rich in BOTH cardinal and relative directionality. Unless the Warlpiri are educated like the rest of us they will never be able to grasp mathematics.

4 months ago [report](http://theconversation.com/comments/184114/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183691)

"To begin, Indigenous numerical systems are not Base 10, which means that it has perhaps been easy to take on board a view that Indigenous innumeracy was the norm. And as I've explained in the article, in terms of Indigenous maths, spatial relationships are considerably more important than vice versa."   
Except in "dominant Australian mathematical cultures", spatial thinking is overwhelmingly not "decimal", but sexagesimal. That spatial thinking is known as "geometry", "trigonometry", and "astronomy".

4 months ago [report](http://theconversation.com/comments/184135/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184114)

Yes, we do have a relatively rich cardinal directional vocab. and terminology in the dominant culture - no one can deny that. But how many kids (or even adults) in our dominant culture can actually APPLY that knowledge in an almost effortless manner, with apparently little or no thought, ie to the point of its being an almost-automatic response?

I do not know many.

But in terms of number, as a result of having had addition, subtraction and multiplication and division tables drummed into us…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Yes, we do have a relatively rich cardinal directional vocab. and terminology in the dominant culture - no one can deny that. But how many kids (or even adults) in our dominant culture can actually APPLY that knowledge in an almost effortless manner, with apparently little or no thought, ie to the point of its being an almost-automatic response?

I do not know many.

But in terms of number, as a result of having had addition, subtraction and multiplication and division tables drummed into us at primary school (this was particularly the case with my generation), we are able to succeed in numerical operations almost without blinking.

One example: the other day in the supermarket I picked up a major addition error in the flash of an eye, which the (much younger) person hadn't noticed - and when he double checked on a calculator he was astounded that I had reached the correct figure in my head in virtually no time whatsoever.

The point that I'm making is that this is not the result of some 'miraculous' ability on my part - far from it - but the result of years of acculturation that had occurred at school, and was also reinforced in the home. 'Cleverness' with number was a culturally valued skill - but the point is, like excellent spatial apprehension, it is a LEARNED skill...so why not value both? Both have their important applications in the so-called 'real' world and in mathematics...

4 months ago [report](http://theconversation.com/comments/184249/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Jon Hunt](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183864)

Jon - you are right in that the article traverses a number of areas of knowledge that are perhaps not mainstream, but I do think that you and others have grasped its major thrust...and of course, it is in a sense your experience in coming to terms with it is more or less the reverse process that many Indigenous language speakers have to go through on a daily basis, i.e. grappling with what is for them an essentially foreign language, English, and the equally foreign concepts that accompany that language, including that pertaining to maths/numeracy in the dominant culture...the only really difference is that they have no choice but to do so...

4 months ago [report](http://theconversation.com/comments/185378/abuses/new)

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[**Mal Jones**](http://theconversation.com/profiles/mal-jones-102186)

Turf Manager

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184249)

There's got to be something more than this.. My sister picked up Maths and I have not in all my years.. My Mother many years before me did not pick up maths. My father did.

We were all exposed to the same sorts of drills as you I'd imagine..

So there is likely some "nature" component to some skills and not only nurture..

If you want to teach my sister to sing it's gonna take a lot of effort, encouragement and correcting.. if you wanna teach me to sing it's gonna be a bit of a breeze really…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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If you want to teach my sister to sing it's gonna take a lot of effort, encouragement and correcting.. if you wanna teach me to sing it's gonna be a bit of a breeze really.

Our different strengths were noticeable from a very young age..

Since some people of different origins do have very different body types and things there may also be an advantage in some sports. It's medical knowledge.. I think Pacific Islanders can have a slightly higher Body Mass Index than other people and still be considered healthy.. Some people who are really really thin have that in common with a lot of other people who are from the same place. With some exceptions.. Asians tend to have less pubic hair apparently.. I think people from India can have a lower BMI than most others and still be considered healthy too..

But the thing that bugs me most in sport is people who are the equivalent of "tone deaf" at physical activity but through coaching have learnt some skills and they play for their country. Cricket is a prime example.

Isn't it very true some of us are a lot more "doing things" sorts of people than others.. I learnt about visual, auditory and kinesthetic people. Is that only a nutured thing?? I wouldn't think so.

If movement isn't your thing by all means stay active but please don't aim to go to the top and be on TV.. I'd rather watch people who move well.. much more entertaining..

Cricketers who come from privelleged families can afford all sorts of coaching and camps and connections with famous people..

But they won't fill a stadium so much as those who are amazing to watch..

Yes you can improve your skills at most things to a point.. but it's just not the same as some one with a natural gift.

For me to improve my sporting abilities I need a wee bit of help but i can watch others and improve on my own.. I don't need to be corrected and coached every step of the way as much as some do.

Some coaches whether vocal or sporting or other get the most pleasure out of helping people who thought there was no hope for them.. just because those people are probably slightly more grateful than someone who knows they are good and doesn't need much of a hand doesn't make it the best choice to help them.

It makes good economic sense to put your energy into those who are made for something and want it..

Having said all this it is good to see people with physical/ mental disabilities and such achieve their dreams.. I am talking more about ordinary people hogging the lime light.. I don't think stories about tone deaf people singing are quite as inspiring as the hurdles other people have had to overcome..

2 months ago [report](http://theconversation.com/comments/208153/abuses/new)

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[**Mal Jones**](http://theconversation.com/profiles/mal-jones-102186)

Turf Manager

In reply to [Mal Jones](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_208153)

Very good article though.

I would like to learn some indigenous maths.. May be I can do well at it. The passing things backwards rules in other sports makes no sense to me..

Maybe I would have done well at AFL

2 months ago [report](http://theconversation.com/comments/208156/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

Christine - I find it difficult to debate someone so passionate, and so capable of presenting a point of view cogently and politely. I should therefore save my input for another time and place. The problem is that your opinion is supported by your qualifications, and therefore likely to influence others who may be less critical in their reasoning. Many of your supporting arguments are well intended, but false (that is of course opinion). Eg, Australia is monolingual and monocultural. Nothing…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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4 months ago [report](http://theconversation.com/comments/183819/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183819)

Dear John,

Thank you for your interesting post, which is good for thinking with...I must go to work exceedingly early tomorrow, so let it suffice that I make one comment now, with more comments to follow soon.

It is a not unnecessarily emotional comment, because it is inflected by historical truth.

As Australian English first language speakers, as is the case with other first language-speakers of English (e.g. many, but definitely not all, English people and many but definitely not all people…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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It is a not unnecessarily emotional comment, because it is inflected by historical truth.

As Australian English first language speakers, as is the case with other first language-speakers of English (e.g. many, but definitely not all, English people and many but definitely not all people in the US - recent migrants etc excepted), particularly in recent years, have been in a situation that really differentiates us from most people on the world: that we do not have to make the effort to get to know other people through THEIR first languages, filtered through our own - ie through THEIR original instrument of expression.

Monolingualism can make people lazy.

That is my point.

This is not personal in any way, but should alert us to our unusual position in the world. The onus for learning other languages is the normative position; our position is highly unusual.

4 months ago [report](http://theconversation.com/comments/183857/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183857)

"Monolingualism can make people lazy."   
Indeed. That is why it is completely inappropriate for "dominant culture" academics to campaign to deny Indigenous peoples the mind-expanding and social participation advantages of the education the rest of us have access to.

4 months ago [report](http://theconversation.com/comments/184141/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184141)

Hi David,

I honestly don't know of ANY 'dominant culture' academics or anyne else for that matter, either Aboriginal or non-Aboriginal 'campaigning' against Indigenous people's access to a decent education, in the way that you describe.

Where is the evidence base to support this?

Who are these people campaigning to deny Aboriginal pepole such rights - who are they, exactly?

A stronger evidence base is needed here, please!

An evidence base woiuuld expands

4 months ago [report](http://theconversation.com/comments/184161/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Will Owen**](http://theconversation.com/profiles/will-owen-98351)

Librarian

Very early on in my encounters with Aboriginal people, I was in the small community of Amoonguna near Alice Springs. I was talking to an artist from whom we were purchasing some small canvas-board paintings and exchanging information about where we came from. Since it was near holiday times, I asked if he had plans to travel "back" to his country. As I said that, I unconsciously tilted my head "back." He immediately picked up on the gesture and corrected me by pointing in the direction in which his country lay. I was dumbfounded: I probably couldn't do that right here in the town I live in in North Carolina (USA).

4 months ago [report](http://theconversation.com/comments/183869/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Will Owen](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_183869)

The artist's seemingly effortless gesture towards his country masks the depth of the early and life-long learning experience underpinning that gesture.

Such spatial acuity is evident Central and Western Desert artists who did not grow up in houses during their formative years, thereby enabling a different kind of ‘eye’ or visual consciousness to emerge and develop. This is reflected in their remarkable artwork.

Thank you, Will, for this lovely story, elegant in its apparent simplicity - but which also reveals a good deal about the topic under discussion. More posts please!

4 months ago [report](http://theconversation.com/comments/184253/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

Astuteness in traditional cultures regarding spatial relationships also extends to astronomy.

Australian Aboriginal Astronomy: Overview

Ray P. Norris, Duane W. Hamacher

ABSTRACT: The traditional cultures of Aboriginal Australians include a significant astronomical component, perpetuated through oral tradition, ceremony, and art. This astronomical component includes a deep understanding of the motion of objects in the sky, and this knowledge was used for practical purposes such as constructing calendars. There is also evidence that traditional Aboriginal Australians made careful records and measurements of cyclical phenomena, paid careful attention to unexpected phenomena such as eclipses and meteorite impacts, and could determine the cardinal points to an accuracy of a few degrees.

<http://arxiv.org/pdf/1306.0971v1>

4 months ago [report](http://theconversation.com/comments/184179/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Gail Carnes](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184179)

Thank you very much for this informative and relevant post, Gail, especially for the link to the article, which I hope that others will read, too. I'd also like to draw your attention and that of others reading this post, to the article about Torres Strait Islander astronomy that's also streaming live right now on The Conversation, and has been written by Duane Hamacher, one of the co-authors of the article you've drawn our attention to here...   
It's a terrific article in a number of ways. One particular aspect of this that interests me is the level of 'embeddedness' of Indigenous science in narrative, and the Torres Strait Islander narrative related to astronomical knowledge presented in the latter article is particularly telling...

4 months ago [report](http://theconversation.com/comments/184492/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Ian Davidson**](http://theconversation.com/profiles/ian-davidson-98492)

Retired

Christine, your article demonstrates vividly that Indigenous people have a spatial awareness far superior to that of the non-Indigenous population, but you seem to regard it as self-evident that this awareness can be classed as mathematics.

The spatial awareness you describe must involve a sort of internal calculus but that does not amount to mathematics as it is commonly understood; moreover, I suspect it cannot be imparted to others. Can you envisage an Indigenous footballer enhancing the playing…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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The spatial awareness you describe must involve a sort of internal calculus but that does not amount to mathematics as it is commonly understood; moreover, I suspect it cannot be imparted to others. Can you envisage an Indigenous footballer enhancing the playing abilitiy of his white team mates by explaining how he calculates where he needs to be to mark a ball moments after it has left the boot of another player? The phenomenon seems to me to be analogous to the thought processes of someone who can arrive at the correct answer to a complicated mathematical problem 'by feel': it can be done, without a doubt, but not explained to anyone else.

This is not to play down the significance of Indigenious people's spacial ability, which is also demonstrated by their performance in IQ tests measuring ability to recall the location of different objects randomly placed in relation to one another. I am just asking what is gained by calling it mathematics.

I realise that you are looking forward to the day when Australia's white society draws some of its identity from Indigenous culture -- as has happened in New Zealand. I look forward to that day too and believe we have already started on that course. As regards Indigenous people's superiority in spatial awareness, the non-Indigenous community would be making a valuable step forward simply to acknowledge it -- as it is a clear instance of the notion that intellectual ability manifests differently according to culture -- but I am dubious about what can be achieved by calling it 'mathematics' and advocating its inclusion in the national mathematics curriculum.

4 months ago [report](http://theconversation.com/comments/184457/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Ian Davidson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184457)

Ian - to respond to each of the entirely valid points you make in this response, one by one: In terms of whether what I'm describing/evoking/discussing in this article is, or is not, 'mathematics', perhaps this is to some extent a matter of nomenclature. It is however generally accepted by teachers today that spatial reasoning, spatial ability, and the ability to visualise these and internalise them within one's broader cognitive/conceptual framework, do, broadly speaking, constitute mathematical…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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As Marilyn Nickson (former Head of the Primary Assessment Unit of the University of Cambridge Local Examination Syndicate, UK.) has written in a relatively recent book (2000; 2004; republished and revised 2008), 'Teaching and Learning Mathematics: A Teacher's Guide to Recent Research and Its Application':

"Whatever the terminology used, it is generally accepted that there is a relationship between cognitive variables of a spatial nature and learning related to geometrical concepts, and there are clear indications that nurturing spatial abilities in children is important to this aspect of their learning. What is less clear is the relationship between this ability and other areas of mathematical learning...(pages 48-49).

I'd also refer you to Frank Baarda's comments about vectors, in relation to the first sentence of the above quotation.

One of the points that I'd like to make is that at present Aboriginal children who speak an Aboriginal language and are living mostly in 'remote' locations are NOT having their culturally-specific and extraordinary spatial ability nurtured, while there's a lot of nurturing (which is 100% fine and as it should be) going on in this country of mainstream children's ability with number, from early childhood onwards. It would be great to see such knowledge actually \*\*\*recognised\*\*\*in an unambiguous way in the mainstream maths curriculum. This does not mean actually trying to impart or teach it to others, but simply some discussion about it in the curriculum. I am not advocating wholesale teaching of this to others; but at present I would argue that the vast majority of Australians doesn't even have an awareness of its existence. Rather, in the mainstream, most Australian people's view about Indigenous maths is overwhelmingly one of deficit, which should not be the case. The hegemonic view is that 'our maths' is better than 'their' maths - or even a refusal to accept that mathematics exists in Indigenous societies. So, a level of inclusiveness of these ideas in the mainstream curriculum would have the dual effect of recognition and respect for this alternative form of maths...

I also believe that the curriculum should be flexible enough to give Indigenous kids to demonstrate this strength via testing programmes, including NAPLAN...where they would clearly do better than other Australian kids, particularly, to take up Frank and David's points, if they could take the tests in their own Australian languages (the latter being the linguistically correct way of referring to Australia's Aboriginal languages).

Neither would I suggest AFL players trying 'to learn' this ability in adulthood - although there are lessons to be learned there, too. It is clear that children cannot develop these excellent abilities if they are cooped up inside playing video games for 99% of their childhood. One needs to engage regularly with large areas of relatively open space to develop these abilities, even intuitively, which I'm sure many footballers of any background have done in order to reach the elite level.

Before this goes response on for too long, I'd just like to finish by saying that I believe that there's a lot to be gained by calling this spatial ability 'maths' - 1. it demonstrates that it is a actually a learned cognitive ability - not simply some form of heaven-sent natural 'gift' or aptitude; 2. recognition of same by other Australians; and 3. the respect that comes with such recognition.

Over to you!

4 months ago [report](http://theconversation.com/comments/184547/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Zac Hughes-Miller**](http://theconversation.com/profiles/zac-hughes-miller-98511)

Student

I can definitely attest to the 360 degree effect of AFL, I grew up playing Rugby, where your opposition is required to be on the other side of the ball, and hence your spatial awareness is concentrated on 180 degrees (maybe a little bit more so you know where the guy you will pass the ball is). Anyway, i started playing AFL when i was around 14, and you quickly realise how differently your awareness needs to be after you've been chased down a few times.

The rules of AFL also heighten the need…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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The rules of AFL also heighten the need for spatial awareness, the holding the ball rule (if you are tackled with the ball and had 'prior opportunity' to dispose of it the opposition receives a free kick, this makes it crucial that you are never 'caught out' by a defender that you can't see.

It would be interesting to see if ppl who don't refer to their limbs in relation to themselves but rather in relation to the broader environment they find themselves in have a higher rate of ambidexterity, theoretically it makes sense though probably experimentally difficult to test.

4 months ago [report](http://theconversation.com/comments/184574/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Zac Hughes-Miller](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184574)

A great piece of commentary Zac, and it's also good to hear from someone who has actually played the game - which is something that no one else has 'admitted to' (although that doesn't rule it out of course).

I've 'recommended' this comment to others, to draw their attention to it...

4 months ago [report](http://theconversation.com/comments/184581/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Donovan Baarda**](http://theconversation.com/profiles/donovan-baarda-98512)

Software Engineer

I grew up at Yuendumu and learned Warlpiri as my second language. I also consider myself to be pretty good at maths. I'm always frustrated by comment threads like this and weary of trying to post anything. It's like trying to explain Laplace transforms to to someone who didn't go past basic maths. There is so much foundation knowledge missing I don't know where to begin. So I'll just throw in a few random comments;

Warlpiri as a language is very rich on directional/spatial stuff, and weaker in…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Warlpiri as a language is very rich on directional/spatial stuff, and weaker in time stuff. There are no words for left or right, so directions always use cardinal points. This does change the way you think a bit, so you think of things relative to external references rather than relative to yourself. It also has singular, dual, and plural forms. This makes it probably better than English for explaining some maths stuff (geometry?), but maybe worse for some others (sequences?).

For numbers beyond three, traditional Warlpiri used the equivalent of a base-3 number system, though its now adopted a base-10 number system (which mostly came from playing cards). It also has inclusive vs exclusive forms of "us" (dual and plural forms), so it's much better at being explicit about including who you are talking to or not.

I played basketball both at Yuendumu and in Victoria. The rapid cardinal point calls in Warlpiri are a bit more efficient and less prone to error than the English calls. Also Warlipiri's community oriented culture and kin-system seemed to make it much quicker for teams to mesh, with less show-boating and ball-hogging. Games at Yuendumu were always more fun.

The spatial awareness thinking does remind me of descriptions of how dyslexics think (see "The Gift Of Dyslexia" by Ron Davis). Interestingly, dyslexia is also associated with excellence in sport and advanced mathematical skills. However, it does have it's drawbacks for literacy, and dyslexics usually suffer in all subjects under a normal western education.

I'm against changing the maths curriculum to tailor it for Aboriginals for the same reason I'm against making it more "verbal" for girls. Maths is it's own language, and it's the numbers that matter. The important thing is that you can calculate the right number, not talk about it. However, you are never going to learn maths if the person trying to teach it doesn't speak your language.

The primary school I went to had many Aboriginal teachers, and now has only "white" teachers with some Aboriginal "assistants". The usual argument for this revolves around qualifications. The formal qualification bar for teaching is now so high that no-one who speaks the same language as the kids is allowed to teach. This pretty much guarantees no Aboriginal from those communities will ever be qualified enough to teach.

For those who say "English is the universal language, we should teach them in English" I can only groan. Sure... you try and teach them in English and see how you go. Or maybe you can save yourself some time and look up all the studies that show how successful that is compared to teaching people (at least initially) in their native language. Maybe also take a trip overseas to Europe or Asia and find out how "universal" English is and how much of a requirement it is for getting an education and having a successful society.

There is no point trying to "prepare people for the workforce" if there is no work. Aboriginal communities in the NT have systematically had all local jobs taken away from them and given to external contractors. Even locally elected councils have been replaced by centralized shires in Alice-Springs. The few local businesses that do hire locals are being starved to bankruptcy by income-management, which forces half the communities welfare income to be spent elsewhere.

The biggest problem in Aboriginal communities is poverty, and nearly every other problem (alcohol abuse, poor education, domestic violence, etc) that people talk about has parallels in every other poverty stricken community (white-trash etc). The cultural differences are not the problem, they are interesting good bits.

4 months ago [report](http://theconversation.com/comments/184641/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Donovan Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184641)

Brilliant posting, Donovan...and I hope that political parties & independents of all persuasions will read this, and register your comments.

It would be useful for you expand/expound on the Warlpiri Base 3 numerical system; this would be instructive to many...

Ngulajuku...

4 months ago [report](http://theconversation.com/comments/184759/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christina Davidson**](http://theconversation.com/profiles/christina-davidson-52582)

CEO at [ANKAAA - The Association of Northern Kimberley and Arnhem Aboriginal Artists](http://theconversation.com/companies/ankaaa-the-association-of-northern-kimberley-and-arnhem-aboriginal-artists-818)

In reply to [Donovan Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184641)

Thank you, I really enjoyed reading your comments. And can't agree more about your final remarks about poverty - and the levelling it imposes.

2 months ago [report](http://theconversation.com/comments/207340/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Zac Hughes-Miller**](http://theconversation.com/profiles/zac-hughes-miller-98511)

Student

I recall hearing about how growing up in an urban environment exposes people to so many right angles that they find the trigonometry side of mathematics significantly easier to learn than their non-urban counterparts, in this area of mathematics understanding of right angles, parallel lines, and other relationships between straight lines is integral.

A quick google scholar search failed to find it, though there is wealth of research on the cultural differences in spatial frames of reference and…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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A quick google scholar search failed to find it, though there is wealth of research on the cultural differences in spatial frames of reference and the impact that language has on them.

The absolute/relative or environmental/egocentric differences in frame of reference could definitely affect how someone performs a task that is so demanding of your spatial awareness.

Sports that play on rectangular fields and have offside lines (rugby, gridiron etc.) are inherently geometrical and often in an egocentric/relative way, decisions with the ball in hand need to be made relative to where the player is.

For example in rugby you can only pass backwards, so you must be in front of the person you are passing to, you can kick forward but not to someone who was in front of you at the moment you kicked it. Also every player on the field moves up and down the field together with the ball, lastly unlike AFL it's a collision sport where being tackled is not necessarily a bad thing, so you get a lot more of two people running in to each other deliberately rather than one chasing another, so the decisions made by rugby players rely more on straight lines relative to you, so your relative spatial skills are called upon often.

Conversely AFL has no offside line, instead of an offside line they have the holding the ball rule, so being tackled is to be avoided at all costs, avoiding a tackle relies on a player being able to 'find space' on the field to run to, or an unmanned player to pass the ball to, if you are attempting to tackle someone, running in a straight line at them rarely yields results, instead you must almost herd them in to an inescapable position, additionally you can handpass or kick the ball to anyone in any direction, and you can also be tackled or bumped from any direction (you can also be bumped if you dont have the ball), also a lot of the positions are loosely fixed (backs stay back, forwards stay forward). These traits of AFL require more of an absolute frame of reference than a relative/egocentric one.

4 months ago [report](http://theconversation.com/comments/184658/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Zac Hughes-Miller](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184658)

Zac, the science is in, and the Warlpiri are absolutely abysmal at Mathematics. But then again, so are just about all public school teachers.

4 months ago [report](http://theconversation.com/comments/184676/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Duane Hamacher**](http://theconversation.com/profiles/duane-hamacher-98016)

Lecturer in Indigenous Astronomy at [University of New South Wales](http://theconversation.com/institutions/university-of-new-south-wales)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184676)

David, if you are really interested in learning more about the subject, I recommend you read the vast literature on the history and philosophy of science and mathematics. In particular, you should focus on the mathematical frameworks, systems, and number systems of Aboriginal people.

Read about the mathematics of Warlpiri kinship systems:

Gilsdorf, T.E. (2012). "Introduction to Cultural Mathematics: With Case Studies in the Otomies and Incas." John Wiley & Sons, pp. 65-69.

Learn about how…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Gilsdorf, T.E. (2012). "Introduction to Cultural Mathematics: With Case Studies in the Otomies and Incas." John Wiley & Sons, pp. 65-69.

Learn about how Warlpiri marriage systems utilise Group Theory:

Szalapski, R.F. (2013). "Warlpiri Kinship Relations and the Dihedral Group." <https://www.callmedrrob.com/?page_id=1741>

Read about research in NSW that shows many linear stone arrangements are aligned to the cardinal points:

Hamacher, D.W. et al (2012). "Orientations of linear stone arrangements in New South Wales." Australian Archaeology, No. 75, pp. 46-54.

Read about number systems used by Aboriginal people:

Harris, J. (1987). "Australian Aboriginal and Islander mathematics." Australian Aboriginal Studies, No. 2, pp. 29-39.

Hunting, R. (1987). "Mathematics and Australian Aboriginal Culture." For the Learning of Mathematics, Vol. 7(2), pp. 5-10.

McRoberts, R. (1990). "Counting at Pularumpi." Aboriginal Child at School, Vol. 18(2), pp. 19-45.

Bowern, C. and Zentz, J. (2012). "Diversity in the Numeral Systems of Australian Languages." Anthropological Linguistics, Vol. 54(2), pp. 133-160.

I encourage you to read this material and try to understand the context of Aboriginal mathematics.

I was very happy to come across this article. Indigenous mathematics is an extremely interesting and important, albeit under researched, area. Well done, Christine.

What we need is a PhD student or two to work on this subject. Any takers?!

4 months ago [report](http://theconversation.com/comments/184728/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Duane Hamacher](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184728)

Duane, I have long been all over the history of Mathematics and Astronomy. In fact, one of my top handful of loved historical personages was the Persian mathematician and Astonomer Sharaf al-Dīn al-Ṭūsī, and his genius Tusi-couple. But I am also completely up to date on all recent results of Warlpirri at Mathematics. NOW, time for YOU to get up to date, coz as I said, 'the science is in'.

4 months ago [report](http://theconversation.com/comments/184731/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184676)

Hi David,

With the greatest respect, I do not think that you have really engaged with the entirely valid points made by Zac in his two postings.

Words like 'abysmal', 'atrocious' etc etc as a form of blanket dismissal of almost all public school teachers and the entire Warlpiri nation's mathematical ability simply doesn't wash in forums of this nature, where people (see for example, Duane in his posting) need to offer some research evidence to support their views...

So, on what specific research are you relying to support these views? Or purveying?

I'm hoping that you do have some research base to support the above views...because otherwise it's very difficult to engage with them seriously...

You seem like a decent person so the ball is now in your court right now!

4 months ago [report](http://theconversation.com/comments/184744/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184731)

What 'science' are you citing, specifically? Duane has provided a list of peer-reviewed research publications, so it't time for you to show the rest of us your research basis!

Best regards...

4 months ago [report](http://theconversation.com/comments/184745/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Duane Hamacher](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184728)

Hi Duane,

Thank you for your post and I totally agree, that not just one but many PhD students should take up this challenge. The astronomical knowledge that you have discussed in your excellent article (currently on The Conversation now) as well as Indigenous mathematical knowledge is not just locally endangered but globally endangered, and its incumbent on all Australians to do something about this before further attrition takes place...& the same applies to the globally threatened remaining Australian Aboriginal languages.

4 months ago [report](http://theconversation.com/comments/185458/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184745)

Christine, you are an Education academic, who has 20 years of actual experience teaching and running Warlpiri schools. Are you telling me you are not aware of the performance of these kids in mathematics and cognitive assessments, including visuospatial skills? If you genuinely have never come across such data in your entire career, I will get it for you. But if this is the case, what have you been doing these past 30 years in the Education field?

4 months ago [report](http://theconversation.com/comments/185508/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184676)

Hi David,

Do you have some links to research reports you can share?

3 months ago [report](http://theconversation.com/comments/185703/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Duane Hamacher](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184728)

Hi Duane,

Thanks for the links to so many interesting papers!

3 months ago [report](http://theconversation.com/comments/185704/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184744)

Hi Christine,

Good question, because my own google search turned up nothing. Would very much like some links to substantiating research in this area.

David?

3 months ago [report](http://theconversation.com/comments/185705/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

Christine, On further reflection, I am not sure the 360 AFL perspective is entirely supportable. The focus of all players is the opposing team's goalposts. They constantly move the ball in that direction, albeit being aware of their immediate surroundings. The only games that I recall passing back are soccer, basketball and waterpolo where an offensive move breaks down and the team relieves the pressure, prior to establishing a new offensive phase. May I congratulate you on your efforts to encourage others to work within the spirit and intent of TC?

4 months ago [report](http://theconversation.com/comments/184922/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184922)

Hello John,   
Thank you for your considered post. I agree that the goal of AFL (pun unintended) is to get the ball through the sticks at the other end of the field, which means that teams are attempting to send it that way by the most efficient route, which is as unidirectional as possible. Nonetheless, the POTENTIAL exists within the game to send it 'backwards' or in any direction (N, S, E, W, covering 360 degrees) in order to achieve that goal eventually. It is rarely a unlinear process, or anything like it, on account of the tackling that can happen. Indeed, some of the boldest moves take place in sending the ball 'backwards', or 'sideways' and upwards too of course, giving the game a balletic air at times. Before writing this piece I watched a lot of AFL games on tv (research!) and noted that everything that I've described here can and does happen.   
For a more informed view from a player of the game (which I've never been) please read Zac Hughes-Miller's earlier post.

4 months ago [report](http://theconversation.com/comments/184981/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Zac Hughes-Miller**](http://theconversation.com/profiles/zac-hughes-miller-98511)

Student

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_184922)

The 360 nature of the sport is more about sensing pressure from behind you than in what direction you can pass, players do pass backwards in AFL but they often turn around to do so (usually easier this way).

As i said in the previous post, the rules of the game make it integral to try and not be tackled with the ball, the defender has the opposite goal, and because players can be anywhere on the field you must be aware of a potential tackle from any direction. In other contact sports the 'tacklers…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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As i said in the previous post, the rules of the game make it integral to try and not be tackled with the ball, the defender has the opposite goal, and because players can be anywhere on the field you must be aware of a potential tackle from any direction. In other contact sports the 'tacklers' are usually infront of you (unless your running in for a score in which case they are chasing you).

Basketball and waterpolo uses so few players (5 bball, 6 + Goalkeeper wpolo) that updating the position of defenders in your spatial short term memory shouldn't be to taxing and most players will know roughly where the other players are at any given time, reducing the chance of being 'caught out' by a defender. Soccer has more players to monitor (10 + goalkeeper), but you don't have to take possession of the ball in soccer, you can pass it on with one touch (soccer isn't my strong point though). Compare that to AFL, when you have the ball there are 18 possible defenders trying to tackle you from any direction, and if you get tackled you give away free kick instantly, this is very demanding of your 360 degree spatial awareness, much more than any other sport that I've played

4 months ago [report](http://theconversation.com/comments/185094/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Zac Hughes-Miller](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185094)

Thanks for this very lucid explanation, Zac - from a player's perspective - invaluable.

Please read John & everyone!

4 months ago [report](http://theconversation.com/comments/185112/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Zac Hughes-Miller**](http://theconversation.com/profiles/zac-hughes-miller-98511)

Student

In reply to [Zac Hughes-Miller](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185094)

Didn't mean that first paragraph to sound snide btw, I was thinking about the 'no-look' handpass behind someone whilst they are facing forward (similar to a back-heeled pass in soccer)

4 months ago [report](http://theconversation.com/comments/185118/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Ian Davidson**](http://theconversation.com/profiles/ian-davidson-98492)

Retired

Thank you for your lengthy reply to my post yesterday, which I found a very useful addendum to your article, but I want to challenge you on another point. I was struck by how quickly your article dismisses as 'soft racism' the belief that Indigenous people's spatial awareness could be even partly innate.

My understanding, admittedly slight, of Noam Chomsky's work on children's language acquisition is that they are born 'programmed' to receive language and match it to the world. If one assumes…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thank you for your lengthy reply to my post yesterday, which I found a very useful addendum to your article, but I want to challenge you on another point. I was struck by how quickly your article dismisses as 'soft racism' the belief that Indigenous people's spatial awareness could be even partly innate.

My understanding, admittedly slight, of Noam Chomsky's work on children's language acquisition is that they are born 'programmed' to receive language and match it to the world. If one assumes that the brain is similarly arranged for the handling of spatial information and if one combines that with the idea, now scientifically accepted as I understand it, that life experience can or does alter our DNA, we arrive at the proposition that people living for tens of thousands of years in a landscape that makes awareness of direction crucial for survival may be born with brains that have acquired 'special provision' for processing spatial information. They would then be brought up in a society that puts particular weight on spatial awareness and thus maximises the expression of a gift of birth.

As you have stressed, there are many components to success on the AFL football field, such as sheer hard work, but that does not preclude the possibility that Aboriginal footballers are born with 'something extra'. We all originate from Africa, but anyone looking at the Olympic 100 metres final will have noticed that no matter what countries the competitors represent, they are nearly all people whose ancestors stayed put in Africa until a few hundred years ago. They also must have 'something extra' and I cannot see that acknowledging this amounts to racism -- your stance seems to require us to maintain that people of all races are born with the same characteristics.

I have no idea whether Indigenous people's spatial ability derives from more than upbringing, but it does seem possible. Why dismiss the suggestion as racist? As I see it, racism is the denial of opportunities to, or even persecution of, people on the grounds of their race. One can abhor such treatment while remaining open to the possibility that some races may be enhanced physically or mentally in some respects. Perhaps your position has less to do with scientific possibility than the fear that if genetic enhancements across a race were acknowledged, it might then be argued that there were also deficits -- deficits that would be all the more burdensome if those with them were made aware of their situation. It does not seem to me that genetic enhancement would necessarily be accompanied by a deficit but in any case, since the brain is plastic, such deficits should be made good by proper education in childhood.

These considerations are not altogether pleasant. They remind me of IQ tests alleged to demonstrate the intellectual superiority of some races and inferiority of others. However, I don't think this is a reason to argue that it is nonsensical, or racist, to hypothesise that Indigenous people's special spatial awareness may owe something to genetics.

4 months ago [report](http://theconversation.com/comments/185146/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Zac Hughes-Miller**](http://theconversation.com/profiles/zac-hughes-miller-98511)

Student

In reply to [Ian Davidson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185146)

It is 'soft' racism because of the implications that come with it, just as black athletes (in any sport worldwide) are labelled as having 'natural talent' we see similar numbers of white athletes described as 'gym rats' or 'hard workers' 'first at training, last to leave' etc.

When Bruce McAvaney describes a piece of play as a bit of magic (a comment almost always reserved for indigenous players, in fact they used to just say black magic) he isn't referring to a complex genetic/environmental…

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When Bruce McAvaney describes a piece of play as a bit of magic (a comment almost always reserved for indigenous players, in fact they used to just say black magic) he isn't referring to a complex genetic/environmental process of increased absolute spatial awareness, he's simply brushing it off as mysterious trick that's been pulled.

The technical side of the fast twitch/slow twitch muscle fiber debate in sprinting is interesting, and there might be a small genetic advantage in such a non-dynamic event. But at the end of the day i come back to the 'correlation isn't causation' maxim, the final of the 100m is proliferated by black athletes because the semi-final is and the heats are and so on and so on. Track athletics is a much bigger sport in the Caribbean and in Africa than it is anywhere else. Just because a Polo team is all white doesn't mean there is a genetic advantage to being white and playing polo.

Chomsky's black box of language is a much debated theory, though in it he suggests that we all have it 'hard wired' and that this evolves through experience to our mother tongue. He doesn't suggest that some groups of people have it hard wired and others don't. (at least from what i understand of it)

From what i understand, race is a very fuzzy concept genetically, and some even suggest that it doesn't exist on a biological level. I think the considerations become unpleasant when you start looking at difference as 'enhancements' or 'deficits', this article seems to be trying to highlight how Indigenous Australians approach mathematics may just be different, not 'worse'.

4 months ago [report](http://theconversation.com/comments/185159/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

Some decades ago, my wife (a teacher) told me that to teach writing the letter N to Warlpiri children they would describe it as a mingkirri (termite mound) next to a karlangu (digging stick). Small children were being taught in the vernacular at that time (none of this 'English only' nonsense).   
One group of children were looking at a blackboard on the east wall of the classroom during writing lessons.   
Subsequently these same children were in a classroom where the blackboard was on the west wall…

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One group of children were looking at a blackboard on the east wall of the classroom during writing lessons.   
Subsequently these same children were in a classroom where the blackboard was on the west wall of the classroom. They wrote the letter N in mirror image. Anyone that didn't know any better may have assumed these children were dyslexic, not that there is necessarily anything wrong with such, it is just that the assumption is wrong. These children had memorized the letter N as being a karlangu on the NORTH side of a mingkirri.   
"And yet, your Warlpiri kids perform atrociously.... " is an assertion made several times in this discussion. I believe such statements are also based on wrong assumptions. In real life (as in handling change in a shop) these kids vary from bright buttons to not so bright ones (as you'll find around the world with any group of children). I don't detect 'attrocious performance'. Their failing NAPLAN testing is no mystery to me, neither is it a valid basis to judge, steroptype and stygmatise them. These kids have the odds staked up against them enough already by the current socio-political environment.   
Anyway others have said it before and better:   
“To deny a people an education in their own language where that is possible is to treat them as a conquered people and to deny them respect.” (The Hon. Kim E. Beazley Sr., 1999)

PS-A lady that can't read and write none the less memorized the 10 letters that formed her name, so she could sign her Centrelink cheques. She consistently signs her cheques with her correctly spelled name.... in mirror image!

4 months ago [report](http://theconversation.com/comments/185240/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185240)

There's a lot in highly condensed information in this post Frank, and I just hope that readers will engage with all you'vewritten here thoroughly. Here are a just couple of possible comments. As you say, in all cultures there are children (who usually grow into older people) with soaring intellects and those who are not so bright - and of course, those in between - i.e. a continuum. The same applies to sporting and other physical ability. It needs to be stated that not all Indigenous kids are good…

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The short narratives that you've offered here about Warlpiri visual memory, and their use and application of cardinal directions, specifically in the context of learning to read and write, are marvellous. This material really supports the idea that when we learn new things, such 'new' learning perforce invariably takes place through the prism of one's existing epistemological framework. This is one of the many reasons why bilingual education for children in these communities where Aboriginal languages are still spoken as a first language, make a lot of sense.

The Kim Beazley Senior quote reminded me of one by the great African (Kenyan, I think) writer Ngũgĩ wa Thiong'o (b.1938), who of course is a symmetrical bilingual, fluent in his natal tongue and in English:

“The night of the sword and the bullet was followed by the morning of the chalk and the blackboard…Real power resided at all not in the cannons of the first morning but in what followed…the new school had the nature of both the cannon and the magnet. From the cannon it took the efficiency of a fighting weapon. But better than the cannon it made the conquest permanent. The cannon forces the body and the school fascinates the soul.”

- Ngũgĩ wa Thiong'o, 1986, Decolonizing the Mind: the Politics of Language in African Literature, James Currey Publishers, London.

4 months ago [report](http://theconversation.com/comments/185364/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185240)

Frank   
“To deny a people an education in their own language where that is possible is to treat them as a conquered people and to deny them respect.” (The Hon. Kim E. Beazley Sr., 1999)   
That is a legitimate viewpoint, but I have encountered a great many Aboriginal parents who do not want their kids trapped out of the modern world. That is why so much energy and fundraising has gone into being able to send these kids to Australian boarding schools. Personally, I think this issue is one that should resolved locally. But if you really think there is reason to cheer when your kid has the cognitive skills in the bottom 5% of the world outside the desert, yet he can play softball really well by his mastery of cardinal directions, then I suppose I'm happy for you. I'd be very interested to see where these kids are when they hit their 30th birthday.

4 months ago [report](http://theconversation.com/comments/185518/abuses/new)

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[**David Stonier-Gibson**](http://theconversation.com/profiles/david-stonier-gibson-91460)

**[David Stonier-Gibson is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_91460)**

Electronic Engineer/Small business owner at [SPLat Controls - electronic control systems](http://theconversation.com/companies/splat-controls-electronic-control-systems-1100)

One of the most fascinating things I have read for quite a while. I knew that a person's language is a major influencer of their "conceptual life". This show how it can also affect physical skills.

4 months ago [report](http://theconversation.com/comments/185327/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

A delightful and thoughtful piece ...

One of my treasured possessions - perhaps the only one actually - is a very very old piece of gidgee - a boomerang carved by a rock blade... no glass, no steel. Pre us.

And you hold it up in profile and there in simple wood is a bird wing - the very product of thousands of blackboards of scribbled calculations by Mr Bernoulli ... the thing that keeps 747's up.

Not bad for a mob with no use for numbers ... no words past three (really - a lot, more than we need, worth the walk). No waste this lot. Professional scientists - professional observers. Great geometry. Great mimics.

We don't know how lucky we are to have such folks amongst us.

4 months ago [report](http://theconversation.com/comments/185341/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185341)

Thanks for your post Peter - just one point: it's a furphy to say that Indigenous societies/languages had/have no numbers beyond three...I think that it's simply that that idea has been repeated so many times that people simply believe this to be the truth. For an example of a typical view, "their counting [is not] comparable to our elaborate numerical system. Indeed, it never exceeds 3..."(Von Brandenstein 1970:13).

In his article John Harris (Australian Aboriginal Studies 1987, number 2, available…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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In his article John Harris (Australian Aboriginal Studies 1987, number 2, available online; shall have to check the website address for you) disabuses us of this urban myth, by discussing counting in a number of Aboriginal communities.

In that article Harris discusses words for numbers in a number of Aboriginal languages, e.g. in Anindilyakwa, the language spoken on Groote Eylandt:

one awilyaba   
two arnbilyum   
three abiyakarbiya   
four abiyarbuwa   
five amngbala   
ten emembewkwa   
fifteen arnabuwkulakhla   
twenty wuwakiriyabulangwa

...and John Harris also cites research by Sobek (1981) who

"observed and recorded an extension of the Yolngu (Gumatj) [language] counting words by Galarrwuy Yunupingu to enable the labelling of all numbers up to one thousand two hundred and fifty (see Harris 1982:169-73). It has been suggested to me that Galarrwuy Yunupingu was only able to do this because he had grasped the principle of an infinitely extendable number system from Western schooling and that such an innovation had never been done before. Rudder (1983:94) claimed that Galarrwuy must have been using “quantitative thinking”. All this may be true but some caution should be exercised in passing judgement. Galarrwuy himself said that he was making the numbers to show that they could be created without European influence and using only Gumatj resources. He certainly demonstrated that it could be done and that linguistic raw materials were not lacking. According to Sobek (1981:26) the higher numbers were generally less meaningful even though their creation was understood, there being no traditional activity to which they could immediately be attached. This serves to illustrate the fact that although higher numbers may have been necessary only rarely, we should not conclude that they were never used or created at all." (Harris, 1987:35).

Having said this, it does need to be said that Aboriginal languages are definitely not as strong on number as they are on spatial terminology. All societies develop the maths they need; and as ours is a capitalist society we certainly need number...

4 months ago [report](http://theconversation.com/comments/185438/abuses/new)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185438)

All true Ms N... I should have put it in quotes. But it's the Newtonian physics of gadgetry like woomeras and the geometry of boomerangs that start one on a heretical path of questioning the real value of quadratic equations.

All in all a most adaptable and observant lot.

By the way you might be aware of the historical school that believes a large part of the game of Aussie Rules is derived from an Aboriginal game played with a stuffed possum skin. Fewer rules. More biff. No umpire. Like a Collingwood game.

The locals called it "marn grook" apparently with deep linguistic roots into the contemporary chanting of the hordes - "marn the pies"... well it's a hypothesis innit? There's a bit about us pinching the national sport as well here: <http://www2.brandonu.ca/library/CJNS/25.1/cjnsv25no1_pg215-237.pdf>

Genetics or wot????

4 months ago [report](http://theconversation.com/comments/185451/abuses/new)

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[**Steven Newton**](http://theconversation.com/profiles/steven-newton-12349)

Teacher, Student

I read and commented a little on this article from an education point of view and continued to read all responses and am really glad to see some genuine comments from different perspectives. Some very thought provoking comments that at times have both supported and ruffled my own views, great stuff. Thank you to the genuine conversationalists for helping me learn something.

A little disappointing however to read a few commentors that come across as very thinly veiled racism. I only hope you too have learnt something.

4 months ago [report](http://theconversation.com/comments/185349/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Steven Newton](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185349)

"A little disappointing however to read a few commentors that come across as very thinly veiled racism. I only hope you too have learnt something."   
Why are you "disappointed"? What do you hope they have learnt that they don't appear to have?

4 months ago [report](http://theconversation.com/comments/185490/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185490)

Thanks David - and I agree that we need to bring everything out into the open here, in the spirit of open discussion...Christine

4 months ago [report](http://theconversation.com/comments/185501/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Steven Newton**](http://theconversation.com/profiles/steven-newton-12349)

Teacher, Student

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185490)

It was more a comment pertaining to the link between racism and closed minded people.

4 months ago [report](http://theconversation.com/comments/185507/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Ian Davidson**](http://theconversation.com/profiles/ian-davidson-98492)

Retired

In reply to Zac Hughes-Miller

You are obviously steeped in sport and sports coverage. I am not, and so was unaware until I read your post that expressions such as 'natural talent' are being used as code to play down impressive performances by black sportsmen. The subtext seems to be that black and white sportsmen are not on a level playing field and that it is therefore reasonable to discount the efforts of black players. Given this state of affairs, it is difficult to make suggestions such as…

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I realise that race is a woolly concept but my suggestion is that over the course of 40,000 or more years separated from other populations, Indigenous Australians acquired genetic as well as cultural characteristics that now give their AFL players an edge over non-Indigenous players.

It is obvious that excellence in sporting performance depends on possessing the mental and physical traits that a particular sport calls on. With competition between white players, it would not strike commentators or followers of a sport as sensible to discount a spectacular performance on the grounds of the player's physique or superior mental powers. Why then in the case of Indigenous football players should it seem reasonable to do so just because the origin of their 'edge' is identifiable as characteristics they share with many others of their race? The very term 'gifted' applied to a non-Indigenous player implies the possession of characteristics they were born with -- in other words, inherited from their forebears. But since those inheritances are not marked by skin colour, no-one gives them any thought.

It strikes me that pointing out this inconsistency would be a far more effective counter to the discrimination Indigenous sportsmen are subject to than the present PC response of labelling it 'racist', as if race really is irrelevant -- in other words, as if it were axiomatic that all races are identical in all respects.

To put it more concretely, Indigenous players' response to dismissive remarks about 'natural talent' and the like, should be: 'Yes, I owe some of my skills to my forebears -- just as you do to yours. So what makes you think I should not be given credit for the skills I have just as you expect for the skills you have?'

As for my analogy with Chomsky's theory on language acquisition, I said nothing that implied I thought that some groups of people were 'hard wired' for processing spatial information and others were not. My argument was that there were grounds for hypothesing that the hard-wiring of Indigenous Australians in this respect had been enhanced.

4 months ago [report](http://theconversation.com/comments/185442/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Ian Davidson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185442)

Hmmm - 'natural' talent - that's a hard one, and there's so much in your response Ian, that I shall only take it bit by bit, and deal with only one aspect of it here.

Certainly, in my article I have not discounted the role of a person's physiology, body type, etc because clearly they play significant roles in any person's sporting achievement, and the specific sport that they might succeed in (gymnastics; cycling; Rugby, swimming; polo etc etc)- but body types, individual physiology etc etc vary…

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Hmmm - 'natural' talent - that's a hard one, and there's so much in your response Ian, that I shall only take it bit by bit, and deal with only one aspect of it here.

Certainly, in my article I have not discounted the role of a person's physiology, body type, etc because clearly they play significant roles in any person's sporting achievement, and the specific sport that they might succeed in (gymnastics; cycling; Rugby, swimming; polo etc etc)- but body types, individual physiology etc etc vary greatly WITHIN each of the so-called 'races', not just 'between' them (and Zac is right in stating that 'race' as a genetic/classificatory category is currently under a fairly level of contestation). Diet and poverty (and reversing the latter) can have quite a large impact on those aforementioned factors, too. And in all cases, while genetics quite clearly has an important role to play in terms of body type, physiology etc, those other factors are also extremely important.

My feeling is that what Zac was getting at in his post was the need for our society to move beyond the idea of 'unearned success', which is often the accompaniment of the attribution of 'natural talent' to anyone from any culture, whether their success be in the intellectual sphere or in the sporting arena, or both. Such attribution is more often the case when Aboriginal people excel at a sport than is apparent with other sporting stars - e.g. with the AFL we more often than not hear commentators discussing the (high) 'work rate' of certain non-Indigenous players - and I have never once heard it applied to an Indigenous player (though I could be wrong about that). To attribute any achievement to unearned success is, ultimately, to belittle it. For any player to reach that level of elite sport, they need to work hard...

Conversely, when something goes wrong and sporting stars of differing cultural groups 'bomb out' there is often a greater level of essentialist 'cultural' attribution to that failure in some cases.

Not wanting to sound like Grandma Moses (especially because someone in an earlier post indirectly suggested - incorrectly - that I had reached adulthood prior to WW2 - not that there would be anything wrong with that), but I'd like to relate an anecdote about tennis, a game I played competitively for many years (certainly not at the elite level though), and still watch avidly on tv.

I recall very clearly that when Evonne Goolagong played really well, won Wimbledon etc etc, she was warmly welcomed into the \*'imagined' Australian community as 'one of ours', and her achievements were widely heralded.

But when she had a bad day on the court, the Australian media was replete with metaphors/puns about her 'going walkabout' pretty well ad nauseam. All sporting figures, from the elite to the mediocre, can have lapses in concentration, but they don't have to confront statements of this nature. And while the Australian media has moved on in important ways since that time, as Zac pointed out in his post, there is still a similar edge to the comments (cf 'magic') today.

So this is the postcolonial environment in which we are working, in which we cannot discount the history of such remarks, and how the hurt that they have inflicted over a long time.

I'll get onto Noam Chomsky in another posting.

\*...Nation...is an imagined political community - and imagined as both inherently limited and sovereign. It is imagined because the members of even the smallest nation will never know most of their fellow members, meet them, or even hear of them, yet in the minds of each lives the image of their communion. (Benedict Anderson, 1983:5-6)

4 months ago [report](http://theconversation.com/comments/185464/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Ian Davidson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185442)

Ian: thank you for your thoughtful post. I've responded to you and John Clark in one post in considerable depth, although I’m aware that you may not find what I say convincing, but this response is specifically in relation to your final paragraph above, where you cited Chomsky's linguistics. I'm particularly confused by your final sentence, because in terms of his theory of linguistics, Chomsky is in fact a nativist. (For others who may be reading this, ‘nativists’ assert that some concepts, beliefs…

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Chomsky's theories in relation to linguistics at least (and this needs to be disentangled from his politics, which isn't always easy) are now largely discredited, and a large number of people even think that Chomsky himself doesn't believe them - and I'm sure you're well aware of this.

But where I'm really stuck on and confused about is your final sentence above: "My argument was that there were grounds for hypothesising that the hard-wiring of Indigenous Australians in this respect had been enhanced."   
- specifically the word 'enhanced' - is this pointing to a kind of Lamarckian genetics?   
It would be good if you could expand on your ideas here, because maybe I've just misinterpreted them...

3 months ago [report](http://theconversation.com/comments/185667/abuses/new)

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Citizen

Great article, Christine, and a reminder that knowledge and skill is often culture-based. I remember reading somewhere of experiments that showed indigenous kids to be whizzes at the "match the turned-down cards" game, compared with non-indigenous kids. This applied especially when the cards depicted natural objects - stones, shells, leaves etc, but also with conventional playing cards. The indigenous kids were trained from an early age to be keen observers of detail.

As for spatial orientation…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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As for spatial orientation, I know that I would rather be lost in the desert with an indigenous desert-dweller than a non-indigenous urbanite (not that the indigenous person would get lost, mind you). I wonder which would come out on top in a huge shopping mall. I, an urban whitie, often get lost in these places. I think they are planned that way. Perhaps indigenous people, with their heightened sense of spatial awareness, would do well here too.

Forgive me for my dimness, but I'm not clear on your "offside" references, despite knowing all football codes quite well. Yes, the offside rule features constantly in rugby, but in soccer it only applies near the goal mouth. The play can go on for some time before a potential offside situation occurs.

In fact, Australian football is quite like soccer in the way the ball flows up and down the field and across it, probably more so than in rugby. I grant that the oval shape of the AF field makes it more of a 360 degree environment, but I'd have thought soccer was pretty multi-dimensional too.

Anyway, I hope you'll post more articles relating to relative epistimologies. We can all benefit from looking at the world in a multiplicity of ways.

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Mike Puleston](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185448)

Thanks Mike, and having lived in two cultures very different than my own (on an Aboriginal settlement in northern Australia for many years, and also in Japan) I do agree that knowledge/skills are considerably more culturally based than I might have believed had I not had those experiences.

For example, not particularly relevant to this discussion, I recall one older Aboriginal man saying something that I will always remember. (The background to this is not there are no words equating to "please…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thanks Mike, and having lived in two cultures very different than my own (on an Aboriginal settlement in northern Australia for many years, and also in Japan) I do agree that knowledge/skills are considerably more culturally based than I might have believed had I not had those experiences.

For example, not particularly relevant to this discussion, I recall one older Aboriginal man saying something that I will always remember. (The background to this is not there are no words equating to "please" or "thank you" in any of the Aboriginal languages I know anything about. Instead, people do things for each other on the grounds of reciprocity/kinship and so forth). When discussing this cultural difference, he brushed it off by saying something to the effect of "Well,we don't want to become immersed in your begging cycle". That took me aback at the time but it goes to show how people sometimes interpret cultural practices very different from their own...

I cannot claim to be an expert on the "offside rule" so I will refer you back to an excellent post by Zac Hughes-Miller which you'll find above, in the comment section.

If you're interested in further reading with respect to alternative epistemologies, you and others might this article enlightening:

Boroditsky, Lera and Gaby, Alice 2010, ‘Remembrances of Times East: Absolute Spatial Representations of Time in an Australian Aboriginal Community’. Psychological Science. vol. 21 no. 11, pp.1635-1639

Here's the Abstract:   
  
How do people think about time? Here we describe representations of time in Pormpuraaw, a remote Australian Aboriginal community. Pormpuraawans’ representations of time differ strikingly from all others documented to date. Previously, people have been shown to represent time spatially from left to right or right to left, or from front to back or back to front. All of these representations are with respect to the body. Pormpuraawans instead arrange time according to cardinal directions: east to west. That is, time flows from left to right when one is facing south, from right to left when one is facing north, toward the body when one is facing east, and away from the body when one is facing west. These findings reveal a qualitatively different set of representations of time, with time organized in a coordinate frame that is independent from others reported previously. The results demonstrate that conceptions of even such fundamental domains as time can differ dramatically across cultures.

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Citizen

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185453)

Yes, Zac's posts are most informative. With the greatest number of on-field players of the football codes, and the possibility that you can get physically hammered hard from all directions, AF must develop a high level of 360 degree awareness. Conversely, a person with a high degree of 360 degree awareness would have an advantage in AFL, being able to get the ball away more quickly, and being better aware of where to put it.

There are probably implications for geometry, trigonometry, and calculus. AF = speed calculus?

Where do indigenous girls and women feature in all this?

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Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Mike Puleston](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185461)

Yes, indeed ref. the implications. I guess that the AFL field is the arena par excellence to demonstrate such skills, but certainly many of the Warlpiri girls/women demonstrate such skills on the basketball (yes, it was basketball, not netball) court - I used to play with the young women at Lajamanu and they were 'deadly' accurate in their throwing not only to one another, but goal throwing. This skill can be demonstrated to some extent in many sports.

By the way, for all of you AFL tragics, I have received a tweet from Adam Goodes about this article, which he has given me permission to share:

Adam Goodes

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**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185453)

Christine, nearly 200 posts later, and you still have not provided a scrap of evidence of Indigenous mathematical ability. And your attempts to argue superior spatial ability have in fact revealed the opposite. The Warlpiri (and others) are in fact hampered spatially as reflected in their languages, which are much lighter than just about ever other culture on earth, because the Warlpiri lack the relative directionality, without which, mathematics (such as geometry) becomes impossible.

4 months ago [report](http://theconversation.com/comments/185505/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185505)

Are you a Warlpiri speaker?

I'm sorry, if that's the case, I didn't realise that.

Then, please supply some examples or research to back up your argument.

Good wishes,

CN.

4 months ago [report](http://theconversation.com/comments/185511/abuses/new)

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Farmer

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185505)

Tell that fella who burned and sculpted my treasured boomerang that his geometry is "impossible"...

It took us a lot of serious arithmetic and physics to work that out. Same physics. Same concept. Offset leading edge, trailing edge, slightly concave lower surface. Not a formula or a blackboard in sight. Not a word written either.

An expression of eons of watching and doing and refinement and tradition. Empiricism without stats. And a very different way of seeing the world.

That said, there is nothing new or even novel about Aboriginal sporting prowess - from cricket through to boxing, racing, rodeos, football in various codes - bar soccer (?), tennis, more boxing and athletics.

I wouldn't rule out genetic potential at all. Nor do I discount the contribution of an equally nurturing sense of place - physically and spiritually.

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Farmer

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185528)

PS ... I'll bugger off in a tick ... but I tracked down a bit from a paper I read (on real paper) a long time ago... ethnomathematics ... a wonderful notion. I remembered the word and little else ... Now buried in this excerpt is a reference to some academic study - Kearins, 1977 ... demonstrating superior spatial skills by Aboriginal kids. So this difference seems to have been recognised a while back.

<http://www.aiatsis.gov.au/collections/exhibitions/ethnomathematics/docs/m0069594/m0069594_v_p13to18_a.pdf>

It's actually worth a read this.... excellent bit of observation. I remember coming across this when I was looking at Aboriginal economic concepts - and this Yolnu lot are particularly interesting because of their lengthy contact with Macassans, hence trade, markets and the concept and use of money.

Curious business this sweeping generalisation lurk.

4 months ago [report](http://theconversation.com/comments/185533/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185533)

You are right, Peter - Judith Kearins has made an important contribution to this field, as has Pam Harris (cited in my article). There's real problem with our dominant culture in terms of cultural memory in relation to Aboriginal education - so many worthwhile initiatives - and research either forgotten or ignored. Others I can think of who have contribute greatly in this arena are a number of people in the Yunupingu family group, Holly Daniels (from Ngukurr) Leon White, Stephen Harris and Beth Graham, and there are more, too.

There is a crying need for a volume on 'Best Practice' in Aboriginal education with contributions from Aboriginal and non-Aboriginal theorists and practitioners.

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185535)

Now surely there's a bit of funding around for that Best Practice volume Ms N?

Would seem rather essential as a stepping stone across any gaps I can think of.

Be interesting to have a piece from you in future about this notion that learning in local language part of the time somehow "imprisons" kids in outstations...either geographically or socioeconomically .. by providing a "second rate" isolationist basic training.

Given the sort of evidence-based approach you advocate I would imagine that is is perhaps a non-issue, but I have this sort of criticism from several sources now.

Doesn't appear to be true.

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185505)

Goodness gracious David! Have you been paying attention?   
"The Warlpiri (and others) are in fact hampered spatially as reflected in their languages, which are much lighter than just about ever other culture on earth, because the Warlpiri lack the relative directionality, without which, mathematics (such as geometry) becomes impossible."   
At first this statement made me angry. Very very angry. It flies in the face of much of what has been written in this forum. How silly of me. It was a joke! (as…

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At first this statement made me angry. Very very angry. It flies in the face of much of what has been written in this forum. How silly of me. It was a joke! (as in "you must be joking")   
My reaction should have been to break out into raucous laughter.   
In Warlpiri (E.& O.E.) ngalarinjaku is to laugh. Ngaju kana ngalari is I am laughing. Ngajarra (dual exclusive) kalijarra ngalari, we two are lauguing. Nganimpa (plural exclusive) kanarlungku ngalari is we are laughing at you.   
Many Warlpiri are masters of metaphor. In some regards the 'dreamtime' ( a highly inadequate translation of jukurrpa) is a mega-metaphor. I like to think some of it has rubbed off on me.   
Sport is governed by rules (as asserted by the very term 'Aussie Rules'). These forums are too, except the rules are unwritten.   
As a self appointed umpire I'm now issuing you with a red card. You've been consistently off-side, involved in dubious tackles and hit below the belt. Christine, please take a free kick. You're in contention to be declared Best and Fairest.

3 months ago [report](http://theconversation.com/comments/185567/abuses/new)

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Farmer

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185567)

I think Ms N is in the running for a Brownlow myself...

Speaking of running - one of the more interesting things about Adam Goodes style of play is his running - the sheer quantity of it - 20 kms a game + .... and we're not talking a gentle jogging or marathon pace here... we're talking short bursts of anaerobic work that leave you puffed or breathless ... that would leave me flat on my back twitching.

That is an astounding workrate - a Phar Lap of footy players. The guy must have the metabolism…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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That is an astounding workrate - a Phar Lap of footy players. The guy must have the metabolism of a jet engine.Which is where the genetics starts to get interesting ... particularly on mum's side of the show and extranuclear inheritance - like his cellular respiration rate and a whole host of critical physical characteristics - all from mum.

The other thing about Goodes is his anticipation and sense of place ... he's always there in the thick of it ... in front of the play ... sees where things are going and where he should be in 15 seconds time. Would that we could all run our lives with such forethought.

3 months ago [report](http://theconversation.com/comments/185593/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185593)

My late father was a geneticist, and while knowledge about genetics hasn't (unfortunately) been transmitted to me genetically (parenthetically just as a lot of what Kim Beazley Sr. stood for hasn't been passed on to Beazley the Younger), so therefore I can't claim expertise in the area, there are some things that I do know as a result - the first being that BOTH parents actually contribute to a child's genetic makeup! What I'm saying here (to some extent in jest Peter) is we can't make assumptions…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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However what you've said about this anticipatory skill on the part of some players (not only Indigenous players) really does speak to what I'm talking about in this article - premised on spatial ability, which in turn is the result of early learning. One more comment: all of the AFL players have to be able to run, so what I'm positing is really the extra edge that such heightened spatial apprehension can give a player... and it's that extra edge which is often what really differentiates the stars from the rest. But without question they all need to be excellent athletes even to make the elite levels of the AFL.

3 months ago [report](http://theconversation.com/comments/185598/abuses/new)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185598)

What a pity genetics isn't inherited Ms N ... a flaw in the system???

You're right of course both parents contribute to the fertilised nucleus equally... but there's more going on than just the nucleus... there's all this mRna stuff floating about out in the rest of the appalling egg business - hence extra nuclear - which does stuff all by itself ... no help whatsoever from dad ... ever ... any of them .... a straight line from mum ... all of them.... forever.

One of the things this extra…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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One of the things this extra-nuclear inheritance does is govern cellular respiration rates ... how efficiently and quickly we can burn energy, recover and do it again at a cellular level.

It's probably more complicated than that now - I'm out of touch ... but while mum and dad both contribute to your intelligence and eye colour and all that - it's not actually true that the genetic contributions are equal. How unfair is that????No wonder we blokes try so hard.

Now as for this business that all footy players can run - same for horses - but not all are endurance athletes of the calibre of Adam Goodes... or it'd take a lot of the mystery out of horse racing wouldn't it?

There is more to this athleticism business than running ...that's what Cathy Freeman was good at - round and round - up and down ...But with Goodes and some other elite players it is spatial and geometrical ... an understanding of flow and process and position... anticipation. It is something I was deeply lacking in my fortunately brief career - wandering about on a footy field like some kind of tourist.

I wonder what side of the family Goodes gets that sense of place from? Or is it a more complex subtle and social process than simple innate genetic transmission. Very much the latter I reckon. Be nice to know how to teach it.

3 months ago [report](http://theconversation.com/comments/185602/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185567)

Frank, I have been very clear and direct in responding to specifics posted here, so I have not only taken in what has been written in this forum, I have researched areas that were new to me, and I have responded to several posters and their ideas and claims. And you betcha I have posted 'flying in the face of [some] of what has been written in this forum.' A lot of it is philistine, vulgar, and plain wrong. So what is your problem? If you are very, very angry, you need to look to yourself for answers. All I have done is respond honestly to what's posted.

3 months ago [report](http://theconversation.com/comments/185723/abuses/new)

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[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185505)

Hi David,

Here's a start... lots of interesting reading here, from both perspectives: <http://tinyurl.com/lnyak7u>

3 months ago [report](http://theconversation.com/comments/187127/abuses/new)

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[**Robin Simson**](http://theconversation.com/profiles/robin-simson-98685)

Retired secondary educator at [Environmental education](http://theconversation.com/companies/environmental-education-1766)

Christine   
My experience in education convinces me that much mathematical teaching is boring and rarely relates directly to life experience. Not only indigenous students but all young Australians would enjoy maths classes a lot more if the teaching tapped into the child's interests. As you say AFL is awash with mathematics and you can build in related aspects of science like how wind speed affects the flight of the ball. My sport of orienteering is a wonderful vehicle for teaching maths - direction, distance, timing, speed, performance tables etc. etc. I would hope the implementation of the National Curriculum in mathematics brings about a more imaginative and enquiry learning approach to maths teaching.

4 months ago [report](http://theconversation.com/comments/185450/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Robin Simson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185450)

All I can say to this is that I strongly agree with your approach, and imagine that you've been a terrific and imaginative teacher...while some kids will always understand subject matter taught via a decontextualised approach, the kinds of activities you're discussing will rope in those kids who don't respond to that...

4 months ago [report](http://theconversation.com/comments/185455/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Robin Simson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185450)

Robin, if you were correct, David Beckham would have won the Nobel Prize for Physics by now.

4 months ago [report](http://theconversation.com/comments/185506/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**David Cordover**](http://theconversation.com/profiles/david-cordover-98687)

logged in via Facebook

I have a similar belief and wonder if this spatial awareness might also play out on a 'virtual field'... that of a chess board.

Chess is widely used in schools worldwide to teach various mathematical thinking skills, one of which is spatial manipulation (just try to visualise where a knight can move in 3 moves time).

I feel that chess would be a highly engaging tool (<http://www.winters-flat-ps.vic.edu.au/chess.html>) for teaching mathematical concepts to indigenous students. The fact that chess is a game and engages and excites students has also been seen to address issues of school truancy.

It seems to me there are a number of benefits, both educational and social, to the implementation of a chess program targeting indigenous students. What do others think of this idea?

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Cordover](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185454)

Thank you for your post.   
It seems to me that your comment makes a lot of sense - i.e. to teach chess to all children, including Indigenous children, but really someone (particularly a maths teacher, I would suggest) who knows more about chess than I, needs to respond to this.

David - can you cite any examples or research where teaching chess to kids has addressed matters such as school truancy, to which you allude? There may even be some studies outside of Australia that are in existence...over to you and others.

3 months ago [report](http://theconversation.com/comments/185617/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

To paraphrase K.Rudd: If I've veered somewhat off topic..."I'm Sorry!"   
Around 20 years ago the small locally owned company I manage, carried out a multi-client mineral exploration access track contract. Using a front-end loader we 'cleared' over one thousand Km. of access tracks starting from the Tanami road heading west to close to the West Australian border. This was mainly spinifex-country (manangarra). The spinifex had trapped windblown sand and combined with the countless termite mounds (mingkirri…

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To keep track of hours and distances (payroll and invoicing the workn etc) two of us kardiya (white-fellows) took turns to 'supervise' the project. It turned out to be a memorable experience to both of us.The rest of the team were Warlpiri men that took it in turns operating the loader, carrying out maintenance, ferrying fuel and supplies from Yuendumu etc. A fair bit of interest was generated amongs working age men, and Warlpiri men were quite generous in letting others "have a go" and/or "showing them the ropes"   
We had one of those 'black box' GPSs like used in the first Gulf War to mark and record the location of buried bodies. The lines ran along AMG (Australian Metric Grid- I think) co-ordinates. Parallel west-east lines were separated by 30Km, and further 'inland' we 'cleared' a few south-north lines to provide short cuts.   
On day one our vehicle with the black box headed out to be followed by the loader. We had a dozen punctures (the spinifex plains are like a minefield with hard wooden sticks and stumps from dispersed small shrubs).   
On day two, one of the Warlpiri men asked to be shown how that compass worked, he was told to look for (I think it was) 267 degrees (to allow for the magnetic declination in that area) which he did searching for an identifiable object 'on track' in the far distance. I refer you to the photograph of the "wide open space" in the article above- that's the kind of country it was (and presumably still is!).   
The fellow (incidentally all of these guys have names and it isn't because of the "them and us" paradigm that I don't use them) hopped on the loader and set off, when it came to someone elses turn (kilometres later) he might show the next fellow how to use the compass or point to a distant vague marker. That second day we had no punctures as the vehicle followed in the newly created track. At no time did our tracks veer more than the random error the U.S. military used to "insert" on purpose into the GPS system at the time.   
None of the Warlpiri men had licences or tickets (I think we're past the statute of limitation period!) that I can recall, nor did our loader have a roll cage. At first lights one of them would check the oil and water and air filters and apply the grease gun to the machine, pump in diesel, hop on and set off. The billy would be boiled by another and some meat cooked, a couple of others might set off to Yuendumu with the empty diesel drums.   
The fellow on the loader would be caught up with his tea and breakfast and a quick switch would take place and so on, all the way to sunset. All of this accompanied by much banter and laughter.   
Much interest was shown in the GPS even if it didn't tell them anything they didn't know already (as to where they were and in which directions everything else was), there was no problem in teaching them how to use it and record the numbers, but no great need to do so. The area we were operating in (such as Pakaru-kurlangu- the home of the Golden Bandicoot for want of a better translation- known as Highland Rocks on kardiya maps) was southward from the Granites Gold Mine. Someone might point in a northerly direction and say that that is where the Granites is, and sure enough as it got dark the faint glow of the mining operations could be discerned exactly were it had been pointed at.Those days most Warlpiri men had a rifle. The ability of many Warlpiri people to spot a kangaroo or bush turkey in the distance is uncanny. This has nothing to do with genetically enhanced better eyesight (the ravages of trachoma put the lie to that), just a different way of looking. A different cultural filter between the retina and the brain. The Australian Bustard is quite delicious.   
When I hear the ethnocentric utterances: "they don't want to work, they haven't been properly trained, why don't they show a bit of initiative? why do we waste our taxpayer's money on the bludgers?, don't they want to give their kids a proper education? ad nauseum, it reminds me of Kim Beasley's wise words:   
"In Australia, our ways have mostly produced disaster for the Aboriginal people. I suspect that only when their right to be distinctive is accepted, will policy become creative"…   
That project that I was priviledged to be part of those two decades ago, would be impossible today. Small locally owned enterprises are an anachronism in the multi-billion dollar Closing the Gap and the euphemistically named Stronger Futures days that are upon us. I'm afraid policy has not become creative.

4 months ago [report](http://theconversation.com/comments/185498/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185498)

Great post Frank.

Just a clarification: I'm guessing that you are referring to Kim Beazley, Senior, here rather than 'son of', i.e. the present ambassador to the US?

As you know, Kim Senior was an intellectual giant, and the Education Minister for the Whitlam Government, who has many credits, including the introduction of the bilingual education programs in a minority of Northern Territory schools.

4 months ago [report](http://theconversation.com/comments/185522/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185522)

Ooops, yes indeed Kim Beazley Senior.   
While I am at it:   
One of the furphys those of us to whom the advantages of 'Teaching in the Vernacular' is self evident are prennially confronted with is 'But they have to learn English if they are to move forward'.   
That is what BI-lingual (BI as in two, both) is all about. I'm yet to meet a Warlpiri parent or carer that doesn't want their child to learn English.   
At a meeting at which the then "4-hours English only" policy was being vigorously debated, one (outside) participant remarked "With Warlpiri you could never send a man to the moon". Japangardi's droll reply: "Why would we want to send a man to the moon?"   
A week later Japangardi said to me "Weren't the Russians first in space?"   
Yes, I told him. I'd recommend to the NT Department of Education they should introduce a "4-hours Russian only" policy.

3 months ago [report](http://theconversation.com/comments/185571/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185571)

Frank, even better would be 4 hours of Maths/Science. If this thread is to believed even 4 hours per WEEK would be a great improvement.

3 months ago [report](http://theconversation.com/comments/185722/abuses/new)

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[**Clare Towler**](http://theconversation.com/profiles/clare-towler-98695)

logged in via Facebook

Dear Christine,

Thank you for contributing this interesting article. I want to add some points which came to mind, and I would enjoy any responses.

The article seems to miss the fact that knowledge is not a thing, but involve ways of knowing – systematised practices that transmit knowledge over time and space. The point is that education is more than content, it is also process, and like any practice it is imbued with cultural assumptions and values, which determine how we can know in the…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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The article seems to miss the fact that knowledge is not a thing, but involve ways of knowing – systematised practices that transmit knowledge over time and space. The point is that education is more than content, it is also process, and like any practice it is imbued with cultural assumptions and values, which determine how we can know in the world. For example, that we can know through our relationships with Country (land) and with one another, as opposed to the decontextualised learning of the built environment (and its books).

The article seems to be situated within the “close the gap” discourse. This discourse, more broadly, is responsible for reducing Aboriginal people to statistical indicators in need of improvement to reach standards valued and imposed by the Australian state. I don’t deny that some Aboriginal and Torres Straight Islander people may want literacy and numeracy abilities, however to assume that everyone does and, furthermore, to impose a standardized curriculum imbued with one cultures values and priorities is perpetuating colonial relations of power.

The article suggests that the National Curriculum should incorporate “Indigenous knowledge” into the content of mathematics lessons. However, the curriculum is not written by and with Aboriginal and Torres Straight Islander students and communities, it is written for and about them. It seems that any (voluntary) incorporation of such knowledge is justified under a general claim to “reconciliation” and non-Indigenous people gaining an understanding of Aboriginal culture. As such, it is framed from the point of view of the coloniser rather than the needs, interests and rights of cultural groups. This standpoint reflects the underlying power relations. What happened to the concept of Sovereignty and self-determination?

Also, a minor point is that the diversity among Aboriginal and Torres Straight peoples and their knowledge systems is not emphasised. If Aboriginal knowledge systems are as diverse as the communities from which they emanate, the curriculum should reflect this diversity. But even suggesting this improvement ignores the politics of knowledge production and representation (like you said, there are different interpretations of Indigenous knowledge and contestations to the accuracy of certain claims, like "no number beyond 3"), as well as questions about the purpose of education, whether this purpose is desirable, and who benefits from this.

4 months ago [report](http://theconversation.com/comments/185513/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Clare Towler](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185513)

Hello Claire,

Thank you for your post. I particularly agree with your points about education needing to be about process, as well as the importance of bearing in mind the diversity of Aboriginal and Torres Strait Islanders, their communities, and in some cases, their practices.

There's a need to conceptualise Australia, BC ('Before Cook') amd even now, as akin to Europe, an agglomerate of many somewhat but not totally interrelated cultures...and to act on that in education.

4 months ago [report](http://theconversation.com/comments/185534/abuses/new)

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[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

Ian Davidson - You have much more eloquently expressed what I initially responded to Christine's post. It would seem now that scientific research is constrained by fear of charges of racism. I have an interest in the inclusion of indigenous Australians, but every time I try to formulate a statement or question, I end up discarding it. I am sure many others have also given up.

4 months ago [report](http://theconversation.com/comments/185564/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185564)

To Ian - and also John, re your thumbs up to Ian's genuinely considered post, perhaps the following points also need to be considered.

First - I do think that we need to think a little more deeply about knowledge acquisition, and apply it to this specific situation. In doing so, it's necessary to distinguish between the brain's capacity (and I'm talking about 'any' brain here, regardless of gender, 'race' etc etc) to grasp any kind of subject matter, via mental acts. We are all capable of…

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If we apply this to mathematical thinking, then the 'subject matter' of our mathematical thinking in the dominant culture is, as a result of processes of socialisation and acculturation, mostly concentrated on numbers and geometric forms, and our subsequent mathematical learning is founded on that platform.

But with those Aboriginal kids whose first language is an Aboriginal language, the subject matter that predominates in their early acculturation is to a much larger extent that relating to spatial relationships, even today, and to a much lesser extent, focused on number. (There are certainly implications here for non-Indigenous teachers of maths teaching ‘number’ to those kids, to find innovative ways of introducing number – but also, equally innovative ways of teaching the cardinal directions to many non-Indigenous kids who aren't so strong in that area). So, for those Indigenous kids, the stronger 'platform' for future mathematical learning is that of spatial relationships. And in terms of this article, once we have acquired that deep cultural knowledge that is socialized into us from birth, we can \*\*\*seemingly\*\*\* act on that knowledge unconsciously and automatically, which fools us into thinking that it's innate. But it might just be that we spent 1,000 hours at primary school on our times tables.....that leads us to act like automata around such knowledge, and have nothing to do with our brain’s capacity to perform mental acts of another kind.   
Although the individual's intelligence (regardless of background) does plays a role in this, it is important to factor in the distinction that I've made above. We often don't seem to realise that our individual ideologies/philosophies sometimes colour our understandings. One has to be like an anthropologist applying the anthropological gaze to our own culture here.

Even the question of what actually constitutes science/maths is a cultural byproduct - for example, NOT to put spatial thinking and prowess into the 'category' titled mathematics is a result of our often unconscious ethnocentrism. It is easy to be ethnocentric about some things (and every single human society is and can be) once we have acquired knowledge at such a deep level, because we act upon that so apparently easily and automatically.

I don’t think that either of you will be 100% satisfied with my response here, but the main gist of what I’m saying is that in terms of knowledge and language/concept acquisition, it is not so easy to disentangle nature from nurture, which I know from my father (a geneticist) is what a lot of, if not most, geneticists think too.

I suspect that this topic is ultimately beyond the bailiwick of all of us…but I do hope that at least this clarifies my thinking on this matter somewhat.

3 months ago [report](http://theconversation.com/comments/185647/abuses/new)

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[**Ryan Manhire**](http://theconversation.com/profiles/ryan-manhire-98389)

Student

A very interesting and thought provoking article. While being almost proud of being an 'Australian' who has no interest in our unique take on football, I can definitely picture in my head the points you are making about movements over the 360 degree playing field and the constant locational checking that would come into account. I also had no knowledge of the specifics of various Indigenous players' approaches to the game through their - taught - spatial and directional positioning techniques…

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As you mentioned, any process of (Re)Conciliation for Aboriginal and Torres Strait Islander peoples requires that the dominant culture appreciate the specific cultures, case by case, for these peoples and where it is still possible to be taught from their own languages and from their own cultures. So if the language and the mathematics - or whatever else it may be - is in tact, it should be encouraged as something to be learnt and shared, not put in the 'too hard' basket.

I would also add that as well as being a great way to get more non-Indigenous children (and their parents, and their friends etc) interested in and able to learn from Indigenous languages and mathematics, at the professional and highly publicised level of the AFL - even I know there is an Indigenous Round - there could be a real push to actually educate the wider public about things such as the Indigenous vs non-Indigenous approach to basic movement over the field.

Personally I think the more everyone knows the better. Australian cultures and languages - those that remain of the 250 or so before invasion - are incredibly fragile, and I think any move away from making the most of what is left is a mistake. So I would be all for Indigenous mathematics - and knowledge in general - making it into schools in a large - but accurate - way. The even tougher job would be to educate the public at large, but that doesn't mean it isn't worth doing.

3 months ago [report](http://theconversation.com/comments/185627/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Ryan Manhire](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185627)

Thanks for this post Ryan, in which you make a number of really valid points, including that of non-Indigenous Australia needing to educate ourselves further about Indigenous Australia, and value perspectives that differ from those of the mainstream. In a sense the only reason the chosen exemplar is AFL here is because, as you note albeit indirectly, Australia is such a sports-crazy country, and that might constitute a good and accessible entree into the differences in mathematical understandings…

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3 months ago [report](http://theconversation.com/comments/185669/abuses/new)

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[**Ian Davidson**](http://theconversation.com/profiles/ian-davidson-98492)

Retired

In reply to Christine Nicholls

Thank you for that reply, Christine. What you say amounts to an expanded answer to one of my original questions, namely what grounds there were for classing Indigenous Australians' remarkable spatial skills as mathematics. I now see Indigenous Australians' spatial awareness as their brain's mathematical capacity applied to the circumstances in which they live -- circumstances very different from those that gave rise to our mathematics.

Your explanation makes it…

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In reply to Christine Nicholls

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Your explanation makes it clear how significant it is that the mathematics non-Indigenous children encounter at school 'ties in' with the world they have experienced beforehand. Such a link does not exist for Indigenous children, so if they are to have any hope of grasping Western mathematics their instruction needs to enable them to leap a cultural divide. Hopefully that can be done while making sure they recognise the value of their spatial awareness and do not allow it to slip away.

As for the sentence at the end of my reply to Zac Hughes-Miller, you may have been right to be 'confused' about it. I was indeed invoking a revival of Lamarckian thought. The sentence was a reference to a fuller account of my proposition in the posting to which Zac was replying. It read:

'If one assumes that the brain is similarly arranged [i.e., hard-wired] for the handling of spatial information and if one combines that with the idea, now scientifically accepted as I understand it, that life experience can or does alter our DNA, we arrive at the proposition that people living for tens of thousands of years in a landscape that makes awareness of direction crucial for survival may be born with brains that have acquired 'special provision' for processing spatial information. They would then be brought up in a society that puts particular weight on spatial awareness and thus maximises the expression of a gift of birth.'

I have only a passing familiarity with these issues, and acknowledged that I was merely floating an idea. What prompted the idea was my awareness of evidence that traits acquired by a parent during his or her life can be passed on to a child. As I understand it, this come-back for Lamarck is about mechanisms that affect the expression of DNA, but how much relevance this might have for the part or parts of the brain dealing with spatial awareness I have no idea.

In this connection, I would be fascinated to hear whether non-Indigenous kids growing up alongside Indigenous kids, and thus being fluent in the language, have developed the same acuity in determining direction. If they have, that would be strong evidence that one need look no further than upbringing to account for Indigenous people's spacial awareness.

3 months ago [report](http://theconversation.com/comments/185729/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Ian Davidson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185729)

Ian, thank you for your generous post. Regarding your post, with respect to the sentence: "Your explanation makes it clear how significant it is that the mathematics non-Indigenous children encounter at school 'ties in' with the world they have experienced beforehand..." nails down several important aspects relating to learning/education generally, the first being that anyone of any age can only ever go from what is 'known' to the unknown, by building on what is already known, in terms of successful…

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Ian, thank you for your generous post. Regarding your post, with respect to the sentence: "Your explanation makes it clear how significant it is that the mathematics non-Indigenous children encounter at school 'ties in' with the world they have experienced beforehand..." nails down several important aspects relating to learning/education generally, the first being that anyone of any age can only ever go from what is 'known' to the unknown, by building on what is already known, in terms of successful 'new' learning; but also the fact that there needs to be some parental/familial/ broader social reinforcement for learning to occur - especially in the case of young kids, decontextualised learning (or should we say, learning in a social vacuum that isn’t reinforced outside of the classroom) is not likely to lead to educational success in the areas where that’s the case.

The other quick comment I'd like to make is about your very interesting comment about non-Indigenous kids who grow up with Indigenous kids and learn to speak Aboriginal languages fluently from early childhood. First, one would need to factor in the source of those kids’ PRIMARY socialisation - does that occur through other kids of their same age, or mostly via their parents/extended families whose cultural norms - and mathematical practices, to bring it back to this specific discussion - are very, very different from those of the Aboriginal kids who are their friends/mates? These are complex questions to which there is probably no easy answer.

I do hpwever suggest that you address this question directly to Donovan Baarda, who has been a respondent to this discussion, & is the son of Wendy Baarda, cited in the article, and of Frank Baarda, who has also contributed some terrific posts to this discussion. I would ask Donovan directly to respond to that question - which would require replying directly to his posting above - and I would be as interested as you in his response. (I have not seen Donovan since he was a little kid, but I understand that he is now working in an area that does require superior mathematical/scientific skills). I will wait his response with the greatest interest - and your back to him!

3 months ago [report](http://theconversation.com/comments/185850/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Ian Davidson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_185729)

Responding, indirectly, to Eva's post (please see below), and of course, more directly to yours, both this one and an earlier one from you, & in the interests of coming up with a summary of all of this correspondence, one of the threads in the correspondence to this article has been whether or not what I've categorised as 'maths' with respect to what I've described as 'Indigenous maths', is actually 'maths' by the criteria applied by the dominant culture.

Without repeating my own view (which I think is obvious by now!) I'm wondering whether you could elaborate on your current position - and others may wish to do so, too.

3 months ago [report](http://theconversation.com/comments/186519/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Ian Davidson**](http://theconversation.com/profiles/ian-davidson-98492)

Retired

In reply to Donovan Baarda

Donovan, last night in reply to a post by Christine Nicholls, I wondered aloud whether a non-Indigenous kid growing up alongside Indigenous kids, and being fluent in their language from early childhood, would acquire the same direction sense as his mates. This morning, Christine posted a reply recommending that I query you on this. Your experience certainly fits the bill, growing up at Yuendumu and now working in a big way in the Western numbers realm as a software engineer…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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So can I ask whether you sensed as a youngster that your spatial awareness was the same as that of the Warlpiri kids you were mixing with? Would I be right in thinking that you wouldn't have been conversing effectively with them without having the same strong sense of direction? And would you have been as capable as they were of initiating statements related to direction as opposed to merely understanding them?

And two final questions: Do you still have much or all of that direction sense? And do you have any way of gauging whether the Warlpiri mathematical mindset related to space has influenced your mathematical awareness or capability in the Western sphere?

I await your answers with much interest.

3 months ago [report](http://theconversation.com/comments/186017/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

Hi Christine,

I read your article with interest as an environmental scientist, and with a particular interest in traditional land management practices. You might be interested in the spatial and meteorological skills involved in patch burning in that they are relevant to your interests:

<http://www.unep.org/maweb/documents/bridging/papers/burrows.neil.pdf>

3 months ago [report](http://theconversation.com/comments/186092/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Gail Carnes](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186092)

Thanks for your post Gail, environmental scientist, and I hope that many readers will open up the link that you’ve provided here & read that article thoroughly. It strikes me that the article you’ve suggested ought to be compulsory reading for all Australian volunteer (and of course professional) firefighters, in terms of offering guidance in developing, implementing and managing fire regimes in Australia today. While of course this approach cannot be duplicated willynilly today, because of changed…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thanks for your post Gail, environmental scientist, and I hope that many readers will open up the link that you’ve provided here & read that article thoroughly. It strikes me that the article you’ve suggested ought to be compulsory reading for all Australian volunteer (and of course professional) firefighters, in terms of offering guidance in developing, implementing and managing fire regimes in Australia today. While of course this approach cannot be duplicated willynilly today, because of changed circumstances (built up areas etc), nevertheless many of the basic principles still subsist in 2013 and beyond, including the need for:

\* human-controlled ignition & management of fire (cf the high level of Aboriginal control over fire, as opposed to just letting the forces of nature prevail & do their worst).

\* knowledge of wind direction;

\* knowledge of germination of plants by means of fire;

\* maintenance of biodiversity via controlled burning;

\* and more.

This article, and others that have been cited here, do also point to the need to reconceive the boundaries of science and maths to include such Indigenous knowledge to a much greater extent than is the case at the present time. And finally, such knowledge, and whether it is included or ignored, also has important implications for the forthcoming Australian national curricula in maths and science...

3 months ago [report](http://theconversation.com/comments/186226/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186226)

Not as simple as it sounds Ms N...

Take this business... " \* knowledge of germination of plants by means of fire; maintenance of biodiversity via controlled burning..."

Now I've worked with some very clever chaps trying to put this stuff back together using our science and maths. We survey the living daylights out of a place and then start reading up on what was known about fire, seeds, flowering and the like. Some would be killed by fire outright, but needed fire to germinate - provided…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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In other words lots of moving targets - incompatible choices, levels of acceptable loss to secure germination... complex systems... lots of variables in vegetation, in fires, in timing and season...

This is not how Aboriginal knowledge was collected and passed on or practised. Countless observations had become ritualised - codified into patterns of movement, into stories and songlines into commemoration, part religious obligation part housekeeping.

But the knowledge was extraordinary. Like this: The locals around Mudgee would make an assessment of the wattle bloom each year. If it was a decent show, they'd head off 50-100 miles to the coast to rebuild their beachfront fishtraps, party on and gorge themselves on a bumper annual tailor run for a month or so. This is perhaps the roots of that ongoing Australian holiday tradition - the caravan park, the weekender, the ritualised holiday by the beach.

Our science shows that the movement and size of the tailor run is heavily influenced by weather patterns - notably el-nino and la nina. Brings them in closer to the beach. Now what exact link this has with the relative happiness of wattles near Mudgee I'm not sure - but I'll put serious money down that it is.

Much harder to put this stuff back together with science once it's gone. And the "it" isn't just a knowledge and practice ... it's the life, culture, beliefs, customs and traditions.... how they lived. And that is disappearing fast. No not disappearing - changing.

3 months ago [report](http://theconversation.com/comments/186244/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186244)

Thank you for this valuable post, Peter - one of the most important aspects of which is the interrelatedness of aspects of (in this case, environmental) knowledge in areas/matters that at first glance may appear to be totally unrelated. I think that the integrated nature of some matters that we often tend to think of as existing in individual compartments is what you're alluding to here - please correct me if this is not a fair assessment.

Just to clarify my own position, I certainly wasn't trying…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thank you for this valuable post, Peter - one of the most important aspects of which is the interrelatedness of aspects of (in this case, environmental) knowledge in areas/matters that at first glance may appear to be totally unrelated. I think that the integrated nature of some matters that we often tend to think of as existing in individual compartments is what you're alluding to here - please correct me if this is not a fair assessment.

Just to clarify my own position, I certainly wasn't trying to put forward the view that any of this is 'simple' stuff, and I do have the greatest respect for what many farmers are doing in this and related areas, today. There is real environmental leadership from some members of this group, perhaps contrary to popular opinion. In addition, I'm aware of the role of fire in the germination of some seeds, and the complexity of it all.

On the other hand, it just isn't an option to give up on all of this, and that's what's terrific about this discussion - that most people are committed to grappling with these huge issues, rather than just giving up on them...

3 months ago [report](http://theconversation.com/comments/186293/abuses/new)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186293)

Oh no Ms N ... I wasn't doing this horny handed son of toil lark then ... I was rampaging through the NSW National Parks and Wildlife Service ... playing with botanists and mathematicians and biologists and the like... doing things like looking at fires and long term conservation outcomes for say a patch of some useless, fragile, pathetic plant on a Threatened Species List... how often to burn the place so that those banksias regenerate but not so you'll kill all the baby angophoras... some of them…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Oh no Ms N ... I wasn't doing this horny handed son of toil lark then ... I was rampaging through the NSW National Parks and Wildlife Service ... playing with botanists and mathematicians and biologists and the like... doing things like looking at fires and long term conservation outcomes for say a patch of some useless, fragile, pathetic plant on a Threatened Species List... how often to burn the place so that those banksias regenerate but not so you'll kill all the baby angophoras... some of them the more burning the better if it's fast and cool... totally unmanageable really.

But if we don't learn to do it we lose it ... I just came back from a trip up the road to a stamping ground of my childhood - a steep guttered slope with an absolute gut buster incline. 50 years back it was a track through dense ancient rainforest with giant nettle trees, vines and tree ferns ... buttressed trunks reaching into the darkness. Now it's all eucalypts and wattles...hot, open and sunny ... nothing whatsoever remains of the ancient forest save for gullies and isolated remnants. Hot, open, sunny and oh so flammable.

Hopefully we're getting better at managing landscapes. Better at doing all sorts of things really. Doesn't stand still. Not much does.

3 months ago [report](http://theconversation.com/comments/186340/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186340)

It would be good to have the environmental scientist, Gail, comment on this, because undoubtedly she knows a lot more than I about these matters...over to you, Gail...

3 months ago [report](http://theconversation.com/comments/186347/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186244)

Of course, it's not simple, Peter. Dr Nicholls wasn't implying that it is. I think we all agree that traditional knowledge can't be easily codified. The tools for capturing and communicating such knowledge are limited, plus there are IP issues to consider. We can take that as a mutual understanding and then still have a conversation about school curricula, which is what this is about.

3 months ago [report](http://theconversation.com/comments/186674/abuses/new)

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Farmer

In reply to [Gail Carnes](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186674)

It's also about what we recognise as "useful knowledge" Gail. There's much more to this than reducing truancy and improving individual educational outcomes.

To hear some pundit's pronouncements you'd think the only things worth teaching or learning are directly oriented towards employment, skills and earning a quid. But the fact is we actually don't know what is important or useful, or what will become so. It is not our knowledge to teach.

Certainly not simple but making every effort to nurture and protect what remains of traditional culture and knowledge is surely part of the job - beyond even an exclusive focus on the individual and their future employment.

And we can't teach that - can't even recognise it when we see it. So no not simple at all.

3 months ago [report](http://theconversation.com/comments/186703/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186347)

I'm no expert on traditional knowledge systems, but I do have a keen interest in this area. There's been some work done by CSIRO and the Bushfire CRC towards developing a bayesian belief network model for compiling traditional knowledge, which, as Peter states, is multi-layered and linked throughout. Peter's also correct that burning for ecological reasons is very complex for those who don't have tens of thousands of years of knowledge passed on to them.

Peter's perspective on "useless, fragile and pathetic plants" on the threatened species list is, I'm sure, meant to be humorous because, considering how little is known about ecological linkages and connections, as Peter himself agrees, we're certainly in a weak position from which to proclaim any particular plant species "useless."

3 months ago [report](http://theconversation.com/comments/186704/abuses/new)

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Farmer

In reply to [Gail Carnes](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186704)

Well spotted Ms C ... yes it was a veiled effort at humour - but I have had these discussions with property developers and landholders regarding "useless" plants and animals...

And a lot of folks - some explicitly others less so - reckon that traditional knowledge and culture - from language through to sense of place and lessons on interacting with the environment - are all useless... irrelevant, backward-looking, politically-correct and "useless".

From where I sit it's exactly like throwing away 50,000 years worth of field notes... encoded and encrypted in stories, myths, songs and social behaviours - but observations made by serious professionals ... watching stuff for a living. Like burning down the library at Alexandria again.

I sincerely hope that you clever lot can find some way of keeping this stuff about - maintaining our resilience as a species if you like.

3 months ago [report](http://theconversation.com/comments/186748/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186748)

Ah yes, the old 'Aborigine as museum piece' trope. Second only to its cousin, the 'Aboriginal zoo'. Sometimes, getting rid of old ideas (like these two) is an ethical priority that trumps your own acknowledged ignorance of 'useful' knowledge.

3 months ago [report](http://theconversation.com/comments/186882/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186703)

Peter - I have to agree wholeheartedly with your philosophical position on what actually constitutes 'useful knowledge' - and that we don't know how much we're losing out by placing tight parameters around what's generally socially classified as 'useful knowledge- sleepers, awake!

3 months ago [report](http://theconversation.com/comments/186903/abuses/new)

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Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186748)

I took that comment as tongue in cheek! On a more serious note, could you please provide us with some information about what you're working on in terms of your work as a farmer, that has a direct bearing on the current discussion?

3 months ago [report](http://theconversation.com/comments/186904/abuses/new)

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Farmer

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186882)

Excellent - a trope!

Nope David ... a straw trope I'm afraid.

As for the ignorance of what in the end turns out "useful"... I plead ignorance along with the rest of us not gifted with prophesy.

It is inevitable - desirable - that traditional life of scattered homelands and isolated communities change. Particularly on health, education and opportunities. No static museum exhibits at all... but a knowledge of what has gone before might be rather handy at times.

For example - one of…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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It is inevitable - desirable - that traditional life of scattered homelands and isolated communities change. Particularly on health, education and opportunities. No static museum exhibits at all... but a knowledge of what has gone before might be rather handy at times.

For example - one of my curious byways in economics involved having a look at sustainable farming - kangaroos in particular. Cue jokes about damn big fences and hopping dogs...Now about the most sensible way to do this is free range and lots of it. With lots of diversity and water holes scattered about. And you turn up with a net on a truck and a mobile export graded abattoir/ packing plant and start catching. You've gotta know where they are and provide enough diversity of habitat - if nothing else, sufficient fodder and water in certain places - to ensure that they hang around and prosper. More importantly that they can retreat and rebound in cyclical weather patterns.

Now knowing a bit about how to do that - how to cultivate patches and billabongs which once established will "look after themselves" - would be rather useful. And it requires a lot of study. Or a few local old folks with a box of matches.

Just different ways of making a quid from your IP. Landscape productivity consultants... there that better... more legit? $350 an hour. They bring the matches.

Now these "old ideas" you are so keen on getting rid of ... bit like book-burning isn't it? - aren't so much old as ancient David... and they have permitted this lot to survive and understand this place in a most intimate way.

True they do not express this knowledge in formulae and data ... not directly. They express it when you are driving a Nissan load of old fellas through some bush and come to a really lush well- established patch of regrowth and they all fall silent and sad... only to later have it explained that this area was significant and that it had been neglected and allowed to go to seed ... quite literally. Needed a good clean-up.

We have very different ways of looking at things - the bush in particular. The locals of various parts I've had dealings with over the years seem to have a combination of utilitarianism and ritual attachment... that is, they view the bush both as a larder/supermarket and as a monument to what was ... a living message if you like ... theirs to keep in good nick.... make sure the roos stay about and the trees don't get too thick.

Now some of that knowledge - maybe all of it - could prove useful - both economically and ecologically - and it should not be undervalued.

If we had managed to hang onto a few more ancient wisdoms rather than burning them - like yer Greeks and yer Arabic mathematicians - not to mention your Incas and your Indians we might know how to do things a bit better and avoid their mistakes.

Kids today - no respect for anything that isn't on Twitter.

3 months ago [report](http://theconversation.com/comments/186912/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186912)

Peter,   
In case you haven't come across it:

“Cultural survival is not about preservation, sequestering indigenous peoples in enclaves like some sort of zoological specimens. Change itself does note destroy a culture. All societies are constantly evolving. Indeed a culture survives when it has enough confidence in its past and enough say in its future to maintain its spirit and essence through all the changes it will inevitably undergo. ”   
― Wade Davis, The Wayfinders

An excellent book (subtitled "Why Ancient Knowledge Matters")

Being enmeshed in our ("western") culture which includes such bizarre concepts as "time is money"   
I can't elaborate, even if I'm finding this a scintillating discussion.   
So here's my latest two bob's worth (ha ha ha 20 cents, wonder how much that is in minutes and seconds, and how can I explain this to my Warlpiri friends?!)

3 months ago [report](http://theconversation.com/comments/186976/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186976)

Frank, you raise a very important issue re 'time is money'. This thread is about Aboriginal exceptionalism in spatial cognition. I am no expert myself, but I have read and heard much about Aboriginal difference when it comes to understandings of "time" as well.

3 months ago [report](http://theconversation.com/comments/187013/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187013)

To get an inkling as to the different conceptualisation of 'Time' in different cultures you can't go past Steven J. Gould's book 'Time's Arrow Time's Cycle'.   
After I read it, I came just that little bit closer to understanding where my Warlpiri friends and neighbours were coming from.   
Another two-bob's worth:   
I've come to realize for instance that an English sentence such as "A long time ago in the Dreamtime" is a bit of a nonsense.   
Not that Warlpiri doesn't have words related to time. Most Warlpiri people are bicultural in a sense they can function in the 'western' time's arrow environment.   
To get your head around time's cycle just ask yourself what will it be two seasons from now. Then ask yourself what was it two seasons ago. Presto! Go back in the past and sally forth into the future, you arrive at the same destination....

3 months ago [report](http://theconversation.com/comments/187045/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187045)

Oh good god Frank, I am more than sensitive to the nuances and contradictions of 'time's cycle'. Come on, I am a denizen of the 'dominant culture', the very culture built on the thoughts/works/teachings of Homer, Herodotus, Aeschylus, Zeno, Thucydides, Polybius, The Bible, Ptolemy, Roman Catholic Church, Newton, Einstein, and postmodernism.   
Please, I'd tell you all about time, alright, except I haven't got the time.

3 months ago [report](http://theconversation.com/comments/187060/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187045)

In other words, just as this thread worked out how differences between traditional Warlpiri spatial understandings and those of the 'dominant culture' are relevant to understanding the challenges the Warlpiri currently face, perhaps differences in temporal cognition might shine even more light on how to approach those challenges.

3 months ago [report](http://theconversation.com/comments/187064/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187060)

David,   
I wasn't having a go at you.   
I merely used this space to address the multitude in case they hadn't heard of Steven Jay Gould's book.   
I found it so illuminating that I wanted to share it with those that hadn't stumbled on it.

3 months ago [report](http://theconversation.com/comments/187074/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

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Farmer

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187074)

And this small corner of the multitude says thanks... heard of it - seen it mentioned in dispatches...never read it ...I shall impose on the vast Resource Base of the Woolibuddha Public Library and see how we go.

3 months ago [report](http://theconversation.com/comments/187080/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186748)

Peter,   
This isn't really a reply or a comment, just couple of anecdotes (yimi-jarra) that your comments make me think you may enjoy:   
A white-fellow friend (F) went out "bush" with a mutual Warlpiri friend (WF) on a bright sunny day. WF told F "This is perfect roo hunting weather". On a subsequent trip on a miserable cold drizzly day WF told F "This is perfect roo hunting weather". "Aha!" said F, and pointed out the contradiction to WF. WF then proceeded to tell F at length and in great detail how kangaroos behaved in differing places under different weather conditions. In short, ALL weather conditions are perfect for roo hunting, providing you know how the kangaroos behave.

In my wife's ESL class a drawing of a speeding kangaroo with the caption "Marlu ka pangka-mi kakarara pura" (again E.&O .E.) (the kangaroo is running towards the east), a little girl rendered the following English translation: "A meat running away"

3 months ago [report](http://theconversation.com/comments/187087/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186703)

Traditional knowledge itself is one thing, but knowledge systems, or ways of thinking, are another. There are, of course, different ways of viewing the landscape and taking in information from it. There are different ways of sensing the orientation of one's body in three-dimensional space. These ways are teachable because they are taught. They're taught to children every day, and will be for as long as a particular body of knowledge exists and there are people around to teach it.

As for how useful traditional knowledge is, it's fairly clear that far more useless was the ecological knowledge Europeans brought with them to this continent, now the most desecrated on earth.

3 months ago [report](http://theconversation.com/comments/187097/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186748)

The odds are not overwhelmingly in our favour.

3 months ago [report](http://theconversation.com/comments/187099/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186748)

"From where I sit it's exactly like throwing away 50,000 years worth of field notes... encoded and encrypted in stories, myths, songs and social behaviours - but observations made by serious professionals ... watching stuff for a living. Like burning down the library at Alexandria again."

Very well said, Peter. Yes, serious professionals, indeed, and whose lives depended on their knowledge.

The perspective of a farmer is an interesting one. How do you reconcile the destruction of habitat with the need to feed the current inhabitants? Obviously, you'd want to do it as sustainably as possible. How do you keep "sustainable farming" from becoming an oxymoron?

3 months ago [report](http://theconversation.com/comments/187105/abuses/new)

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[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187087)

That's a funny story! I have a similar one. I was a with a group of Cambodian orphans who were visiting Australia, and for one afternoon's outing we took the to the zoo.

The kids were amazed by the specimens on display: kangaroos, giraffes, zebras. "What kind of meat is that?"they asked, pointing here and there excitedly...

Yes, on one level we're all just meat, either running away or placidly existing in our enclosures.

3 months ago [report](http://theconversation.com/comments/187112/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

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Farmer

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187087)

No such thing as a "useless" animal there then! How delightful! I will file it away under youthful utilitarianism.

I remember watching a couple of kids up a tree helping themselves to a hive of honey - absolutely smothered in the stuff ... hair, eyes, noses, ants ... and grinning like they'd just walked into a chocolate shop to find it unattended. What a life.

One of the things that has always confounded me is related to food preparation. Now I'm a bit of a botany buff and some of the…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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One of the things that has always confounded me is related to food preparation. Now I'm a bit of a botany buff and some of the plants, roots and seedy bits these folks eat are downright toxic. They require quite careful and precise treatment such as cycles of blanching, sun or fire drying, soaking and the like to make them eatable if not edible.

But when it comes to the actual business of cooking - talk about slack... some of the islander folks get a bit imaginative with fish but for the rest of 'em, they are the original meat and three veg - or no veg at all if possible - bung it on a fire and singe the skin off ... what is it? doesn't matter. And volume counts.

So it's a strange business to have identified complex techniques for making things like fern roots and pandanus seeds non-toxic, but never to have bothered with a recipe of any sort, nor to have used cooking utensils as far as I understand. Despite the contact with Macassans and Melanesians and Polynesians and probably others who did know the value of a pinch of nutmeg. Or a pot.

Incidentally I have had some of the longest conversations in my life chatting to central desert ladies about various vegetables. I'm talking days here Frank. Where the best ones grew. How to tell a good one. The worst one everyone ever found. Who can only ever find woody ones. The time Auntie Maisy found a whole uteful of 'em fellas right near the Katherine lock-up. One full day and a half organising and re-organising a trip out with the extended family to look for 'em ... for days on end it went ...Frank. They sing songs about their root vegetables Frank.

For folks who really seem to be culturally if not genetically challenged when it comes to cooking - only the Italians run a very lacklustre second compared to the locals when it comes to their obsession with food ... running meats in particular.

I will never have to learn a scientific name again.

3 months ago [report](http://theconversation.com/comments/187118/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Gail Carnes](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187112)

What makes knowledge 'traditional'? It smells a lot like dismissing that knowledge as second-rate or even not knowledge at all, but too coy to own up to what they really mean.

3 months ago [report](http://theconversation.com/comments/187121/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187074)

Oh Frank, I didn't think you were having a go. I was just being flippant about me and my fabulous omniscient "dominant culture". ;)

3 months ago [report](http://theconversation.com/comments/187131/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

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Farmer

In reply to [Gail Carnes](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187105)

I've spent a lot of my time looking at "sustainability" as a concept and I'm pretty sure it doesn't need the addition of farming to become an oxymoron.

Closest thing we've seen to anything "sustainable" long-term - is the locals I'd reckon. Pretty basic by our standards but given the name Manly in Sydney, seemed they had a healthy if spartan life. Not for me though. Or any of us I suspect.

Once you start burning stuff for a living - beyond patchburning and firestick farming - you run into…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Once you start burning stuff for a living - beyond patchburning and firestick farming - you run into trouble sustainability-wise. Before you know it you are eating Italian kiwifruit and selling your cattle into downtown Damascus.

"How do you reconcile the destruction of habitat with the need to feed the current inhabitants?"

Can't. Not on the scale we damage in order to do so... the resources, land, water, chemicals, energy, the full disaster ... We waste the land here. All my neighbours grow grass for a living... literally... they stick cattle on it and make money that way. It is a waste of good agricultural land. It could be feeding hundreds and employing them too.

But heck we put some of our best agricultural land under urban sprawl don't we? We still fill in swamps and tear out mangroves?

My only "solution" - is to see how much can be done with how little... by restricting the impact of food production to some 25% of the landscape and using the high yields to "subsidise" the stuff I'm leaving alone. So cultivating a small area intensively rather than a standard broadacre operation where one/s effort and capital are spread literally from horizon to horizon ... inevitably low to medium productivity. I'm after something like a patchwork if you like. Very diverse techniques - permaculture meets hydroponics. That make sense?

3 months ago [report](http://theconversation.com/comments/187145/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Gail Carnes](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187112)

Yes, indeed! And we are all part of the food chain - a fact which the crocodiles occasionally remind us, although in our cotton wool existence it can be easy to forget...

3 months ago [report](http://theconversation.com/comments/187189/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187087)

Practical ethology - an almost, but certainly not entirely, lost art...& worth hanging onto...

3 months ago [report](http://theconversation.com/comments/187193/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187118)

Examples abound: e.g, if I may quote from a book I've written:

"Clay’s efficacy as a means of adsorbing toxins meant that it was widely used as a cure for diarrhoea and other gastro-intestinal complaints. Clay also made it possible for Aboriginal people to eat a number of toxic Australian plants which would have otherwise been inedible, causing severe illness or even death, thus expanding the repertoire of available food on this continent and its surrounding islands.   
The role of clay in Indigenous…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Examples abound: e.g, if I may quote from a book I've written:

"Clay’s efficacy as a means of adsorbing toxins meant that it was widely used as a cure for diarrhoea and other gastro-intestinal complaints. Clay also made it possible for Aboriginal people to eat a number of toxic Australian plants which would have otherwise been inedible, causing severe illness or even death, thus expanding the repertoire of available food on this continent and its surrounding islands.   
The role of clay in Indigenous pharmacopeias is well documented. As Rowland writes, The practice of geophagy, in particular the consumption of clay and charcoal by humans, is global in its distribution, is of considerable antiquity and has a number of complex functions. One of these functions is the ability of clays...to adsorb toxins...This has been known anecdotally for some time and has more recently been scientifically demonstrated. [The]...evidence indicates that the adsorptive qualities of clays were well recognised by Indigenous Australians.   
The significance of such understanding of the medicinal properties of clay cannot be overestimated. Rowland concludes that: Western science often dismisses indigenous people’s knowledges and practices as tangential or irrelevant to the advance of Western knowledge. While such accumulated wisdom continues to inform medical practice, there remains a residual distrust of such knowledge...   
[...I]t is only in the last decade that [such knowledge, including the medicinal properties of clay] has been seen to have had a much more significant range of biophysical   
effects. It might now be considered as the most fundamental human plant-processing detoxification technique...Ghilardi et al (1999) and Diamond et al (1999) have confirmed the link between clay consumption and the adsorption of toxic plant substances.

There are a few references there, too...and the case of the Tiwi yam ceremonies come to mind.

Those of us around in the 1950s may also remember kao-magna... or it was called something like that - kao-magma - no, that sounds too volcanic, but the base ingredient was kaolin.

For the very few naysayers involved in this discussion, these are living traditions - as you've rightly said, Peter. Alive, and hanging on - but in some cases, only just...

3 months ago [report](http://theconversation.com/comments/187198/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187121)

I agree with you, David. I use it as a term of art, but am always tempted to put it in quotes. The other phrase that bothers me is "Western science" or "contemporary science." I think "traditional knowledge" is just as contemporary as "contemporary science". Thanks for bringing this up!

3 months ago [report](http://theconversation.com/comments/187812/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187145)

Thank you, Peter, for such a thoughtful reply. Your idea about patchworks makes perfect sense. I'm a big fan of permaculture and hydroponics, but don't know where they meet... Would be very interested in learning more!

3 months ago [report](http://theconversation.com/comments/187818/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187121)

"For folks who really seem to be culturally if not genetically challenged when it comes to cooking - only the Italians run a very lacklustre second compared to the locals when it comes to their obsession with food ... running meats in particular."

What a lovely experience.... thanks for sharing it!

3 months ago [report](http://theconversation.com/comments/187905/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Eva Cox**](http://theconversation.com/profiles/eva-cox-1012)

Professorial Fellow Jumbunna IHL at [University of Technology, Sydney](http://theconversation.com/institutions/university-of-technology-sydney)

There is so much valuable debate and information on this site that I'm stuck in trying to work out how it could be usefully disseminated and considered as part of re-framing the closing the gap issues this relates to: from an Indigenous deficit model, to one of working to close the mutual lack of understanding of different ways of seeing and explaining. This shift would make it easier for all of us to devise mutually informative educational programs and to learn other ways of seeing and describing based on mutual respect for the differences rather than assuming superiority and ignorance.

This shows up in areas like early literacies where Aboriginal parents are wary of programs that ignore different types of literacies their children may have, and assume their children are empty vessels to be filled.

It would be good to have a summary of the serious debates and ideas raised!!

3 months ago [report](http://theconversation.com/comments/186222/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Eva Cox](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186222)

Yes, I must agree. Despite my exasperation at times, the thread is hitting 200 posts, which end up coming at the issue from every corner possible. Yes, the thread would be the perfect material for a damn fine guide to the issues. Well done Christine!

3 months ago [report](http://theconversation.com/comments/186362/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Eva Cox](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_186222)

This is an excellent suggestion, and my reason for not answering immediately is that I've been thinking about possible courses of action leading on from this very broad discussion, with the key point (as you've put it so well) being to work together on creating "mutually informative educational programs and to learn other ways of seeing and describing based on mutual respect for the differences rather than assuming superiority and ignorance."

You are also quite right about the question of literacy…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

This is an excellent suggestion, and my reason for not answering immediately is that I've been thinking about possible courses of action leading on from this very broad discussion, with the key point (as you've put it so well) being to work together on creating "mutually informative educational programs and to learn other ways of seeing and describing based on mutual respect for the differences rather than assuming superiority and ignorance."

You are also quite right about the question of literacy in Indigenous communities and schools, with the most obvious injustice being the closure of the bilingual education programs in the Northern Territory, despite the fact that these were programs which were strongly supported by 99% of the children's families. The case of Yuendumu Schools has already been raised by one respondent here, but of course there are many more, too.

I think that I need to be the person to put my hand up for the summary, although it may take me several days given my other work commitments. And another thing - perhaps we should work towards establishing a loose consortium of interested parties, committed to the mutually respectful approach that you're advocating...

And a final point \_there have been many really good comments here, which as you say need to be collated and used as a basis for future thinking/action, but I've also noticed that the vast majority of commenters have been men - for which I'm grateful - but I'm wondering why so relatively few women, especially when there ar more women teachers than men? Is it the old maths + science vs. arts divide? Perhaps some of the discussion could be specifically directed to hearing more women's voices...that may be something else to follow up...

3 months ago [report](http://theconversation.com/comments/186369/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Adele Pring**](http://theconversation.com/profiles/adele-pring-99067)

Educator

Thanks Christine for your article on Aussie Rules and Aboriginal Maths   
What a great way to educate football followers about Aboriginal culture.   
I forwarded it to some colleagues in the education department and they're forwarding it.   
I referred to the Harris quote some years ago in some advice for teachers about Aboriginal people and mathematics and in a paper I called ‘Astronomy and Australian Indigenous People’. Some extracts follow.   
Warm regards,   
Adele Pring   
FINDING DIRECTIONS DURING THE…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Warm regards,   
Adele Pring   
FINDING DIRECTIONS DURING THE DAY AND NIGHT

A survival skill   
Larry Higgins, Aboriginal man from Port Lincoln says "When you go fishing, for your life and safety it’s important not only to learn to read maps and charts but also the stars. Before technology came along the old people learnt to navigate by the stars. If you’re not in sight of the land and you haven’t got access to satellite navigation (GPS Global Positioning System) or a compass, both of which can break down, you should make sure you can rely on finding directions from the stars.

I learnt it from Grandfather Hirschausen when I was a child. We grew up at the family farm at Poonindie just north of Port Lincoln, SA. Later on I was working as a fisherman over our way around Port Lincoln and I would use my knowledge to line up the Southern Cross and Pointers to find south. You could also tell west from the evening star (Venus) because it’s the first star you see at night if it’s in the sky. If you saw it in the morning it would be in the east.

If I had the chance over again I’d listen to what my grandfather was trying to say to us in terms of safety at sea instead of just day dreaming and taking things for granted." (personal communication 1990s)

Finding directions during the day   
Aboriginal people living in the (apparently) featureless desert landscape in parts of Central Australia were asked how they knew their way without compasses.

They were asked if it was the path of the sun, the night sky or something else and they replied that they just knew in their heads. When asked by a teacher what they did when they got lost they had trouble understanding the question but finally replied ‘We go home!’

Dr David Lewis who researched direction finding with groups in Central Australia says ‘All my reconceived ideas about ‘land navigation’ turned out to be wrong. In place of the stars, sun, winds and waves that guide Pacific Island canoemen, the references of the Aborigines proved to be the meandering tracks of the ancestral Dreamtime beings that form a network over the whole Western Desert. In pointing out the direction of far-away sacred sites the error was never more than 10 per cent and, in fact, averaged 2.8 degrees. The place was ‘featureless and flat, with moderately open mulga and spear grass, devoid of sand hills, creek beds, escarpments, tall trees or other references. Visibility through the evenly-spaced mulga was a hundred metres at most.’

‘A kangaroo, wounded by a bullet, was hunted on foot for half an hour. After it was killed, Jeffrey and Yapa headed without hesitation directly back towards the Landrover, that had been invisible since the first minutes of the chase.   
Q. ‘How do you know we are heading straight towards the Landrover?   
A. ‘Jeffrey taps his forehead. ‘Malu (kangaroo) swing round this way, then this’, indivating with sweeps of his arm. ‘We take short cut.’   
Q. ‘Are you using the sun?’   
A. ‘No.’

The Landrover duly appeared ahead through the mulga in about a quarter of an hour. Jeffrey then repeated his explanation, illustrating by gestures and by drawing in the sand the malu’s track and our own ‘short cut’ home.

Had Jeffrey any points of reference? The only external one was the starting point, and the sun was not consulted. He was not using the ‘points of the compass’ (which could have been located from the sun) nor, in this case, did sacred sites come into the picture. It would appear that Jeffrey was orienting on some kind of dynamic ‘mental map’, which was continually being up-dated in terms of time, distance and bearing, and more radically realigned at teach major change of direction, so that the hunters remained at all times aware of the precise direction of their starting point.

Very young children in this area are trained to learn their people's names for cardinal points. Instances have been noted of toddlers, too young to speak, demonstrating their knowledge by looking in particular directions (to cardinal points) when instructed. There are of course different names for directions according to the different language groups.

Gavan Breen researched direction names amongst many Aboriginal groups didn’t find absolute answers but thinks that names for cardinal points might be based on the prevailing winds, sand ridges and/or main direction of rivers. His theories try to explain why there was a 90° shift in Alyawarr names for cardinal points when Alyawarr people migrated from one area to another.

It is possible that knowledge of directions is learnt at such a young age that people cannot articulate how they know. In the daytime, it is quite likely a combination of knowledge factors including:   
• path of the sun   
• prevailing winds   
• features in the landscape such as hills   
• changes to tracks by wind   
• colour of bark of north of tree trunks compared to south   
• position of flowers on a plant.

In some areas, Aboriginal people were buried in positions facing east. In the Flinders Ranges, the Adnyamathanha people built a semi-circular wind break around the head (south) end of graves to provide protection from the south wind.

A woman in a clinic in Central Australia is asked by the doctor which leg hurts as she replies "My 'west' leg". The use of cardinal points is practised continually in this way, reinforcing the knowledge. Compare this to 'left' and 'right'.

Mathematics in a cultural context: Aboriginal perspectives on space, time and money, Pam Harris, Deakin University, Geelong, Vic 1991 is an excellent book for background reading about traditional Aboriginal concepts as they relate specifically to teaching about space, time and money.

In 1977 Judith Kearins (in Harris, P. 1991 p. 34) conducted spatial judgments experiments with 10-12 year old Aboriginal children and children of European descent at Meekatharra and found that the Aboriginal children’s mean performances were superior in most tasks but clearly superior in a mapping activity. The children were shown on a map the position of the school, the creek and the railway station, and they were then asked to say where they lived. Kearins reports:

...the time taken by Aboriginal children to find the position of their own homes was about half that taken by the European descent children, and the behaviour of the two groups was, for the most part, strikingly different ... Aboriginal children looked carefully and either moved a finger from the school to their home in a direct line, or simply put a finger on the place. White children in almost all cases (there were three exceptions) followed streets carefully with a finger, turning all corners ... as they might walk. ... Kearins also tried it informally with younger (year 2) Aboriginal children and found that they were ‘quite at ease with the maps, and both quick and surprisingly accurate at finding their homes’.

Student activity   
Students could practice referring to cardinal points instead of left and right, for example, my east hand or my south west foot or the north whiteboard.

Observe nature in the school yard to try to work out signs for directions using some of the factors above.

Using the Milky Way, Southern Cross and other stars to find directions at night   
Particular stars and constellations are linked to Dreaming stories which themselves are used for direction finding.

The video Inside story: the human race shows Jack, an Aboriginal man in his 70s in a 500 km walking race against younger men in northern WA. Jack chooses to walk at night with the stars as his guide. An excellent video to show Jack's cleverness and knowledge of his country and the night sky. His home country is near the Great Sandy Desert and the Bungle Bungles in the Kimberley region in northern Western Australia.

In very hot environments it makes sense to walk longer distances during the night rather than the day to prevent dehydration and exposure.

Barney Lindsay, a Ngarrindjeri man from the Riverland in South Australia said in personal communication "In summer the Milky Way goes from this way (south) across here (to the north) but in winter it’s across the other way (east, west)."

Leroy Richards, an Adnyamathanha / Wailpi man from the Wilpena Pound area in the Flinders Ranges in South Australia said in personal communication ‘When I was working as a stockman all around the north, Frome Downs, Innaminka, Gidgealpa, Balcanoona, we would drive the cattle or sheep at night when it was hot. This is called moonlighting the stock. The non-Aboriginal stockmen would say “We have to head off this way”. I’d say “You go that way if you want but I’m going this way”. I would go and soon I’d hear them following. I never once got lost. We grew up knowing the country and the sky. I’m forgetting now I sleep under a roof.”

Using the Southern Cross for telling the time

Evelyn Crawford in her autobiography Over my tracks, Penguin 1993, used the Southern Cross for telling the time when working in cattle camps as a drover. ‘You’d say ...”Wake me up when the Cross turns over ... Wake me when the tail’s this way ... or that way ... or when the bright star’s over ‘ere...” and you’d draw it on the ground. You could tell every two hours by it.

We learnt to identify all the stars by their Aboriginal names. They had meaning for us, and there were stories about them all. I learnt the white man’s names later.’

Guy Deutscher, in Through the language glass: why the world looks different in other languages, Picador, NY 2010, affirms the geocentric personal position in space (using directions) rather than egocentric (left/right) of the Guugu Yimithirr people of northern Queensland. He describes an example on p 167 of a speaker of the language reading a book facing north, saying ‘go further east’ (to flip forward).

Student activity   
Make a model of the Southern Cross and Pointers to show how their position changes during the night as well as how they are low in the south sky during summer and high during winter.

Use a star chart to plot how you would see the Southern Cross and Pointers at two hour intervals on the night of your birthday. Indicate south on each drawing by use of lines and an S. Compare the angles to those on a clock.

3 months ago [report](http://theconversation.com/comments/187454/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Adele Pring](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187454)

Hello Adele,

Thank you so much for this detailed and information rich posting, which is important in this discussion in many ways, not least because it's an outcome of your own long-term successful background as an educator in the field, and shows that educators have been aware of the significance of such knowledge for quite some time, and how it's imperative that such knowledge become part of the national curricula in both science and mathematics - there's a real opportunity there to right some…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Hello Adele,

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Related to this, I can see that your post has already generated a good deal more discussion about the educational implications of my original article, which is great, because my overarching objective in writing this was to draw attention to the potential educational applications of such knowledge.

What you've outlined here is also a useful complement to Duane Hamacher's terrific article (also on The Conversation: "A shark in the stars: astronomy and culture in the Torres Strait") which you and others may wish to check out. And perhaps most of all, I can see the importance of continuing this debate along with others post- this particular discussion on The Conversation, as Eva has so wisely suggested, with a view to influencing (and in some cases, educating) educational authorities in all Australians states.

So thank you!

3 months ago [report](http://theconversation.com/comments/187684/abuses/new)

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[**Warren Beckwith**](http://theconversation.com/profiles/warren-beckwith-99076)

Mathematics Teacher

Thank you for the article Christine. I'm a Maths teacher from Perth and a passionate AFL fan (I have umpired the game for many years). I have tried to incoroporate Australian Football into my lessons, when appropriate.   
Obviously there are some simple examples, such players' statistics (heights, game stats etc), or the scoring system and the patterns that arise from this. Another significant aspect of the game is that players must make quick decisions. If they have possession of the ball, they must…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Obviously there are some simple examples, such players' statistics (heights, game stats etc), or the scoring system and the patterns that arise from this. Another significant aspect of the game is that players must make quick decisions. If they have possession of the ball, they must consider their options quickly and decide on the best path to their team's goal. Players who have a greater awareness are highly sought after by clubs. Often passing will be instinctive, to take themselves out of a pressure situation, but many times they will have choices to make and must do so when trying to work within their team plan.   
(Sometimes they may be unsuccessful - as Dennis Commetti would say. "They have chosen the third of two options".)   
Coaches will often speak about "playing the percentages". In other words, play the safest option and avoid the heroics. At other times, when time is an enemy, commentators will say, "Its time to roll the dice". (i.e. Risks must be taken.)   
Estimating probabilities in such situations can be fun for simple discussions, and can be translated to other aspects fo life.   
Tools, such as the AFL, are good examples of how to engage students who may otherwise find little meaning in Maths.

3 months ago [report](http://theconversation.com/comments/187503/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Warren Beckwith](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187503)

Many thanks for this interesting post, Warren - the perspective of maths teachers currently working in classrooms around Australia is obviously incredibly important in relation to the current discussion, and it's great to hear of teachers' often very creative initiatives to engage kids in the classroom. I imagine that applications this approach would be very successful, both for Indigenous and non-Indigenous kids - especially boys.

3 months ago [report](http://theconversation.com/comments/187691/abuses/new)

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[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

I'm reading a book called "Brainsex" by Moir & Jessel which explores the differences b/w the sexes. Admittedly it was published in 1992 so it would be interesting to know if the data/information is still relevant.   
  
The book quotes a study by Stanley and Benbow that says in regard to mathematical excellence the beast boys eclipse the best girls by 13:1.

It also states that boys have superior eye-hand co-ordination necessary for ball sports.

3 months ago [report](http://theconversation.com/comments/187529/abuses/new)

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Farmer

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187529)

I'd be taking those stats with a toxic load of salt Stephen ... check under the hood and see where the sample comes from...

Over the last decade I have become an avid TV netball watcher. Tell any of those women their hand-eye co-ordination is wobbly... then duck ... really quickly. Revolutionised the game Australia has.

I know these women would be "outliers" - exceptions that prove the rule... or, when we are looking at such numbers of educational "achievement" are we really looking at…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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I know these women would be "outliers" - exceptions that prove the rule... or, when we are looking at such numbers of educational "achievement" are we really looking at how we teach and what we examine in particular?

There is a wealth of valid criticism of notions of "IQ" for example and the inherent emphases and cultural loadings built into such assessments.

It would be interesting to see what sort of tests or activities (beyond footie) pick up these spatial/directional bearings of aboriginal students ... if it becomes evident in other fields of study - or can be made so.

I don't know who these "beast boys" are Stephen but I would be wanting some sort of extraordinarily solid proof for such an extraordinary claim. 13:1 ... seems we'd notice such a crushing level of dominance. I shall check - be warned.

But it is true that women apparently use different cues to navigate and locate themselves in the landscape. This is why so many efforts at husbands using the street directory lead directly to murder trials. The courts are clogged with them.

3 months ago [report](http://theconversation.com/comments/187540/abuses/new)

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[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187540)

Ironically Peter the book also went on to say that b/c of superior spatial cues, men are better map readers.

Dr Camilla Benbow & Dr Julian Stanley - google them.

3 months ago [report](http://theconversation.com/comments/187543/abuses/new)

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Farmer

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187543)

I shall indeed Stephen ... then I'll get a fatwah on 'em!

3 months ago [report](http://theconversation.com/comments/187566/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187543)

Stephen, sex differences in spatial ability are well established, especially at the extremes, which is why you find relatively so few women Mathematicians, let alone Theoretical Physicists.

3 months ago [report](http://theconversation.com/comments/187610/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Katherine Ingram**](http://theconversation.com/profiles/katherine-ingram-99090)

ESL teacher

Thanks Christine for fascinating insights into AFL skills and intensely different world views. Having grown up in a football-mad household (and therefore joining the Anti-Football League) I have only recently come around to considering what makes Australian Rules unique. I now know another little gem.   
But I have long been thinking about what knowledge we miss out on when language dies. I think your original article pointed to a very precise example. Nicholas Evans’ ‘Dying Languages’ 2010…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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But I have long been thinking about what knowledge we miss out on when language dies. I think your original article pointed to a very precise example. Nicholas Evans’ ‘Dying Languages’ 2010, in many ways a heart-breaking book, makes the point that ‘on best current estimates, every two weeks, somewhere in the world, the last speaker of a fading language dies’.

It seems to me that the dominant culture is voracious, and doesn’t allow for the validation and inclusion of other epistemologies.

To imagine myself into the situation of losing my language, I have wondered about being forced to learn Japanese from birth and punished for using English, had circumstances been different in the 1940s. Doubtless I would have learnt interesting Japanese language and literature but for the rich English poetry canon, with my father spouting long Shakespearean speeches, to have been lost to me doesn’t bear thinking about. I can feel real grief just thinking about it and yet that’s only one facet of the language.

Many researchers have written of the intellectual benefits of bilingualism. Why do we allow our Indigenous languages to die when there would be so many benefits to students educationally if fluency were encouraged right through school? Continuing to develop one’s mother tongue doesn’t preclude learning English.

3 months ago [report](http://theconversation.com/comments/187597/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Katherine Ingram](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187597)

This from a transcript (4th.April 2012-Alice Springs)- The Parliamentary Inquiry into Language Learning in Indigenous Communities:   
A Warlpiri man (here not identified for privacy reasons):   
"I grew up in Yuendumu, learning both in Warlpiri and English. I work in the language centre in Yuendumu, and my main work is translating and recording stories for new books. I have brought some of them here for you to maybe check out later. They are in language. When I was growing up, since I was in preschool…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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"I grew up in Yuendumu, learning both in Warlpiri and English. I work in the language centre in Yuendumu, and my main work is translating and recording stories for new books. I have brought some of them here for you to maybe check out later. They are in language. When I was growing up, since I was in preschool, there were two teachers, a European and a Yapa—an Aboriginal—and they both helped, in my opinion, in my education. I think Warlpiri language is a vehicle to move me further towards where I need to go, even in learning different languages such as English. Language keeps me grounded, it gives me identity and a sense of belonging, because I know where I stand, and it gives me a strong sense of pride."

I had the opportunity to pick up the English language as I was growing up in the school. I learned both ways, English and Warlpiri. I can read and write in both English and Warlpiri both, so it helps me to learn both ways, to fit into both cultures, English and Warlpiri. I think it helps. I think it is important, especially in younger children because they soak up knowledge very quickly. Especially when they have English coming in and they do not know much about this new language, they have to be slowly fed knowledge. I think the Warlpiri language is the way to help them learn about with English—using both as a way of gaining knowledge, growing up strong and grounded. It helps them get to where they want to go in life. So I think it is important that we keep both languages. That is what we had when I was growing up in Yuendumu".   
And this from me:   
"If I may indulge myself, I would like to give you a hypothetical example. It goes like this: just imagine that in the Second World War the Japanese had won. There is a little school of Australian English-speaking children in western Victoria, in Casterton, and the Japanese have taken over the education system. In walks Matsumoto-san. He has got all these little children lined up on their first day of school. They have been hunted to school because if they do not go, their parents are going to lose their entitlements to Centrelink. So then this guy walks in and says [Japanese language not transcribed].\*\* These little children have not got a clue what he said and all he said was, 'My name is Matsumoto.' Then he proceeds to give them a lesson in phonics—reading and writing. Those kids are going to go home at night and their mothers and fathers are going to say, 'How did you go at school today?' They are going to say, 'Not all that crash hot. We didn't have a clue what the teacher was saying.'   
\*\* Kon nichi wa, watashi-no namae Matsumoto desu ....

Why do we allow our Indigenous languages to die....? Indeed Katherine, why do we?   
Next year I'm told Yuendumu School is getting a full time truancy officer.   
Am I wrong in suggesting the money would be better spent on a full time linguist?

3 months ago [report](http://theconversation.com/comments/187655/abuses/new)

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[**Katherine Ingram**](http://theconversation.com/profiles/katherine-ingram-99090)

ESL teacher

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187655)

I enjoyed that little cross cultural indulgence Frank - similar to my own occasional fantasy about language loss, which of course is very difficult for native English speakers to get their heads around.

The enforcement mentality vs the facilitative mentality - what a waste of an opportunity. Why do we not listen to the people like the Warlpiri man you have quoted, and do what works? There's so much evidence about best practice and what works in successful education systems. But we seem to have a special talent of ignoring all that and going for the mediocre. Our slipping down the ranks of international education outcomes shows that clearly enough.

3 months ago [report](http://theconversation.com/comments/187670/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Katherine Ingram](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187597)

Katherine - your eloquent 'what if' scenario really spells out the reality of the situation today with many Aboriginal children in places where Aboriginal languages are still spoken as the community's first language who, like other Australian kids, enter school (mostly) unable to read and write but are beset from day one with an even greater obstacle to real learning - of not being able to use the strongest string to a young child's bow - their own language skills. And worse still, having that linguistic skill regarded as an encumbrance to their learning...

It is difficult enough for many 'mainstream' children starting school to master reading and writing, and as we know, many don't, but imagine the triple jeopardy situation of also having to start learning a new language on your first day of school...that is a recipe for failure except for the few brilliant kids who will cope...

3 months ago [report](http://theconversation.com/comments/187704/abuses/new)

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Farmer

In reply to [Katherine Ingram](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187670)

Do not despair Ms I - place not your faith in glib statistics.

What are they measuring these global educational comparators? What skills and capacities are identified and weighted? More important - which "educational outcomes" are ignored? What's more educationally significant - 12 times tables or learning how to protect you little sister? Does enthusiasm count? Curiosity? How about character? How about a 12 year old with 7 languages under his belt? An insatiable appetite for reading? Chess…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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I know I should try and be more utilitarian in my global outlook... not Eastern Greys - running meats! Not people - job applicants!

But I think we must be very careful lest we adopt too narrow a definition of skoolin - as this set must be. We need a set of education outcomes that pay heed to context and are designed to equip kids for life and the real options they confront. What is a good outcome here and now? What is a priority? Does lack of electricity at home count? What does this kid actually need?

I reckon the assumptions and statistical manipulations involved in such league tables of comparable educational outcomes spanning cultures, economies, towns and cities, continents, deserts and concrete jungles would be gold medal contenders for the gymnastics. Economics is knee-deep in dodgy numbers - gets so you can smell 'em.

3 months ago [report](http://theconversation.com/comments/187705/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187705)

Peter, they are measuring the skills, knowledge, and aptitudes needed to thrive in a modern, post/industrial, polyglot world of 5 billion plus. They are not measuring the skills, knowledge, and aptitudes that might have been important to thrive in a pre-agriculture world of bands of a few hundred people or so.

3 months ago [report](http://theconversation.com/comments/187718/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187705)

"learning how to protect you little sister" is not the job of school teachers. It is the job of the family and community. All this passion for turning children over the functionaries of the State is offensive. And scary.

3 months ago [report](http://theconversation.com/comments/187721/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Katherine Ingram**](http://theconversation.com/profiles/katherine-ingram-99090)

ESL teacher

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187705)

Peter, I'm interested to know what you think about a full-time truancy officer versus a full-time linguist at Yuendumu?

3 months ago [report](http://theconversation.com/comments/187740/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

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Farmer

In reply to [Katherine Ingram](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187740)

Can this truancy officer speak a few useful languages then?

Depends what a truancy officer does really. And maybe what a linguist does too. Either or both could be useful - or neither.

One looks to some sort of future - one is some sort of insurance for the past. Don't have problems with either.

If they contribute to building and strengthening the local community - leave something useful and lasting - then they've helped. And that can come from a copper, a school teacher, a road worker, a half-decent boss or even a half decent cook. Anything that gets people talking and working together ...

3 months ago [report](http://theconversation.com/comments/187763/abuses/new)

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[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

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Farmer

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187718)

Thrive??? Wot - like Rupert Murdoch? Not quite that thriving? So what does thriving look like ... being part of a functioning community for a start. Having opportunities available and knowing how to take them on.

But given the sort of market around some of the great Aboriginal painters, I'd be most wary of lecturing folks about what is needed to thrive... what the hell would we know?

Not everyone wants to be an accountant. For some the best "career opportunities" they'll be able to get…

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Thrive??? Wot - like Rupert Murdoch? Not quite that thriving? So what does thriving look like ... being part of a functioning community for a start. Having opportunities available and knowing how to take them on.

But given the sort of market around some of the great Aboriginal painters, I'd be most wary of lecturing folks about what is needed to thrive... what the hell would we know?

Not everyone wants to be an accountant. For some the best "career opportunities" they'll be able to get without moving to the big city - involve short hours casual shift-work ... supermarkets, contracting, cleaning, domestic stuff at the pub, or if they're really lucky, the local council.

The point is David, that can be thriving. In the right place and time. Indeed if the local cemetery here in Woolibuddha is a guide, once one survives 25, such a life of limited career opportunities combined with fresh country air seems a recipe for a hefty lifespan and long marriages.

Educated people tend to find jobs David. But not if one is educated for jobs imagined by panels of unimaginative curriculum prognosticators. They become curriculum consultants.

You'd be amazed how people make a living in rural Australia - I know I am regularly. And a great part of it relies on dealings and character ... ethics and business skills... being connected and reliable... nothing taught at school or measured in

All depends on what one's sense of thriving might be. Where one thinks such things are learned if not taught. Things necessary to thrive in a small pond.

3 months ago [report](http://theconversation.com/comments/187765/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187765)

Peter, don't tell me. Tell the OECD Education types.

3 months ago [report](http://theconversation.com/comments/187775/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187763)

The mooted truancy officer is part of a multi-million ($95M from memory) "improved attendance" initiative announced by Ministers Macklin and Garrett as part of the euphemistically named Stronger Futures- The Intervention Mark II.   
Apart from the gratuitous punitive aspects of this initiative (a threat to withhold Family Assistance Benefits if children don't attend school), the flaw as I see it is that improving attendance is futile if the children don't learn anything. This is particularly so for…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Apart from the gratuitous punitive aspects of this initiative (a threat to withhold Family Assistance Benefits if children don't attend school), the flaw as I see it is that improving attendance is futile if the children don't learn anything. This is particularly so for very young children that don't understand what their teacher (that effectively speaks a foreign tongue) is saying. By the time Warlpiri children have picked up enough English to begin to know what the teacher is teaching them, their intellectual and scholastic development is several years behind, and only the brightest ones will ever catch up.   
A linguist on the other hand has studied the essence of languages and learning. Yuendumu used to have a fulltime qualified linguist employed at the school. The linguists proved invaluable to the execution and design of the bilingual programme as well as 'mentoring' the teaching staff (white and Warlpiri) to be more effective. I'm sure most people taking part in this discussion know the difference between a linguist and someone that is multilingual, but you'd be surprised how much general ignorance prevails even amongst highly placed bureaucrats that hold the future of children's education in their hands.   
Peter, I like your ironic question as to whether the truancy officer is multilingual. One might also ask does he speak with forked tongue, or does he keep his tongue firmly in his cheek.   
I'm not so sure about your some sort of future and past distinction though.

As an analogy I think of a Linguist in a bilingual school as being an Architect.   
An architect can't necessarily mix concrete or tile a roof, but a good one can sure design a great building that has a solid foundation and doesn't fall down.

My thinking is that first you deal with making the school worth attending. Subsequent to this you turn your attention to attendance per se.   
When you build a building you don't start with the roof.

3 months ago [report](http://theconversation.com/comments/187797/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187797)

A great - and important - contribution to the debate Frank.

In further response to Katherine's succinctly phrased question "about [whether or not there should be] a full-time truancy officer [or] a full-time linguist at Yuendumu", apart from your entirely valid point about the likely alienation of little children from day one of their schooling when that schooling is conducted in what is essentially a foreign language to them (and let's remember, these are little kids in their own 'country…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

A great - and important - contribution to the debate Frank.

In further response to Katherine's succinctly phrased question "about [whether or not there should be] a full-time truancy officer [or] a full-time linguist at Yuendumu", apart from your entirely valid point about the likely alienation of little children from day one of their schooling when that schooling is conducted in what is essentially a foreign language to them (and let's remember, these are little kids in their own 'country'), there's another point to be made:

if there is a linguist employed in the school then there's a lot less likelihood of needing any truancy officer. At the height of the Warlpiri/English bilingual education program at Lajamanu in the late 1980s, the school's attendance hovered around 95%, because there were Warlpiri teachers in most classrooms and the kids actually wanted to be there...

I also wonder whether the mooted Truancy Officer is going to be a respected Warlpiri person or some 'greenhorn' from 'down south'? If the latter, the $$$ spent on this will be wasted...once more...

3 months ago [report](http://theconversation.com/comments/187850/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187850)

Christine, given there is an actual real Warlpiri woman in the current NT Parliament (in government too, not opposition) - born/bred/speaks Warlpiri - shouldn't these issues be able to be resolved, rather than getting bogged down in the largely whitefella world of the Aboriginal Industry bureaucracy?

3 months ago [report](http://theconversation.com/comments/188021/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188021)

Ohhh David - of course I know that. Bess Price Nungarrayi is someone I first met over 30 years ago and I know her to be a good woman doing a difficult job. I also know most of her family members, some very well indeed - and in some cases (the older family members) I've known them for 30+ years, too.

However, I'm afraid that your assumption in this post is fatally flawed: Bess Price Nungarrayi, part of the Territory's CLP government, does not speak for ALL Warlpiri people any more than you speak…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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However, I'm afraid that your assumption in this post is fatally flawed: Bess Price Nungarrayi, part of the Territory's CLP government, does not speak for ALL Warlpiri people any more than you speak for all non-Indigenous Australian people (or anyone else does for that matter, including myself, of course). And in the same way, I don't think that you would agree that your local MP necessarily speaks for you, either...I'm sure that you would have some reservations.

All of the Warlpiri people quoted or cited in this article are 'real' people (including the 18 month old baby who must be about 30 years old now!) so it's not as if you don't already have access to some of those perspectives already.

It is naive to expect that all of the issues in this discussion could be 'resolved' by any one individual.

3 months ago [report](http://theconversation.com/comments/188051/abuses/new)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188051)

Aw heck Christine - we've even got one in parliament now ... what more could they possibly want??? You want a go at Prime Minister next turn?

I recall that we've recently had an atheist running the show for us and I've been sitting here for almost 1,000 days waiting eagerly for an outpouring of godless legislative reforms and edicts with very little joy. When will we heathens get the calibre of political representation we deserve???

Where are all these simple answers we know are plain as the nose on your face? Why do we have to worry about this sort of thing now that there's a real one in parliament?

Truly that is a very strange thing to say David.

3 months ago [report](http://theconversation.com/comments/188073/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Katherine Ingram**](http://theconversation.com/profiles/katherine-ingram-99090)

ESL teacher

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187797)

Great analogy. Schools worth attending and worthwhile experiences at them and maybe no-one needs old-fashioned truancy officers.

3 months ago [report](http://theconversation.com/comments/188180/abuses/new)

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Farmer

In reply to [Katherine Ingram](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188180)

Takes a fair bit of "worthwhile experience" to compete with bush honey and water holes on a hot day... even for the teachers I'd reckon.

3 months ago [report](http://theconversation.com/comments/188182/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Katherine Ingram**](http://theconversation.com/profiles/katherine-ingram-99090)

ESL teacher

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_187797)

Frank - I think it was you who told about children learning to write the letter N as a termite mound with a digging stick?? I've been thinking about the skill involved in producing the mirror image when reoriented in the opposite direction. I guess in most cases those children would've been corrected, made to feel they'd made a mistake and thus what Chris Sarra refers to as the 'toxicity of low expectations' becomes more firmly entrenched. The dominant culture has a very limited if powerful world view and it's a great shame we do not address this in our education systems.

3 months ago [report](http://theconversation.com/comments/188183/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Katherine Ingram](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188183)

The anecdote of the letter N refers to a period in time when "toxicity of low expectations' didn't apply.   
It was at the height of the much maligned self-determination policy. Most Warlpiri school pupils were subjected to 'team teaching'. A Warlpiri teacher and a non-Warlpiri one working as a team each bringing different skills and knowledge that resulted in effective teaching in a cross-cultural setting.   
The Warlpiri teacher contributed an ability to communicate with the students and his or her…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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The Warlpiri teacher contributed an ability to communicate with the students and his or her Warlpiri world-view, the non-Warlpiri teacher contributed his or her training and experience as a teacher, and such planning, curriculum development and teaching ESL.   
Don't get me wrong, bilingual education at Yuendumu school wasn't always perfect. It was almost continuously subjected to bureaucratic and political sabotage and under resourcing. The high mobility of Warlpiri families also didn't make matters easy for the teaching staff. New white staff didn't always embrace the Warlpiri-English equal status idea, and on occasions would poison the relationship with dominant culture ethnocentric assimilationist attitudes and relegate their Warlpiri colleagues to being glorified blackboard cleaners. The 'toxicity of low expectations' in action.   
What is highly unfair in the current socio-political environment is that failures in education (perceived-as a result of meaningless NAPLAN testing, or real as a result of inadequate teaching methods and high rates of truancy or irregular attendance) are often used to negate the validity of bilingual education. This is truly a case of throwing the baby out with the bath water.

3 months ago [report](http://theconversation.com/comments/188252/abuses/new)

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Farmer

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188252)

Spot on Frank.

3 months ago [report](http://theconversation.com/comments/188270/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Katherine Ingram**](http://theconversation.com/profiles/katherine-ingram-99090)

ESL teacher

This is off on a tangent, but I wonder if anyone can tell me what the current status of bilingual education in NT is? I've made a couple of inquiries through official channels but been stonewalled.

3 months ago [report](http://theconversation.com/comments/188184/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Katherine Ingram](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188184)

Katherine, I'm sure if you put a call into the MP for Sturt - Bess Price - her office would gladly assist. I'm sure an email would be just as effective.

3 months ago [report](http://theconversation.com/comments/188223/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Katherine Ingram](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188184)

I don't think that this is off-topic at all - what we're discovering via this extensive discussion is that there is a whole bunch of interrelated ideas/issues that are brought into play in this field.

My feeling is that you should approach your OWN local federal MP, especially as an election looms, and ask them to find out the answer to your significant question. This will be a particularly efficacious approach if you are living in a cliff-hanger electorate - of course.

There is also an organisation called 'Friends of Bilingual Education', and perhaps one of their members will know the answer to this question & post it up on to this site.

3 months ago [report](http://theconversation.com/comments/188280/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Katherine Ingram](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188184)

I'll digress first and then answer your question as best I can. To the extent that I tell you things you already know, it isn't my intention to "teach you how to suck eggs"   
The "4 hours English only" policy (4EOP) a few years ago effectively closed down the few remaining bilingual programs in the NT that had survived a decade of attrition. There are rumoured to be one or two schools that didn't throw in the towel, but I think if so they are better off remaining under the radar. When 4EOP was first…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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The 'toxicity of low expectations' has truly set in, and not just in Education but in everything. Warlpiri people are less than ever since 1967 in control of their own lives. Remote community social fabric has been seriously damaged, and Warlpiri people thoroughly disempowered, a process accelerated by the Intervention. The Intervention and its clones (Closing the Gap and Stronger Futures) are supported by a highly effective Spin and Propaganda machine.   
High officials in Education come out with statements such as "They can learn Warlpiri at home"   
"They have to learn English if they are have to have a future" and (this from the Director of Education himself) "English is the language of learning, it is the language of living" (I'm not kidding, he really did say that).   
Whenever I bemoan the non return of bilingual education at Yuendumu School Council meetings, I am told "but we do have two-way education". What is being referred to are efforts (with some success) at employing more locals to work at the school, posters and Warlpiri words being put up on classroom walls and the one hour sessions (rotated throughout the school) of Warlpiri literacy in the "Warlpiri Room". The school has two remaining qualified Warlpiri teachers.   
New staff mostly have no idea of what is possible, nor are the powers that be inclined to tell school principals to implement a bilingual policy. The difference between 'teaching in the vernacular' and token biculturalism is not well understood.   
The short answer to your question: (true effective) bilingual educations currently has no status whatsoever.

3 months ago [report](http://theconversation.com/comments/188294/abuses/new)

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Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188294)

Thanks for that detailed explication Frank.

I still reckon it would be worthwhile for people like Katherine, Sally (who's just recently posted) and others to put the same question to their local members, asking them to find out from the NT Govt./N.T. Education Department what the "official" government line is on bilingual education at present, especially in the lead-up to the election, during which time people may expect to receive quicker-than-usual answers.

3 months ago [report](http://theconversation.com/comments/188310/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188310)

Christine, it is very telling that you are so keen to fob this issue away from an actual Warlpiri woman in power in the NT (the very people who run the education system remember). It just smells yet again of the gubba-run Aboriginal Industry wanting to control all flows of information about these issues.

3 months ago [report](http://theconversation.com/comments/188470/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Sally Baker**](http://theconversation.com/profiles/sally-baker-98314)

Artist

“Too right” the Australian Curriculum can foreground independent existence and coexistence of Indigenous Knowledge Systems, - with new systems of teaching and planning for learning. Australians can expect teachers to develop a national community of practice across the country, skillfully embedding Indigenous Australian knowledge and practices into the Australian national curriculum. The teams’ consciousness’s are drafted through The Australian National Professional Standards for Teachers, comprised…

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3 months ago [report](http://theconversation.com/comments/188244/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

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Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Sally Baker](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188244)

Sally, many thanks for your comments here.

Do you, or anyone else reading this, know how do classroom teachers living a long way away from metropolitan areas or so-called 'ordinary people' (eg parents, Indigenous and/or non-Indigenous) who might want to influence the curriculum, are able to become involved in this process? Can they contact project teams directly?

I know that AITSL has a website, with Illustrations of Practice, and Pilots and so forth that people may access if they wish, but beyond that, how can others provide input in the way you suggest, if they wish to assist the process of embedding Indigenous Australian knowledge and practices into the Australian national curriculum?

3 months ago [report](http://theconversation.com/comments/188450/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Sally Baker**](http://theconversation.com/profiles/sally-baker-98314)

Artist

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188450)

The National Digital Learning Resource Network

Teachers, jurisdictions, associations and publishers can select and prepare digital resources for sharing at the national level through the National Digital Learning Resource Network (NDLRN).

The criteria for quality digital resources are outlined in the Education value standard for digital resources. Education Services Australia provides an infrastructure through NDLRN to facilitate distribution of digital resources to all educational jurisdictions and sectors in Australia.

<http://www.ndlrn.edu.au/developing_digital_resources/sharing_digital_resources/sharing_digital_resources.html>

3 months ago [report](http://theconversation.com/comments/188571/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Sally Baker](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188571)

Once again, thanks Sally - I've just checked out their website and I guess others have, too. Do these digital resources directly inform the national curricula, or to phrase this differently, what's the conduit between the digital network and AITSL/the national curriculum?

You seem to have some personal experience of this group and its activities/scope, so if you could please provide a little more info. on it, that would be great.

3 months ago [report](http://theconversation.com/comments/188824/abuses/new)

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**Geoffrey Harold Sherrington**

Boss

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188450)

Christine,   
There are many concepts that have both an old traditional view and a modern view in conflict. There is a delicacy in the transition.   
Here is a rock painting in situ that is likely to be there for many more years.   
<http://www.geoffstuff.com/WomensBusiness.jpg>   
The theme as explained decades ago was that the rainbow serpent on some nights would bite a mature woman in the genital region, as shown. If no blood appeared, then the woman had cause to think she might become a mother. Nowadays…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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The theme as explained decades ago was that the rainbow serpent on some nights would bite a mature woman in the genital region, as shown. If no blood appeared, then the woman had cause to think she might become a mother. Nowadays the menstrual cycle mechanism is more specific.   
A question is, how does one make the change from what the locals can see whenever they visit this old site, to the modern medical explanation? Is a full change desirable, is there a half-way point (the 'long break') or is there no harm with letting the story continue in the form told to us (which itself might be a modification of the painter's intention)?   
You are asking people to disbelieve information in pictures far older than the appearance of people with their competing theories. I ask this with no idea of how to answer it, but to explain some complexity that is a little more though-provoking than kicking a pigskin around a paddock many days of the year.

3 months ago [report](http://theconversation.com/comments/189478/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

The degree of interest in this post indicates the level of interest and concern of the topic, but the it's time for a reality check, since the comments are broadening beyond reasonable bounds, attributing all sorts of benefits to the inclusion to mainstreaming indigenous languages, cultures and learning processes. It is further degenerating in to "we should, they should" solutions to an intractable problem. As stimulating as the discussion is, it ignores the imperatives of our time. Australia…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

The degree of interest in this post indicates the level of interest and concern of the topic, but the it's time for a reality check, since the comments are broadening beyond reasonable bounds, attributing all sorts of benefits to the inclusion to mainstreaming indigenous languages, cultures and learning processes. It is further degenerating in to "we should, they should" solutions to an intractable problem. As stimulating as the discussion is, it ignores the imperatives of our time. Australia as a nation is in competition with others that are not agonising over such issues, and we cannot indulge ourselves as is being suggested. The loss of indigenous languages is not a non-indigenous conspiracy as suggested, but rather evolution. In particular, it is NOT the fault of the teachers, as also suggested. The gap will not be narrowed by modifying the curriculum. To enable the students to have equitable access to further education, they need to be schooled in the world language of commerce and industry, which of course is English. By all means preserve culture and tradition, but this must be done as extra-curricular activities. And by all means encourage and support those who feel it is their vocation to assist, but make sure this contributes to the main game, ie, give these kids the opportunity and means to achieve.

3 months ago [report](http://theconversation.com/comments/188454/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188454)

John you're absolutely right in that the comments are broadening "beyond reasonable bounds" and that we are dealing with an intractable problem. I don't expect a forum such as this would offer silver bullets, but the broadening of the discussion in itself may not be a bad thing in that it may throw some light on the nature of what many define as a 'problem'. It reminds me of what I heard Rosalie Kunoth-Monks start a speech with: "In Australia we don't have an Aboriginal problem. We have a white-fellow…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Your comment clearly sets out the beliefs of a large number of people (probably a majority). John Howard at the start of the Intervention was at Ntaria (Hermannsburg) and put it in a nutshell when he stated "For Aboriginal people to have any future at all, they will have to join the mainstream"   
Many consider that the Imperative of our time is as you suggest that we be competitive in that house of cards which is the Global Economy. Some of us question this, and consider it is far more imperative for humanity to stop racing like lemmings (a myth- lemmings don't actually do this) to the cliff that is climate change.   
To invoke evolution as a cause of language extinction (thereby assuming its inevitability) is misusing Darwinian principles like Colonial powers not all that long ago used "survival of the fittest" as justification to subjugate indigenous peoples around the globe.   
Less than a century ago we had Daisy Bates "smoothing the dying pillow" of Aboriginal Australia, and more recent than that about 50 Km from here we had more than 50 men women and children massacred in revenge for the murder of a lascivious white man. Yes John I'm broadening my comments beyond reasonable bounds. As well as which I've run out time (hoe 'western is that!')so have to leave it at that.

3 months ago [report](http://theconversation.com/comments/188491/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188491)

Frank, if one there's one thing this thread has clarified is that the Warlpiri issue is a completely separate issue to any "Aboriginal/Indigenous" issues, and that we should we not conflate them.

3 months ago [report](http://theconversation.com/comments/188498/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188498)

Not sure what you mean David.   
It's a bit like saying 'The Dutch issue is a completely separate issue to any "European/Caucasian" issues.   
The reason I use 'Warlpiri' is because these are my friends and neighbours and because I am aware of the great diversity within Indigenous Australia. I suspect this is also the case with Christine.

Similarly I might talk about Dutch people (I'm Dutch born) and not use European in recognition of the great diversity among peoples in that part of the world.

Really I must go, the European imperative to turn up somewhere at a certain time on time beckons.

3 months ago [report](http://theconversation.com/comments/188502/abuses/new)

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[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

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Farmer

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188454)

Evolution is it? A sort of linguistic misunderstanding of survival of the fittest?

You are of course correct that these kids need to learn English - amongst other things. We should probably be learning Chinese.

See the thing is John this bilingual stuff actually works - unlike any sort of tough love, exhortation and incentives. The schools using a bilingual program were pulling 90% attendance rates... even during the honey season.

There's some nasty history to all this stuff - and being…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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There's some nasty history to all this stuff - and being the NT it is bitter and personal. To get a flavour have a read of this:

The author finds that contrary to the NT Government's view, the NAPLAN tests and school scores showed the bilingual schools performed well.

"Devlin (2009) has since demonstrated that the evidence tabled by the Minister was incomplete and invalid. Using official NAPLAN   
data that the Federal Government had made available through the MySchool website, he has shown that Year 3 students in the Government’s ‘bilingual school’ sample performed better   
than the comparison group on four out of five tests; namely, (1) Reading, (2) Spelling, (3) Grammar and Punctuation, and   
(4) Numeracy; only in Writing did they lag behind (cf. Wigglesworth, Simpson & Loakes, this issue)...

Now the point is that to get these kids to learn anything at all we've gotta get them at school. It's about ownership and being relevant to them I guess. It's certainly not about ability or capacity. These kids are born linguists... but they don't do well when we try and stuff our words down their throats. It's not the words... it's the power, the authority of it.

Put simply little kids - particularly younger kids - who do not hear English at home at all - are suddenly plonked into a big building with a strange language and all this odd stuff. The exclusive dominance of English puts the whole business behind the eight ball from day one. Remember, they used to cane the kids for speaking language at school back in the tough love era.

But part of that big challenge of gap bridging is finding the keys to capture enthusiasm and involvement - not just of the kids either. Language of schooling for NESB kids (and their parents) is a big statement of who owns the place and everything about it... not too much to do with them or life as they know it or see it ahead.

I am not a we-should or they-should kinda bloke myself John - but I do think that this issue of education - integrating schooling into aboriginal community life... a sense of ownership and control - participation and enthusiasm - is an essential ingredient in the mix... one of those keys.

3 months ago [report](http://theconversation.com/comments/188503/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188454)

John, I know this to be a thoughtful post on your part, but I must differ on certain points you've made here. Frank has already commented on your statements about Australian languages (the linguistically accurate name for Australia's Aboriginal languages), but I'd like to add to that critique, especially because this article has appeared in the science and technology stream of The Conversation.

It's simply not valid to attempt to apply scientific principles to the dramatic Indigenous language…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

John, I know this to be a thoughtful post on your part, but I must differ on certain points you've made here. Frank has already commented on your statements about Australian languages (the linguistically accurate name for Australia's Aboriginal languages), but I'd like to add to that critique, especially because this article has appeared in the science and technology stream of The Conversation.

It's simply not valid to attempt to apply scientific principles to the dramatic Indigenous language loss post-colonisation, as you've done here. In fact, it's a form of the now-discredited Social Darwinism, whereby putatively scientific explanations are applied to what are in fact social phenomena - and we need to look at social explanations in cases like this, not evoke some 'higher order' (pseudo-) scientific explanation. 'Language death' via so-called forces of 'evolution' is not inevitable in the way that's being suggested here.

To educate children in their own natal tongue, when that is the language of that specific 'country' (and I'm using the word 'country' here in the way that it's used in Aboriginal English) isn't an indulgence - at one level, it's simply practical, but there's a lot more to it, too. Included among the other factors is Aboriginal parents' strong resistance to the English-only education being offered to their kids at present. It is clearly not the best case scenario to drag kids off to school, not only against their will, but against the will of many of their extended families.

The other point that I'd like to make in response to this is to highlight a frequently made error on the part of critics of bilingual education. When children begin school speaking an Aboriginal language (or any other language), with a genuinely bilingual education, they need English-as-a-Second language lessons and a structured ESL program delivered by qualified ESL teachers. It is a matter of considerable concern (and that's an understatement) that today only a minority of teachers teaching in Aboriginal communities where the community's language is still their first language, actually hold such a qualification. For there to be any real change this needs to be addressed as a matter of urgency, especially because there is still a high incidence of otitis media-caused deafness in these communities. This means that oftentimes kids are struggling with a language that they cannot understand with the additional factor of not being able to hear it properly. The greatest failure of the bilingual education programs has been in servicing the ESL component, and offering decent structured English language lessons, such as migrant/refugee children receive pretty well automatically when they begin school.

All of the Aboriginal parents I know DO want their kids to learn English, as you say, the mainstream language in Australia, but not at the expense of their first language. In addition, there needs to be provision of properly qualified and experienced ESL teachers for this to happen. Contrary to populist opinion, it's not the Aboriginal language side of it that presents the major problem, but this seeming refusal to recognise the children's ESL status. Much of the world is bilingual, but in this respect Australia remains something of a global anomaly.

Finally, the point about other nations 'not agonising over such issues' is not accurate, or if indeed they don't agonise, it's because they've already given legislative protection to their Indigenous languages. The Welsh Language Act, for example, affords equal legal status to the Welsh and English languages and spells out Welsh language rights in every area of life. The legislation covers district or community councils, National Park, Police, Fire and Health authorities, banks and credit unions. In practice this means that these bodies are obliged by law to provide interpreter services and appropriate dual signage when such services are requested. There are many more similar example worldwide.

And finally - I don't think that it's valid to state that the 'broadening' of the comments is problematic, because there ARE in fact many aspects to this, all of which need airing. Yes, there has been a broad-ranging topics discussed here, but that's because they are interconnected. For example, the language/s of instruction can hardly be "off the table" and the most recent commenter, Sally, has been talking about the national curriculum and that was the original raison d’etre for this article.

3 months ago [report](http://theconversation.com/comments/188710/abuses/new)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188710)

Excellent point re the Welsh Christine ... the revisited concern to recognise and restore the language (and by implication the culture) follows hundreds of years of active legal suppression.

The bloody Tudors started it back in 1535 ... Henry VIII - himself a welshman... decided to do to Wales what he was doing to any female in arms' reach in Court ...

Section One:   
""...because that the People of the same Dominion (Wales) have and do daily use a speche nothing like, ne consonant to the…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Section One:   
""...because that the People of the same Dominion (Wales) have and do daily use a speche nothing like, ne consonant to the natural Mother Tongue used within this Realm, some rude and ignorant People have made Distinction and Diversity between the King's Subjects of this Realm, and his Subjects of the said Dominion and Principality of Wales, whereby great Discord Variance Debate Division Murmur and Sedition hath grown between his said Subjects;..." and then declares the King's intention towards his Welsh subjects "...to reduce them to the perfect Order Notice and Knowledge of his Laws of this his Realm, and utterly to extirpe all and singular the sinister usages and customs differing from this Realm and to bring the said Subjects of this his Realm, and of his said Dominion of Wales, to an amicable Concord and Unity..."

This is what a State language does. Not just a language of commerce and success - a medium of conformity and dominance. The medium.

From the mandatory use of Bahasa Indonesia to the compulsory Russian and yes even our lovely English ... language is the most effective form of flag planting there can possibly be. And yes it always comes dressed in opportunities and assimilated equalities.

And, always there is reluctance and awkwardness from those been equalised. There is a dismemberment to it. We are still taking children away.

3 months ago [report](http://theconversation.com/comments/188723/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188723)

Great post, Peter. A terrific, very telling background narrative highlighting the injustices meted out to the speakers of Welsh over such a long time..

I'm reminded of another historically-verifiable anecdote that I believe is equally telling in this context:

In 1492, Antonio de Nebrija completed a Castilian grammar book, the first ever completed of a European language. When he presented it to Queen Isabella she asked, "What is it for?", and the Bishop of Avila answered for de Nebrija…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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As opposed to the case of Welsh, which has had a more or less happy ending (at least for the moment) it certainly hasn't been a case of slow-combustion form of 'evolution' (or other 'natural' processes) that have wiped out many of the world's Indigenous languages in the last hundred years.

3 months ago [report](http://theconversation.com/comments/189003/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189003)

Christine, actually it is precisely about evolution. Evolution is about adaptations to an ever-changing environment. As all the recent research has shown, scientific literacy amongst this country's school kids has declined - both absolutely and relatively - along with verbal and quantitative literacy over the past 15 years. And here you are wanting to shove dreamtime lore into the space where evolution, mechanics, and chemistry should be taught!

3 months ago [report](http://theconversation.com/comments/189051/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189003)

For those interested in this sort of thing, I recommend you look up the history of Guarani. Guarani survived ironically in part due to the Jesuits that used it to communicate (written and spoken) between 'outposts'. A few decades ago Dictator Stroessner (spelling?) declared Guarani and Spanish to be Paraguay's national languages. Today Paraguayans are proud of their native language and I read somewhere that Paraguay is the only country in the Americas where the Indigenous language is spoken by a majority of the non-Indigenous citizens.

3 months ago [report](http://theconversation.com/comments/189075/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189075)

Frank, 3,000 people speak Warlpiri. 22 million speak English. English is the indigenous language of Australia.

3 months ago [report](http://theconversation.com/comments/189082/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189051)

I have to repeat it:   
"... All societies are constantly evolving. Indeed a culture survives when it has enough confidence in its past and enough say in its future to maintain its spirit and essence through all the changes it will inevitably undergo. ” ― Wade Davis, The Wayfinders   
It's the "enough say in its future" bit that I find the most relevant to the current situation remote Aborigines find themselves in.   
To dismiss Warlpiri 'Weltanschauung' as mere 'dreamtime lore', that should have no space in our education system, is not doing it justice. It is just another subtle way by which our dominant society denies Aboriginal society a say in its future.   
As this forum has clearly shown incorporating Aboriginal knowledge etc. into the national curriculum is no simple matter. If we don't succeed in doing so we will all be the poorer for it.

3 months ago [report](http://theconversation.com/comments/189095/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189082)

As Manuél from Barcelona would say: ¿Qué?   
'Dominant' I'll accept, but Indigenous?   
In Richard Trudgen's book 'Why Warriors Lie Down and Die', there is a beautifully named chapter:   
"What Language do you Dream in?"   
At the time I read it I pondered how this applied to me. My more than half a century in Australia resulted that I dream in English. Did it bother me that I no longer dreamt in Dutch (my mother tongue) or Spanish (my childhood language). No it didn't one bit. Millions of people dream in those languages. There are only 3,000 people that dream in Warlpiri. That is a worry to me.

3 months ago [report](http://theconversation.com/comments/189119/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

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In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189095)

Strongly agree with this post, Frank, although I can't agree that such language use is as subtle in its undermining effect as you’ve suggested here, in terms of describing Indigenous religion.   
The ideological intent of such deliberately derisory use of language - “dreamtime lore” - gives the game away I'm afraid.

Why not use the terminology of the local language, in this instance, ‘Jukurrpa’, the semantic scope of which is far more comprehensive than such impoverished and inadequate English translation as connoted by 'dreamtime'.

And as for the word 'lore' - Law is the mot juste, surely...bringing to mind the celebrated Pope Gregory quote “Non Angli, sed angeli…” – and the social context of that statement wasn’t so very different from this one, really…

3 months ago [report](http://theconversation.com/comments/189245/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189245)

Christine, given your low opinion of actual, real Mathematics and Science, naturally your lessons on Jukurrpa, shall be followed by lessons on the sorcery and magic still rife in remote Aboriginal communities today?

3 months ago [report](http://theconversation.com/comments/189366/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189366)

Argumentum ad absurdum...reductio ad absurdum.

You are not engaging with anything that I have actually written David, in either the article or in my subsequent posts. In future, if you wish to make comments, you will need to back them up with actual quotations taken directly from my article, or DIRECT QUOTATIONS (and not merely selective two or three word 'quotations' taken out of context) either from my responses or from the posts and responses of others, David.

The Conversation is a serious discussion platform, which requires thoughtful and reasonable responses. It's not Facebook, or some kind of social media platform that gives rise thoughtless slinging matches between teenagers, so please don't treat it that way.

3 months ago [report](http://theconversation.com/comments/189370/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189366)

David, what do you base: "on the sorcery and magic still rife in remote Aboriginal communities today?" on?   
Next thing you'll tell us that cannibalism is commonly practiced in remote Aboriginal communities.

As for your allegation that Christine has a "low opinion of actual, real Mathematics and Science" again I fail to detect any evidence of this in this wide ranging and fascinating discussion. And what do you mean by "REAL Mathematics"?

Remote communities suffer enough from stereotyping and stigmatization for your prejudiced generalizations to remain unanswered.

3 months ago [report](http://theconversation.com/comments/189375/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189366)

David,

There is nothing unactual or unreal about the science and mathematics embodied in my ancient old boomerang over there on the wall. It is a real, three dimensional, concrete fact.

It is worth wondering surely how a "stone age culture" managed to "stumble across" the principles behind Bernoulli's equations governing lift and thrust don't you think? Makes "stumbling across" the wheel look rather crude and unsubtle don't you think?

Took us a long time, a lot of blackboards and squiggles…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

David,

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Took us a long time, a lot of blackboards and squiggles and a few Leonardos and the like along the way to manage such complex abstraction. The locals got there by watching - a lot, for a very long time.

The point is surely David that there are aspects of Aboriginal culture and understanding that are worthy of study and respect. If for nothing else than the purely commercial and utilitarian motives of medicinal uses of plants and the like.

There are also - more subtle - aspects to local knowledge which are derived from the world's longest running longitudinal study on landscape, flora and fauna and how to survive in this tough and variable place.

One of the great mistakes we make when we picture traditional local culture is to project some sort of nomadic hunter gatherer band of wanderers scraping a bare subsistence on the fringes of some stoney desert. This is not true.

Increasing archeological evidence points to a remarkable diversity of local cultures and traditions, from rather sedentary lives farming eels and living in stone houses in Victoria to lolling about on Manly Beach guzzling fish and oysters through to vast networks of trade and commerce that spanned the country and beyond.

There is one lovely description from a Sydney first fleet diary of watching an Aboriginal woman giving her dozing husband a kick to tell him to find something for lunch. Up he gets and wanders over to a stand of trees... each with steps cut in them... he climbs each in turn and reaches into a hollow and collects from each a possum - dispatched with a whack against the trunk of the tree... dinner is served. Not your average hunter gatherer at all really. I wonder which of his or her great great grandfathers carved those steps.

Now speaking of old days - it would really be worth the effort David to read a couple of books - first up: Watkin Tench's diaries and secondly Lieutenant Dawes' journals (the latter particularly poignant and leaning heavily towards language). Both of these give a remarkable insight into the profound respect and admiration the first settlers here had for the locals... quite surprising really given the subsequent events.

But in the first instance, folks like Tench and Dawes and Phillip were struck by the bearing, dignity and confidence of the locals - also by their amazing facilities for language and mimicry ... incredibly quick learners apparently. And outrageous pranksters and comedians.

My point is David that one gets a very different idea of traditional culture if one goes back to primary sources - a sense of what was here and what remains - and it raises the question of whether we can put back some of what was here - of what is actually involved in reconciliation and redress.

More to the point, David, such eyewitness accounts give the lie to purportedly limited capacities and abilities inherent in "traditional" ways. Like I said, the locals were quick learners.

We are looking at something very different now - something less cohesive and confident... less capable perhaps in both our terms and theirs. It is now about survival, both culturally and individually.

The question is what to do about it. You seem to be suggesting a return to the prescriptions of previous decades. They failed. Not that that seems to matter.

There are no doubt keys to unlock the capacities of these capable and adaptable people ... Footymetrics might be one of them... a multimedia maths course - with lots of live coverage - with explanations of the white fella maths and physics from a smart articulate AFL star or two - yes, they have them.

I've got a hunch language itself might be another key if we work out how to turn the thing

3 months ago [report](http://theconversation.com/comments/189443/abuses/new)

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**Geoffrey Harold Sherrington**

Boss

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189443)

Peter,

"a smart articulate AFL star or two..."   
Like the coach who said on radio "There's always doubt. No doubt about that."   
Or his mate who mentioned "A good-sized quarter acre block". I have a collection of these.

You are a little way out of the bad corner, Peter, because you've displayed some signs of scholarship and original sources above. But please, don't mention AFL. It is one of the least sustainable mass pursuits of Melbourne. Indeed, I used it to illustrate a couple of lead articles on Jo Nova, whose reading is encouraged as part of your continuing education, not because of the choice of authors or topics, but because of the diligence of selection of relevant articles and papers. There is a lot of raw data there. Sure, some of the respondents get it wrong, as do I, as examinees do, but that is a feature of many blogs. Diversity makes one think harder.

3 months ago [report](http://theconversation.com/comments/189464/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189443)

Peter, great stuff you've been digging up and harvesting.   
By contrast to those enlightened first fleeters, in Malthus’ An Essay on the Principle of Population' you find this:   
“A native with his child, surprised on the banks of the Hawksbury river by some of our colonists, launched his canoe in a hurry, and left behind him a specimen of his food, and of the delicacy of his stomach. From a piece of water-soaked wood, full of holes, he had been extracting and eating a large worm. The smell both…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Chapter I: “Of the Checks to Population in the lowest Stage of Human Society:   
“The wretched inhabitants of Tierra del Fuego have been placed, by the general consent of voyagers, at the bottom of the scale of human beings...”   
“...Next to these, and almost as low in genius and resources, have been placed the natives of Van Diemen's land; but some late accounts have represented the islands of Andaman in the East as inhabited by a race of savages still lower in wretchedness even than these...”   
“...In the next scale of human beings we may place the inhabitants of New Holland,...”   
One would have hoped that such beliefs and pronouncements would have gone the way of the Flat Earth Society in the ensuing century and a half. Then again in the 21st.Century we have people that have been subjected to three 'hundred year" floods in a decade and remain firm in their conviction that the climate isn't changing. The Emperor remains naked despite being able to buy Bangladeshi vestments for a song.

3 months ago [report](http://theconversation.com/comments/189499/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**Geoffrey Harold Sherrington**

Boss

If you came to melbouren with no prior knowledge of its activities, you think the people were partly mental. Here we are, crying our eyes out at the need to shut down fossil fuel plants then bingo! the lights come on at the MGC and a few other play pits. Hundreds of thousands of people travel to these sites each weekend in the season. There is a huge production per capita of the deadly CO2, just for entertainment. Foopball must be about the first activity to be closed down by the CAGW people, if…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

If you came to melbouren with no prior knowledge of its activities, you think the people were partly mental. Here we are, crying our eyes out at the need to shut down fossil fuel plants then bingo! the lights come on at the MGC and a few other play pits. Hundreds of thousands of people travel to these sites each weekend in the season. There is a huge production per capita of the deadly CO2, just for entertainment. Foopball must be about the first activity to be closed down by the CAGW people, if they used logic. After the games, hospitals get many cases of sports damage and people with lesser celebrity have to wait, even those who did not volunteer to get injured. More money wasted.   
It's a case of familiarity having bred contempt.   
As for the aboriginal component, having worked in the field since 1973, I guess I've seen just about every experiment that whiteys could think of or write about. Here is another, but it is zany. There is a dominant factor that will improve the lot of unhappy aborigines and that is the gaining of self esteem over time. Ask the ones who have achieved this. They will probably dislike the kin who have not made the effort.   
Governments and academics can devise programs with monikers like assimilation, integration, interbreeding, prevention of interbreeding, showering with sit down money ... the weakness in all is that none has worked for so many aborigines. It will take generations for true equality to occur and it is certainly not hastened by the experiment of one theory after another. That just leaves people confused.   
A golden rule is to absolutely avoid legislation that is based on tribal differences that some call race. Differences expressed in legislation serve to divide, far more often than they harmonise. When I was a school child, in some remote parts of Australia, it was all in together and there were no major problems. These came later when eddicated people devised social engineering schemes from ivory towers.   
Leave them alone, they have suffered enough as political footballs.

3 months ago [report](http://theconversation.com/comments/188768/abuses/new)

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Farmer

In reply to [Geoffrey Harold Sherrington](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188768)

Ah yes the good old days eh Geoffrey Harold?

They'd be the good old days of trachoma and mass child deaths and missions ... and the days of working for rations on cattle stations... of having your wages confiscated by the State Government, of having your kids pinched by the State... of not having a vote, of having to ask permission to move or get married, of not getting to have a swim in the local pool or sit in a seat at the local cinema, or get a drink in a pub, ... when they were classified as fauna... yep... nostalgia just ain't what it used to be.

3 months ago [report](http://theconversation.com/comments/188775/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Geoffrey Harold Sherrington](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188768)

"There is a dominant factor that will improve the lot of unhappy aborigines and that is the gaining of self esteem over time." That is one important nail you've hit on the head Geoffrey. Esteem or respect from others is also necessary. To categorize everything that has happened in remote Aboriginal Australia the last half a century as failed social engineering experiments is however unfair and doesn't give credit where it is due. There have been many positive things happened out here, this is especially…

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"There is a dominant factor that will improve the lot of unhappy aborigines and that is the gaining of self esteem over time." That is one important nail you've hit on the head Geoffrey. Esteem or respect from others is also necessary. To categorize everything that has happened in remote Aboriginal Australia the last half a century as failed social engineering experiments is however unfair and doesn't give credit where it is due. There have been many positive things happened out here, this is especially so when local initiatives were given encouragement and support or when outside initiatives included involvement of locals on an equal footing. I believe some years ago Eva Cox was involved in setting up a web-site "The things that work" or some such. I think it's time we revisited it (does anyone have the link?).   
In April 2012 Arena Magazine devoted an issue to the Intervention. I was invited to write an article. I did so after many conversations on the topic with Warlpiri people. The one "slogan" that emerged I incorporated in the title. Geoffrey, in light of your final sentence, you might be interested to know that the article was titled:   
Cultural Genocide by any other name…   
Yampiyalu-nganpa (Leave us alone)

I learned another Warlpiri phrase at the time. From the article:   
"When I asked Jakamarra what he thought of the Intervention, of Closing the Gap, of Stronger Futures, he replied Murramurralku (we’re sick and tired of it). In other words they’ve had a gutful."

Just one more pedantic observation on your post:   
" They will probably dislike the kin who have not made the effort."   
In the current socio political environment the opportunity to "make the effort" in remote areas is virtually non existent. A little bit like those queues that asylum seekers are urged to join.

3 months ago [report](http://theconversation.com/comments/188962/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Geoffrey Harold Sherrington](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188768)

Thank you for your post, Geoffrey. You're absolutely right about footie (ie AFL, especially) fever taking hold of so many Australians of all backgrounds during the winter months, and this is why I do believe that using it as an exemplar in maths and other classes is such a good idea, potentially.

And not just potentially - teachers like Warren are already using the idea productively in classrooms, as you'll see from previous posts.

3 months ago [report](http://theconversation.com/comments/189436/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**Geoffrey Harold Sherrington**

Boss

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189436)

Christine,   
AFL is better than South Park, is it?   
Have you considered if you are demoralising many people by promotion of elementary concepts?

3 months ago [report](http://theconversation.com/comments/189899/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Beth Graham**](http://theconversation.com/profiles/beth-graham-98681)

logged in via email @netspace.net.au

Great Article Christine. The focus on AFL was brilliant. We had written all that spatial stuff into the Transition Curriculum but those books have been long gone.

My favourite story to illustrate what the kids knew about spatial orientation came from an incident that occurred at Yirrkala in the 70's. A grandmother was in the bush with 2 small chn. She had some kind of a mental breakdowm, left the chn and returned to Yirrkala on her own. There was a great fuss and people set out to…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Great Article Christine. The focus on AFL was brilliant. We had written all that spatial stuff into the Transition Curriculum but those books have been long gone.

My favourite story to illustrate what the kids knew about spatial orientation came from an incident that occurred at Yirrkala in the 70's. A grandmother was in the bush with 2 small chn. She had some kind of a mental breakdowm, left the chn and returned to Yirrkala on her own. There was a great fuss and people set out to look. They met the 5 year old on his way home. He had been walking for 3 days. He said the 3 year old had got tired so he had made a 'nest' for him and told him to wait until he returned. The 5 year old then turned round and took people back to where he had left his little brother. Not only had he known how to find his way but he had also found water and bush food. I looked at my own chn and realised that in similar circumstances they would have died.

We need bilingual edn so Indigenous children can start school with the knowledge inherent in their view of the world and not where our curriculum says they should be.

Christine I look forward to the next article. Keep it up.

3 months ago [report](http://theconversation.com/comments/188784/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Beth Graham](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188784)

" I looked at my own chn and realised that in similar circumstances they would have died."   
OTOH, your own children will grow up able to comprehend and learn geometry, algebra, and calculus, train as engineers, bionformatics, economists, or doctors. They will be able to pick up, move to any society/culture on the planet, ply their trade, and thrive. What future do you think your 5 old tracker has?

3 months ago [report](http://theconversation.com/comments/189060/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189060)

If the 5 year old tracker hadn't known how to track, he would have had no future at all.

The world would be a sad place if a person's quality of "future" was defined solely by an ability to comprehend geometry, algebra and calculus and train as engineers, bionformatics (what are they?), economists or doctors.

3 months ago [report](http://theconversation.com/comments/189133/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Beth Graham](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188784)

Thank you so much for these comments Beth, and especially for the story about the little kid successfully navigating his way back towards home, not to mention his common sense approach to his little brother. This anecdote encapsulates so much information about the superiority of even very young children in terms of their mathematically-based spatial understandings, counterpointing the large number of 'lost white' children narratives in Australian literature and film (for example, Walkabout…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thank you so much for these comments Beth, and especially for the story about the little kid successfully navigating his way back towards home, not to mention his common sense approach to his little brother. This anecdote encapsulates so much information about the superiority of even very young children in terms of their mathematically-based spatial understandings, counterpointing the large number of 'lost white' children narratives in Australian literature and film (for example, Walkabout).

Most importantly, you've pointed out that this spatial aptitude has been recognised for some time, and included in past curricula. We collectively need to become more strongly committed to the idea of a Best Practice volume, drawing together past successes in curriculum innovation and implementation in this area. It is simply not true that Aboriginal education has been marked by universal dysfunction, as some would have us to believe, because there have indeed been significant pockets of success in the past - and present. Your important and highly effective long-term work at Yirrkala Beth, along with that of many past and present equally talented, committed and in some cases, brilliant, Yolngu teachers, is testament to that. This was achieved by working side by side - a genuinely level playing field approach. And there needs to be more of that today, rather than the current heavy-duty emphasis on deficit models/approaches.

3 months ago [report](http://theconversation.com/comments/189367/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Beth Graham](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188784)

P.S. Beth (and important).

Could you please say a little more about the \*\*\*specific ways\*\*\* in which you incorporated spatial relationships into the curriculum at Yirrkala in the 1960s and 1970s? That would be great, especially as I'm collating all of these ideas and will put them into a larger paper, so it's important to collect them all right now.

A paragraph or two in reply to this request would be terrific, so please post it on this site.

Thank you, Beth.

3 months ago [report](http://theconversation.com/comments/189439/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189439)

"\*\*\*specific ways\*\*\* in which you incorporated spatial relationships into the curriculum"   
Pssssttttt...in the dominant culture, this is known as "geometry", "geography", "calculus" and so on. It has been the foundation of school curricular for around 2,000 years now.

3 months ago [report](http://theconversation.com/comments/189496/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189133)

If I had as much confidence of folks here is the reality of these spatial abilities and superiorities, the first place I would be looking at is genes. Populations who evolve in environments highly isolated and/or markedly different than other populations will see different results of natural selection; especially over the tens of thousands of years we are talking here. Has any DNA sampling been gained from the Warlpiri so such analyses could be undertaken?

3 months ago [report](http://theconversation.com/comments/190788/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christina Davidson**](http://theconversation.com/profiles/christina-davidson-52582)

CEO at [ANKAAA - The Association of Northern Kimberley and Arnhem Aboriginal Artists](http://theconversation.com/companies/ankaaa-the-association-of-northern-kimberley-and-arnhem-aboriginal-artists-818)

In reply to [Beth Graham](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_188784)

Thanks for sharing this great story

2 months ago [report](http://theconversation.com/comments/207347/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Colin Farrelly**](http://theconversation.com/profiles/colin-farrelly-99273)

Consultant

Loved your article Christine - and wow what a discussion that follows!

Many years ago I picked up a book at a second hand bookshop called “The Psychology of Aboriginal Australians” (Kearney, de Lacey and Davidson, 1973) and I was impressed by the research that demonstrated how indigenous Australians performed significantly better than other groups at tests involving spatial ability, despite doing badly at most of the classical intelligence tests.

So it was a delight to read your article about…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Loved your article Christine - and wow what a discussion that follows!

Many years ago I picked up a book at a second hand bookshop called “The Psychology of Aboriginal Australians” (Kearney, de Lacey and Davidson, 1973) and I was impressed by the research that demonstrated how indigenous Australians performed significantly better than other groups at tests involving spatial ability, despite doing badly at most of the classical intelligence tests.

So it was a delight to read your article about how enhanced spatial awareness might be contributing to the success of indigenous footy players. I agree that there is something about Australian Rules that gets the best out of people who have enhanced spatial capability. I would extend this to “situational awareness”, which is a military term that includes the context of the spatial arrangement of the players and objects. So in footy you need to know not only the arrangement and trajectory of players in front and behind you and the likely trajectory of the ball several moves ahead, but your strategy also depends on such things as the prevailing weather conditions (especially wind and rain) and the time left in the game in comparison to the score. So maybe there is more to the equation than just spatial awareness. Situational awareness is clearly a survival necessity and so is likely developed strongly in all traditional hunter/gatherer cultures.

On many occasions, I’ve tried to explain to overseas visitors the nature of our unique game and how it differs from other football codes. Since it’s often American visitors who are fascinated and bewildered by the game, I often say that they need to get their heads around the fact that the game is played “man to man” rather than in zones. They understand this from basketball. They are usually impressed by the fast pace of the game and the ball handling skills of players that can be tacked from any direction. I also tell them that the early Irish gold diggers got together with the local aborigines to craft a hybrid between their respective traditional football games - and yes I know I’m stretching the truth a long way, but never let that get in the way of a good yarn!

I’m not a big believer in the genetic difference arguments. I don’t doubt there are some physiological characteristics that may have been enhanced in isolated populations and that this might even extend to some cognitive abilities. However, it seems to me that every time someone tries to prove a genetic basis for any human cognitive ability, they find instead the environmental (mostly social) factors are dominant. Modern humans have evolved over hundreds of thousands of years (and millions if you include our nearest ancestors), and so the differences that have evolved over the last 50,000 years have been mostly social and not genetic. In addition, if you go back just 5,000 years, we were virtually all stone-age cultures.

So I think there is great value in seeing if we can learn something from cultures who are more in tune with how we relate to each other and to our environment. Our current dominant culture is only 1000 years in the making and very removed from how we developed over the lifespan of our species.

I also like the idea of investigating whether we can add something to that way we teach mathematics that takes advantage of some of these strengths in our local indigenous cultures. I can think of lots of things that could be downplayed to make room for it, but I hesitate to stick my nose into the educational curriculum debate!

3 months ago [report](http://theconversation.com/comments/189278/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Colin Farrelly](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189278)

Many thanks Colin for this terrific and informative post, and your point about “situational awareness” is well taken - it really adds something to the discussion. In fact, it's no doubt possible to construct a Venn diagram of some sort around “situational awareness” and "spatial awareness" although they're not 100% synonymous of course.

Although you're hesitant about entering the educational curriculum debate, your post had left me with an appetite to hear more of your ideas, so please go for it!

At a later date I'll be collating all of these comments (well, the sensible and constructive ones like yours) and I'd like to add your curriculum ideas into the mix. Thanks again, Christine

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[**Colin Farrelly**](http://theconversation.com/profiles/colin-farrelly-99273)

Consultant

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189374)

Christine – happy to expand on my last point, but I’ll try to restrict myself to areas I know something about.

I spent the early part of my career (in the 1980s) developing software for minerals exploration and consulting in mathematical geology. This was mainly to do with the collection, management, analysis and interpretation of spatially located geoscientific data.

The existing commercial software could do all sorts of number crunching, but handling the spatial aspects required purpose…

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I spent the early part of my career (in the 1980s) developing software for minerals exploration and consulting in mathematical geology. This was mainly to do with the collection, management, analysis and interpretation of spatially located geoscientific data.

The existing commercial software could do all sorts of number crunching, but handling the spatial aspects required purpose built software, which thankfully these days is also available off-the-shelf. When I was programming, having a sound understanding of algebra and trigonometry was vital. The geologists and technicians who used the software, however, didn’t need to have such a detailed understanding. In addition, there was once a vibrant local software industry that serviced the mining industry, but these days it’s mostly controlled by large overseas players, so even the programming jobs are getting rare locally.

The problems being addressed by such software are becoming ever more complex, with more and more data being collected and the problem of finding and developing orebodies becoming ever more difficult (deeper, lower grades, complex mineralogy, etc). So this means that the skills required by the geoscientists and engineers need to be expanded to improve their ability to analyse and interpret this multi-variate and multi-layered data.

So this is where I think better skills in identifying patterns and relationships in spatial data (including changes over time) would be better foundations than algebra and trigonometry.

Similarly, many basic engineering and accounting tasks are completely handled by software, so even for those “numerate professions” do we still need the same type of mathematical grounding that was necessary 20 years ago?

I’m not for one moment saying we need to remove algebra and trigonometry from the mathematics syllabus in schools. They are the foundations for so many other concepts. However, I am calling into question the amount to attention they get, when things that could be described as spatial mathematics get very little.

I would also add systems thinking to the list of things we need to start teaching at a very early age. This could also be an area where indigenous knowledge has something to offer, including its part in the broader topic of situational awareness.

Btw, I like your idea of constructing a Venn diagram. However, I think that you could best use one to describe the components that make up situational awareness, since it’s a more over-arching concept. That is, I can imagine circles for spatial awareness, social awareness, temporal awareness, process awareness, etc.

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Colin Farrelly](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189518)

Thank you for this response Colin, which I find interesting and thought-provoking, and which I'll be factoring in when I come to summarise this discussion and write it up. Your point about changes in mathematical requirements over time is well taken, and the need for better skills in identifying patterns and relationships in spatial data (including changes over time). One of the points made in my article was about the number of fields today in which such knowledge might play a significant role. And…

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Thank you for this response Colin, which I find interesting and thought-provoking, and which I'll be factoring in when I come to summarise this discussion and write it up. Your point about changes in mathematical requirements over time is well taken, and the need for better skills in identifying patterns and relationships in spatial data (including changes over time). One of the points made in my article was about the number of fields today in which such knowledge might play a significant role. And I totally agree that we shouldn't be removing algebra or trigonometry from the school maths curriculum to make way for such knowledge. It's not a matter of either/or, but both/and.

Identification of the attributes of situational awareness is also an excellent idea, and I wouldn't be surprised is there isn't already some research happening in this area, although I haven't come across it, personally.

In addition, there are also undoubtedly cultural factors and other aspects of situational awareness to be factored in. At the crudest level, the situational awareness of people living in cities obviously needs to differ from those living lifelong in a wide expanse of desert.

The Frenchman Gaston Bachelard wrote a book La Poétique d'Espace (1958) translated into English as The Poetics of Space, in which he wrote "Inhabited space transcends geometrical space". In this book he discusses what could be broadly termed the metaphorical use of space, from a 'western' perspective - ie from the perspective of those brought up in houses. In this book, he speculates on, inter alia, why adults brought up in houses with several storeys invariably recall childhood cellars from the top looking down, but recall attic stairs from the top looking up. My interpretation of this is that it is probably a product of deep conditioning into concepts of 'up' and 'down', resulting from socialisation that begins when people are so young that it is a virtually automatic response. But clearly, it's not the only way to conceptualise a house...

Finally, I must agree with you that situational awareness encapsulates spatial awareness, not the other way around, but it would be good to hear more from you on this.

Anyhow, thank you again for your post. It has given me a lot to think with, and I'll look forward to a possible response from you in which you perhaps write a little more about the possible attributes of 'situational awareness'.

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

One more anecdote regarding how Warlpiri spacial thinking can manifest itself.   
When we carried out a soil geochemical survey we took an old man with us to avoid areas of cultural sensitivity. A little bit akin to applying for a planning authority permit.   
We were taking soil samples along south-north lines every 250metres. The lines were one kilometre apart. We covered a hilly area of sub-cropping metamorphic rocks. To the south of the survey area there was a diagonal range which was a no-go area…

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We were taking soil samples along south-north lines every 250metres. The lines were one kilometre apart. We covered a hilly area of sub-cropping metamorphic rocks. To the south of the survey area there was a diagonal range which was a no-go area. We were using a compass and a 'hip chain' (this was in pre-GPS times). A hip-chain is a devise were a cotton string is 'played out' that turns a counter. They are surprisingly accurate.   
On each line the old man would tell us when to stop sampling as we approached the range.   
On one line I asked "Is this far enough?" The old man said "one more" and paced ahead to the next sample point. He then pointed west to the previous line and said "now we are level".   
He'd stopped exactly 250 metres exactly due south from the previous sample.   
You can have semantic and pedantic arguments whether this is mathematical thinking or some genetically inherited primitive instinct. Whether that sort of thinking has a place in scholastic curricula, and if so how can you implement it. Whether there is a place in the competitive Global economy for such 'mind-space'. Whether this kind of thinking is "holding back" Aborigines from a "successful" future.   
Call me simple, I was just impressed by the old man and considered him a friend that I held in high regard.   
The thought of telling him that he should change his ways didn't occur to me.

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Farmer

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189743)

One really need look no further than the current explosion of art Frank - particularly the Central Desert dotty stuff from out your way - and it's more sophisticated innovators such as the wonderful mind-altering Emily Kame Kngwarreye. Like the Central Mapping Authority has been invaded by Jackson Pollock.

I had the great - if difficult - delight of having an old lady from up around Tea Tree explaining her yam painting I'd just bought. Bit like having a conversation with a wheezing cement mixer…

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I had the great - if difficult - delight of having an old lady from up around Tea Tree explaining her yam painting I'd just bought. Bit like having a conversation with a wheezing cement mixer really to my untrained ear ... but over an hour she explained the campsites, the stories (some at least), the yams and where they grew and when they were good and of times they went there when she was a girl and she'd giggle.

Part map, part aerial photograph, part history and law, part lore and story, part personal anecdote woven in, social relationships, places to camp, circuits to walk and burn, good tucker sites, water... an amazingly complex multi-layered document.

I reckon these guys are well in front of us when it comes to handling complex spatial data like GIS systems myself ... been at it for yonks.

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189743)

Great anecdote, Frank. If you have any more exemplars relating to this topic, please keep them coming in because they'll all go into the eventual written article.

My feeling is that this aptitude should not be written off as genetic endowment, but rather be recognised as having the status of 'mathematics'. To call what 'we' do 'maths', but what 'they' do as an unearned gift delivered at birth, seems unfairly ethnocentric and also, a tad hypocritical.

There's a converse side to this as well…

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There's a converse side to this as well: when Warlpiri people come to visit me in Adelaide, more than one Warlpiri person has been amazed by how quickly I can add up, subtract, multiply etc in my head (when we go shopping etc).

But this isn't any more an innate gift on my part (and the rapid-fire application of this stuff can be equated to the Warlpiri facility with the cardinal directions, which most Warlpiri have the ability to apply in a flash, seemingly no matter where they are, inside or outside). In my case the ability with number is really nothing special in terms of our cultural norms, pretty average really, but rather it is a product of all those hours and hours spent in primary school, doing what were at that time known as 'mentals' - ie mental arithmetic. And 'mentals' was in retrospect an apt name for these drills, because they become deeply ingrained in one's cognitive framework.

In both cases, and it's a point that I've made before, but I think worthy of making again, these apparent 'gifts' are the result of cultural expectations and norms and delivered via processes of education - and are the result of 'deep' learning, that's internalised and can be applied so quickly that it seems miraculous to those whose cultural norms differ. But having said that, within any culture there are individuals who particularly shine/excel at some things - maybe akin to the old man in your story?

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**Geoffrey Harold Sherrington**

Boss

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189743)

Frank,   
One time in Arnhem Land, the official map endorsed by Canberra had a "no-go sacred" site. When I asked Big Bill about this, he laughed and said it was just a place where it was easy to hunt for flying foxes. Give him a pencil and he'd change it, there were many such places.   
This is a non-trivial example. It goes to the point of how not only the stories, but also cultural matters like painting and trendy language expressions have been altered by whitey versions of correctness. There is not…

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This is a non-trivial example. It goes to the point of how not only the stories, but also cultural matters like painting and trendy language expressions have been altered by whitey versions of correctness. There is not much in common with say pre- 1920 art and post-. It's not uncommon for the locals to want to be obliging and deliver what they think you are seeking.   
IMHumbleO, the greatest damage and that which will take the longest to repair has been to stress and make official records of differences, even laws, when the now-passed aim should have been mutual learning and familiarisation with similarities.   
In my lifetime of interaction that started at age 5 at school, differences do not remain in my memories. In my career phase, we got along fine from the start of the 1970s, then it started to turn rotten as heaps of theorists and zealots, often from Canberra, stuck their noses in with more rules and regs, ones that were often disruptively harmful and continue to be so.   
Some in the NT are old enough and close enough to remember that the do-gooder equal pay for stockmen was a major mistake, effectively depriving the locals of much employment, of which they were rightfully proud. They were, as a group, excellent at their work, then there was nearly none.Time alone would have made the equitable adjustment.   
I write here with mixed feelings because it's so hard to avoid the 'we' and 'they' when that is what should never have been emphasised in history - yet here I am adding to it.   
For heaven's sake, reduce the present emphasis on the reporting of this few small % of Aussies. And repeal all laws based on 'race'. Now.

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Geoffrey Harold Sherrington](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189896)

Geoffrey, "the us and them" paradigm is indeed very hard to avoid. It is also nigh impossible to be entirely devoid of ethnocentricity. It is when ethnocentricity slides into ignorance driven xenophobia that a lot of damage is done.   
I agree that equal pay for stockmen was a mistake, if not in principle, certainly in its execution.   
There is a lot of truth in "the road to hell is paved with good intentions".   
With the exception of those odd-ball denialists, it is also now widely accepted that the…

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There is a lot of truth in "the road to hell is paved with good intentions".   
With the exception of those odd-ball denialists, it is also now widely accepted that the 'Stolen Generations' was a grave injustice and a mistake.   
I have no doubt that the Intervention and its sequel Stronger Futures will in the future come to be recognised as grave injustices and mistakes.   
When it comes to my anecdotes, there is the danger that they be seen in a "Ripley's believe it or not" gee whiz aren't the natives fascinating light.   
Not at all my intention. Remote Aboriginal Australians have had a terrible bad press in recent times. They have been demonised, stereotyped, stigmatized, disempowered etc.   
Here in Yuendumu (that has been depicted in newspapers as a dysfunctional dangerous rioting place) the "us and them" paradigm (that unavoidably has always existed) has got worse than ever in my memory. I hope the anecdotes go some way to show that the Warlpiri are an intelligent bunch that happen to see the world through different (to ours) eyes and that they have every right to do so. The Warlpiri have much enriched my life. I owe it to them to do my bit at countering the lies and propaganda and misconceptions that they are subjected to.   
Repealing the race based laws- many of which are alleged to be derived from good intentions- is not a bad idea.

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[**Stef Rozitis**](http://theconversation.com/profiles/stef-rozitis-99346)

logged in via Facebook

This is very interesting, but as you point out a challenge to white teachers who may know very little about Indigenous knowledge. Do you know if anyone is running professional development in this area? Because to make something main-stream a lot of people need to know it very well!

If someone who knew about this picked it up and developed it now, it could become the way things are done, otherwise it will just all turn out to be lip-service

3 months ago [report](http://theconversation.com/comments/189954/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Stef Rozitis](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189954)

Stef, you are 100% right about this need for professional development/inservice in the area, and it's what needs to happen if these aspects of the national curriculum are genuinely going to be implemented. Not knowing which state you live in, it's hard to know how to advise you on this, but if you're in the public school system I would start by getting in touch with the Education Department, or if in the Independent system, but getting in touch with the specific local authority, be that Catholic Ed. or other relevant education body.That way such thinking can be developed and incorporated into the curricula of the future, and as you say, become the way things are done.

But it WILL also, as you say, wither on the vine if it's simply left as it is.

Please post again if you have some success with carrying this forward in your own region, and thank you for your post.

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**David Thompson**

Marketing Research

In reply to [Stef Rozitis](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_189954)

Interesting that you assume all Australian teachers are white. I am more worried about white teachers who know little of mathematics, science, and English literacy.

3 months ago [report](http://theconversation.com/comments/190754/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190754)

David: with the greatest respect, there you go again!

To write that including such perspectives may present a challenge to white teachers is NOT, by any means, tantamount to the assumption that "all all Australian teachers are white".

It's important in this kind of discussion not to attribute comments and ideas to people unless they have advanced those specific ideas/comments.

3 months ago [report](http://theconversation.com/comments/190761/abuses/new)

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[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190761)

Do not be dissuaded or distracted by David's heckling Ms N. No real interest in the issues or in a solution. Or even in exploring same.

I have this curious notion Ms N ... about teaching - or more precisely, about learning. And that really everything we learn we learn for ourselves, we permit ourselves to keep. That the only thing we really learn from our teachers - or more precisely initially learn from our teachers - is enthusiasm... curiosity and interest. But once you've got that sparked…

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I have this curious notion Ms N ... about teaching - or more precisely, about learning. And that really everything we learn we learn for ourselves, we permit ourselves to keep. That the only thing we really learn from our teachers - or more precisely initially learn from our teachers - is enthusiasm... curiosity and interest. But once you've got that sparked up the little beasts feed themselves, line up like a decent dairy herd at dusk.

The only thing we learn faster is a lack of enthusiasm or of anything beyond drudgery and rote. Dispirited teachers are a hazard to shipping.

To that extent I'm not sure a single curriculum will actually capture what is truly necessary - enthusiastic, imaginative and observant teachers... who will try new things and look and watch before they leap in with answers ... but judging from this chat here there are a few of them about.

While you are contemplating matters curricular could I strongly recommend a bit of thought devoted to a simple subject - perhaps while those more gifted are playing footy .... an investment of a few hundred dollars at the local wreckers and a half decent mechanic/mentor/teacher or volunteer ...even the local cop if he or she is half decent. And you have the main ingredients for a useful course.

Nothing like a set of tools and the prospect of a working 4WD coinciding with turning 17 to focus the enthusiasms of a young lad. Or probably lass now as well.

Some benefits: They turn up. Often the ones who never have much. They learn things. Like how an engine works. A bit of metalwork and welding. And more. How to look after things like a car, a workshop, tools... They save themselves money in future with DIY repairs and maintenance. They can spot a good car bargain from a dodgy bomb. They learn to drive safely. They learn to drive a 4WD properly. They learn to use radios and GPS systems and EPIRBs. They learn to tell when a rattle is serious. Maybe some first aid. Just learning how to keep a car registered and roadworthy would save an immense set of early entanglements with the wallopers.

None of this is not useless knowledge by any definition. Life saving in fact and perhaps even life altering - opening up some opportunities - curiosities and enthusiasms - for a bunch of the harder to get to kids. And all useful around the place.

Do not make the mistake of attributiing some genetic or cultural predisposition to safe 4WDing to the locals I'm afraid. They might know exactly where they are, but it doesn't help if you've just rolled a few times and are sitting upside down in the Tanami Desert. The statistics are appalling. You can spot them on the news - extended families wiped out... overloaded, doing an all-nighter ...

True, learning to salvage an old wreck is not a direct walk-up start to quantum theory or mathematics of complex systems... but you never know where you'll end up when you pick up a book - even a workshop manual.

That's my tuppence worth anyway.

A very interesting subject and most enlightening chat. Many thanks.

3 months ago [report](http://theconversation.com/comments/190796/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190761)

If that is the case, Christine, then my apologies. And I look forward to the evidence of Asian, Arab, African, Hispanic teachers who do not face the same challenges as "white teachers".

3 months ago [report](http://theconversation.com/comments/190850/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190796)

Peter, yet another sparkling and inspiring contribution from your good self.   
What you say about enthusiasm is oh so true.   
What you say about mechanical nous and the local wrecking yard is also on the money.   
You may be familiar with the Bush Mechanics videos that were created here.   
Mind you these are more about the Warlpiri sense of humour that about mechanical wizardry. The clutch plate carved out of mulga wood never happened. Mind you the person (from Papunya) that had lost the little screw…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Mind you these are more about the Warlpiri sense of humour that about mechanical wizardry. The clutch plate carved out of mulga wood never happened. Mind you the person (from Papunya) that had lost the little screw that holds the contact (points) in place and stuck it on with spinifex wax to make his way home showed the genius that is parodied in the videos.   
I hate to be a wet blanked though Peter. What you speak of did to some extent happen during the era of self-determination. We had 'sunset garage' or the 'yungkurnu-kurlangu'('belonging to bones' or cemetery). These days for safety reasons (heaven forbid children playing amongst the car wrecks) the Shire calls in the scrap dealers with their car crushing equipment and our spares inventory finds it way to Korea or China to return as ready made goods with no space for local input.   
It is rather difficult to enthuse and inspire Warlpiri children when their whole social fabric is being torn and their society has been thoroughly disempowered and marginalized.   
But hey, they're a resilient lot and don't share my pessimism.

3 months ago [report](http://theconversation.com/comments/190949/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190949)

Too much welfare and not enough Mathematics, eh, Frank?

3 months ago [report](http://theconversation.com/comments/190952/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Claire Bockner**](http://theconversation.com/profiles/claire-bockner-46934)

logged in via email @bigpond.com

Very interesting article, Christine, reminds me of a program I heard on Radio National last summer, about Language and Indigenous spacial cognition:

<http://www.abc.net.au/radionational/programs/allinthemind/how-language-shapes-thought/4329212>

3 months ago [report](http://theconversation.com/comments/190283/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Claire Bockner](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190283)

Thank you very much Claire, especially as I missed this one at that time, and I hope that others will click onto and read this link, too.

3 months ago [report](http://theconversation.com/comments/190352/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Claire Bockner**](http://theconversation.com/profiles/claire-bockner-46934)

logged in via email @bigpond.com

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190352)

Yes, there were many points in common with your observations from Lajamanu and the ‘learned cognitive factors routinely brought into play by some Indigenous AFL players’ that you talk of, in the part of this All in the Mind broadcast ‘How Language Shapes Thought’

<http://www.abc.net.au/radionational/programs/allinthemind/how-language-shapes-thought/4329212#transcript>

dealing with spatial concepts in Indigenous communities on Cape York. In this program Lera Boroditsky, assistant professor of…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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dealing with spatial concepts in Indigenous communities on Cape York. In this program Lera Boroditsky, assistant professor of psychology at Stanford University talks about the work she has done with Alice Gaby, a linguist from Monash who has studied Kuuk Thaayorre

… a language spoken in Pormpuraaw on Cape York Peninsula and …in Kuuk Thaayorre instead of terms like left and right to organise space the Kuuk Thaayorre predominately use terms like north, south, east and west. So everything in the language is arranged in terms of these cardinal directions… An example might be you say there’s an ant on your south/west leg, or move the cup to the north/north/east a little bit and this is a completely different system from what we see anywhere else.

Their research precisely supports what you write about 'the important difference is that a person’s limbs (“left” or “right”) are not to be regarded as fixed entities in relation to self, as is implicit in the formulations “left” and “right”. Rather, they are conceived within a much broader context of spatial relationships with respect to the exterior world. So, in accordance with the specific spatial circumstance, a person might talk about one’s north, south, east or west hand (or leg).

Alice Gaby also found ‘people in Pormpuraaw who are speaking traditional languages like Kuuk Thaayorre and Wik-Mungkan are very attuned to the cardinal directions, north, south, east, west. So just to say hello to someone in Pormpuraaw you ask [Kuuk Thaayorre and Wik-Mungkan language] which roughly translates as where are you going, or where are you coming from?'   
Your quoted observations of the ‘ability, to handle sophisticated terminology about space and directionality with confidence and accuracy, and the concomitant skill in land navigation even when one is completely surrounded by desert, is inculcated into children from the earliest infancy’ since, as Boroditsky explains ‘language is a socially enforced and practised skill’ and, of course, a skill that is learned from birth onwards.

It's definitely worth reading the transcript of this program detailing research that supports what you and so many teachers in the remote community's schools have observed.

3 months ago [report](http://theconversation.com/comments/190988/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Claire Bockner](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190988)

Claire   
My 9 year old uses cardinal space (NSEW) over larger spatial terrain, left/right upclose, as well as 3-D straight/behind/above/below, as well as orient to the spatial perspective in different locations facing different ways. It seems a real shame the Warlpiri are trapped in their world, with access to only cardinal directionality. This is one reason we contribute to funds to send such kids to urban Christian boarding schools.

3 months ago [report](http://theconversation.com/comments/190997/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Claire Bockner](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190988)

Claire: thank you very much for this very clear elucidation of the major points made/ideas expressed in this broadcast. A good deal of the outline you've so thoughtfully provided does seem to accord very closely with my understandings of the subject. You've also whet my appetite for reading the radio transcript very closely - and I'm sure that the same applies to others reading your post - well, I should say those people whose interest in engaging deeply with this topic is serious...

3 months ago [report](http://theconversation.com/comments/191194/abuses/new)

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[**Claire Bockner**](http://theconversation.com/profiles/claire-bockner-46934)

logged in via email @bigpond.com

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190997)

David,

Great that your child knows the cardinal points and could therefore orientate herself in the desert.

I don't see what Christian boarding schools have to do with the subject under discussion.

3 months ago [report](http://theconversation.com/comments/192058/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Claire Bockner](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192058)

To teach the Walpiri about other dimensions of space and spatial orientation, apart fromm just cardinal directionality.

3 months ago [report](http://theconversation.com/comments/192073/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

In reply to [Claire Bockner](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192058)

Claire,   
The reference to boarding schools is that indigenous children are given the opportunity to participate in the real world. This initiative looks forward rather than back, by inclusion. Clinging to the past will hinder rather than help.

3 months ago [report](http://theconversation.com/comments/192394/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192394)

I have an indigenous grand daughter that is going to boarding school in Victoria. We are all grateful for the opportunity she is given.   
I can assure you however that when she was living out here on a remote community she and other Warlpiri children were not clinging to the past and their world was no less real than the one she is in now.

3 months ago [report](http://theconversation.com/comments/192498/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192394)

John,

Again - with the greatest respect, because I acknowledge the sincerity of your position - the terminology 'real world' is a misnomer here.

The 'real world' is comprised of many human cultures, languages, ways of thinking, ways of seeing and ways of being-in-the world. Perhaps those people who do not or can acknowledge this reality are those who are living in the past, harkening back to a time (not so long ago historically) when most people lived in small villages (etc) fairly isolated…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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So to reconceptualise the idea you present: perhaps it's that group of people who think that 'their' world is the only viable or 'real' world, and the world that everyone else should flock towards, willy nilly, are actually yesterday's people, the ones who are really tied to and living in the past, when our genuine human pluralism remains unacknowledged or even denied.

On another note, it is true that successive education authorities in the Northern Territory in particular have failed Aboriginal families and children in terms of education in the remote settlements, particularly in terms of the initial language of instruction when children enter school. It is profoundly alienating for a child to go to school and not understand a word of what's being said. And NO ONE is advocating lifelong monolingualism; one of the points of bilingual education is that it provides a pathway into the dominant culture, rather than children simply turning off school on Day One when they arrive in school, where they'll typically be taught by a first year out teacher who does not share the language of the kids in their class, and moreover has NIL in the way of ESL qualifications (and yes, there are some very good and a few ESL-qualified first year out teachers, but I doubt that parents at Mt Eliza Primary, Double Bay Primary or Burnside Primary, for example, would tolerate five decades during which the majority of teachers of the kids in their schools were first year out, on average stayed there for a year or less, and did not speak English). This is a structurally parallel situation to what routinely happens in parts of northern Australia.   
The point is that governments have a responsibility to provide decent education, in keeping with community expectations and aspirations, in such 'remote' places, and that boarding schools are not the only answer, but of course they do have a role when children are old enough and more emotionally equipped to travel so far away from home and family.   
Many people from the dominant culture hesitate to send their kids (particularly little ones) to boarding school because for the same reasons: because of the unhappiness they (correctly) fear might result; Aboriginal parents are no different. In all cases it's because they love their kids.

So the point here is that it's both naîve and a cop out to see Boarding schools as the sole quick fix-it 'solution'; there's a responsibility on the part of governments to provide children with decent schools in concert with community aspirations (and in many places of the 'remote' NT, that is bilingual education INCLUDING structured ESL lessons) no matter WHERE they live...such education provision is the norm in Australia except in a few places, and is a form of grappling with the present, and certainly nothing to do to 'clinging to the past'.

3 months ago [report](http://theconversation.com/comments/192637/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190997)

The reason some of us have emphasised cardinal directionality is that Warlpiri (and other indigenous groups) are so exceptional at it. In a different context one might discuss for instance why Russian people are so good at chess.   
It doesn't follow that the Warlpiri are trapped in a world with access only to cardinal directionality. The Warlpiri world is just as multi dimensional and fascinating as ours, and has more in common with ours than is often realised. It is just that the differences (cultural/linguistics diversity) should be celebrated and encouraged rather than disparaged and seen as a problem.   
The Warlpiri are however trapped in an ethnocentric, assimilationist, oppressive, neo colonial world, that by not seriously thinking about the sort of thing discussed in this forum, by ignoring the strengths inherent in Warlpiri culture, are denying remote Aboriginal Australians an effective education. Another form of 'Stolen Generations'.

3 months ago [report](http://theconversation.com/comments/192640/abuses/new)

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[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192637)

It's actually harder for Aboriginal families to be packing their kids off to town Christine. In many cases they are sending the kids off to somewhere they have never seen, do not feel a part of, don't understand and they fear they will in fact lose their kids.

At least we know what is involved, know the place, know the kids will be safe and will come back better and with plummy accents and good address books. Buying in is easier for us. We run the show more or less.

I reckon a large part…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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I reckon a large part of the problems arising from education in the north has been it's alien nature ... it's centralised control and remoteness. It is we who are remote as far as they are concerned.

Building solid community and parental involvement in the school is critical in ensuring that Aboriginal communities are able over time to absorb education into daily life. At the moment they just get to swallow it. There are few resources to foster such involvement and little interest from central authorities in letting a thousand flowers bloom in the bush.

So while you curriculum wallahs are (rightly) concentrating on what happens in classrooms, spare a thought for the opportunity afforded by a school to bridge here and there, now and then, and providing a focus for community organisation engaged with the Big Issues. Educates everybody.

Keep swinging!

3 months ago [report](http://theconversation.com/comments/192699/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192699)

You're quite right about its being much harder for Aboriginal families to send their children off to boarding schools, Peter. It can also be extremely hard on the kids themselves.

I worked at the other major Warlpiri school (Yuendumu School being the other largish Warlpiri school, but there are other smaller Warlpiri schools, too) - Lajamanu School to the north of Yuendumu on the northernmost fringe of the Tanami Desert, for 10+ years from the early 1980s and into the following decade, for most…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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By the late 1980s I had placed almost 70 secondary age students in Boarding schools all over Australia - two private schools in Alice Springs; two in Darwin, on public and one private Christian school; & a private Christian school in Queensland. In all cases at least some of the staff there were very good; but a significant minority in each case held deficit views about Aboriginal people, their culture, and the kids clearly picked up on this.

The reason for sending the kids away to school was that there was ABSOLUTELY no secondary education facilities provided where the kids live, although in non-Indigenous townships with similar populations there were high schools in situ.

At that time there was no telephone at Lajamanu, just 3 radio telephones to service the population of almost 800 people. These were reserved for special purposes - health etc. It was almost impossible to make or receive private calls on these two way radios. So parents and children could not contact each other, school term about, and neither party usually had any idea of what was happening at the other end, unless an older family member passed away and a call was placed to the school.

At the schools, most of the staff were caring and decent, but not necessarily so in the boarding houses themselves, where in some cases the 'house parents' held certain attitudes towards their charges. In one instance, the Aboriginal boys (and only the Aboriginal boys) were told to put stick deodorant on their feet before playing sport, and supervised in doing so.

A number of the schools banned parents and family from visiting their kids.

The homesickness was shocking.

This is on record in my testimony to the Aboriginal Deaths in Custody, to which I was called as an expert witness.

Even so the boarding school option was something that many of the kids stuck to, and where they did quite well academically, until the government decided to pull the plug on Abstudy, which funded those kids to go away to school, so it stopped almost altogether for a while.

It isn't quite as extreme as this today, thanks heavens, but pretty much the same issues you flag in your post Peter remain the same today. So, as is the case with small country high schools in country towns, there needs to be a half-way decent government school option in the larger communities at least. There are some schools nominally called 'high schools' on the larger Aboriginal settlements, but they are Clayton's high schools, with almost no real subject choice and they really don't measure up to other Australian high schools found elsewhere.

This is not 'off-topic' because it serves to explain why it is very difficult for some Indigenous kids to succeed, despite their very real academic competence, in some areas particularly. And it also demonstrates the need to incorporate certain approaches into the curriculum that, as Brian Wicks said, will play to their strengths.

And yes, I'm on record as agreeing that we need to effect structural change, not just look at & review the curricula. But the curriculum is ONE important strand in an approach that involves working on multiple fronts, including chipping away at continuing 'deficit' views of people's abilities, which can have inordinately negative effects when people begin to internalise these views...

3 months ago [report](http://theconversation.com/comments/192946/abuses/new)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192946)

Yes it's bad enough to be told you can't do things but the really tragedy is when you start to believe it. All becomes a self-fulfilling prophecy really.

And some teachers actually teach this I'm afraid... intentionally or not.

I wonder if the deodorant helped the lads run better or something. How odd a notion.

3 months ago [report](http://theconversation.com/comments/193003/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193003)

Peter a propos that real tragedy ("when they start to believe it"):   
Am told that there is ample research (worldwide) that societies that are disempowered end up behaving the way they are expected to by those that are controlling them. The history of the British Raj in India comes to mind.   
An example of this is that Yuendumu people often tell visiting bureaucrats and politicians that what they want most are jobs, whereas what they really want is to be allowed to run their own lives (the jobs come…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Peter a propos that real tragedy ("when they start to believe it"):   
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An example of this is that Yuendumu people often tell visiting bureaucrats and politicians that what they want most are jobs, whereas what they really want is to be allowed to run their own lives (the jobs come after- provided these jobs exist at all)..... oops, have I opened a Pandora's box of self righteous ethnocentric "they should work and pay taxes like the rest of us" comments?

Yet another example of how tricky cross cultural communication can be:

Long before telephones and internet a school teacher at a Sydney primary school arranged an exchange between her class and my wife's ESL class at Yuendumu. The Warlpiri kids made drawings and wrote stories about what they had done on the week-end. "I went hunting with my aunty and she killed four goannas..." "My father took me hunting and he shot five kangaroos" (This was before Port Arthur when most Warlpiri men had a rifle). In short the kids' families had perpetrated a veritable massacre of wildlife! Off this went in the mail. A few weeks later came the response: "It is wrong to kill animals" "You should think about the environment" "Kangaroos are our national emblem" etc.

It did leave us wondering where those Sydney kids thought the meat in their supermarket came from.

3 months ago [report](http://theconversation.com/comments/193056/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193003)

Hello Peter!

You're right about teachers 'teaching this', albeit not directly, usually, but more often by evincing via their attitudes towards kids (and others) their not-so-undisclosed inner thoughts on these matters.

Regarding the matter of the antipodean (i.e. deodorant use on feet) - yes, v. v. strange indeed, but unfortunately not as benign as you've suggested (or perhaps all sports people would use it for performance enhancement and not have to use EP 47 or AK 22 or whatever it is that people are using to heighten their performances - memo to relevant sports).

And for the rest of us, of course - naturally, even genetically - we smell just as sweet straight after extreme exertion as immediately before - and the Pope's \*\*\*\*doesn't stink\*\* - if you'll pardon the dysphemism - it's certainly not French! (cross to Monte Python clip).

Humans can be self-deluding, and illogical...but this gives rise to serious discrimination and truncated lives, as you understand...

3 months ago [report](http://theconversation.com/comments/193058/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193058)

Christine and Peter,   
Surely sometime in your life you have put deodorant on your feet and run like the clappers!   
Wonder what deodorant Kathy Freeman used at the Olympics?   
Christine, looks like you were wrong all along. All this discussion regarding Warlpiri footy skills, mathematics, curricula, spacial and directional skills and concepts, language, learning etc. and it turns out that the secret lies in how they apply deodorant!

3 months ago [report](http://theconversation.com/comments/193064/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193056)

I had a similar tale from a young mate who grew up with his grandmother out around Bourke in NSW. He would take his sandwiches to school - great huge door stop slabs of things they were - he'd swap them for the devon and sauce on bought bread with the crusts cut off. The white kids really liked his roast pork sandwiches. They might have been less impressed if they'd known it was roasted echidna... yummy by all accounts. Scurrying spiny meats. His grandma was apparently very good at them…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Strange how particular animals are gender specific... gendered hunting ... women do goannas, lizards and stuff under the ground. - also collecting and preparing .. blokes do running meats and at least down here possums and the like. Fish were open slather but men fished with spears, women with lines. Everyone worked on the traps.

To be honest Frank I suspect that if we knew ourselves and our best interests as well as some of these folks - looking on from outside as it were - we too might opt for greater control over our lives rather than selling ourselves body and soul to chasing after stuff, doing our jobs and pursuing the material trappings of contentment. But it must be a choice - not a default sentence. An informed, educated choice.

3 months ago [report](http://theconversation.com/comments/193070/abuses/new)

* 1. In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193064)

Comment removed by moderator.

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

Throughout this thread, 'nurture vs. nature' pops up from time to time.   
Is the superior spacial consciousness of Warlpiri (and other societies) genetically inherited or is it purely a result of the circumstances of early learning. Undoubtedly 'nurture and nature' are both contributing factors, but my own experiences make me believe that early learning, language, world-view etc. are by far the greater contributor in this instance.   
Please don't interpret the following as an expression of narcissism…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Throughout this thread, 'nurture vs. nature' pops up from time to time.   
Is the superior spacial consciousness of Warlpiri (and other societies) genetically inherited or is it purely a result of the circumstances of early learning. Undoubtedly 'nurture and nature' are both contributing factors, but my own experiences make me believe that early learning, language, world-view etc. are by far the greater contributor in this instance.   
Please don't interpret the following as an expression of narcissism, I'm fully aware this isn't about me. I merely offer it as an explanation of why I reached the above conclusion.   
As a child I lived in a semi-rural town on a railway line. As a young geologist I did a stint in the Canadian Arctic Islands where I experienced 24 hour darkness and 24 hour sunlit days.   
After a long time in Warlpiri country I subconsciously added cardinal directions to my memories. As I "remembered' it the railway line emanated out of Buenos Aires in a southerly direction. When I checked it out on Google Earth, I found out that the railway line actually ran west-east. As for the sun on Ellef Ringness Island I 'remembered' it as doing a 24 hour ellipse just above the southern horizon. When somebody showed me an amazing bit of software I got to do a 24 hour 're-enactment' and to my surprise the sun hovered above the horizon and did a 360 degree circle.   
The more time I spent with Warlpiri people(especially out bush) and trying to learn the Warlpiri language (I never quite succeeded) the more my own sense of direction got honed and the more sub-conscious it became, to the extent that I feel uncomfortable when I lose my orientation and have to ascertain in which direction the cardinal points lie. A person whose mother tongue is Warlpiri never loses his or her orientation.   
For many years I was an active Amateur Radio operator here in Yuendumu. It didn't take long before I learned in which direction to point my antenna to call up people in various parts of the world, including such counter intuitive directions as 'long-path Europe' (over Antarctica).   
When I had brought a set of local air photographs (long before television) Warlpiri people that had never been in an aeroplane showed a great interest in them and took only minutes to interpret them and tell me the names of creeks and hills. Three dimensional projection in action. This in sharp contrast to the air photo sessions I attended at University.   
I've also seen young Warlpiri kids navigate Google Earth with the greatest of ease, and recognise local features and 'travel' to other communities they were familiar with.

I very much doubt that my acquired sense of direction is inherited (my siblings aren't anywhere near as good at it). I have no reason to believe that I'm the descendant of Dutch navigators.

3 months ago [report](http://theconversation.com/comments/190913/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190913)

"Is the superior spacial consciousness of Warlpiri (and other societies) genetically inherited or is it purely a result of the circumstances of early learning."   
Neither, because there is not a jot of evidence to support this claim, even after 300 posts. In fact, the evidence we do have - including dramatically inferior Mathematics results compared to j every racial/ethnic group on earth - suggests an underdeveloped/restricted spatial ability.   
Frank, as a scientist, using your own perception of your experiences is pretty weak tea. Surely, you are not already unlearning the whole scientific real of human experience which distinguishes modern mankind?

3 months ago [report](http://theconversation.com/comments/190980/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**Geoffrey Harold Sherrington**

Boss

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_190980)

Why do you persist with looking for differences? These are not specimens preserved in ethanol in Bell jars on lab shelves. They are   
People.   
Like others writing here, I've seen quick adaption to reading of air photos, but science needs double blind standards, not hearsay.

Data trumps belief. But first, estimate the benefit:cost of doing the experiments before you start.

3 months ago [report](http://theconversation.com/comments/191020/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Geoffrey Harold Sherrington](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191020)

I don't think anyone is actively 'looking for' differences, Geoffrey Harold, but cultural differences do actually exist - and these result in certain different emphases in different areas, in terms of what knowledge is socially and culturally valued within a specific culture. One of those different emphases has been discussed in this article.

And \*\*\*of course\*\*\* we're all human cultures, i.e. people. Our differences should be a matter of celebration, mutual respect and recognition, and most certainly should not based on any kind of deficit model, or sense of cultural superiority which I think that you may be getting at here.

But trying to erase those very real differences is not an option either - because that approach can actually lead to cultural/social superiority/ or deficit models. May a thousand flowers bloom!

PS quite definitely no experiments having taken place/are taking place...

3 months ago [report](http://theconversation.com/comments/191390/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**Geoffrey Harold Sherrington**

Boss

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191390)

What a mixed answer, Christine. If you do not have experiments, how do you get clean data?   
We used to experiment with mathematics in the outback. If you drank 24 cans of beer in 24 hours you qualified for membership of the carton club.   
Why all the talk about pigskins when blind Freddie can see a bigger topic with grog. Some undesirable secondary matters will persist until the solution to grog is found. My solution was to stop - in 1983.   
May a thousand Fosters bloom.

3 months ago [report](http://theconversation.com/comments/191507/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Geoffrey Harold Sherrington](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191507)

"What a mixed answer, Christine. If you do not have experiments, how do you get clean data?"   
Sightings of Biame in the constellations, and directions to the nearest bunyip.

3 months ago [report](http://theconversation.com/comments/192029/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Geoffrey Harold Sherrington](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191020)

Geoffrey, I, personally, do not hunt for 'differences'. My make-up is more to look for 'patterns' and 'associations'. But epistemological ruptures do happen; as do political, and personal experiential ruptures. And even without 'rupture' per se, gradual change/evolution can eventually reach a place where it is revolutionary compared to a previous place. And while I share some of the skepticism around the discourse of "revolution" associated with the appearance/development of natural experimental science in the 16/18th centuries, I will confidently insist on a difference between 21st century experimental physics, astronomy, chemistry, molecular biology, mathematics, and computer modelling on the one hand, and 'personal experiences' and dreamtime lore on the other.

3 months ago [report](http://theconversation.com/comments/192046/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191390)

"But trying to erase those very real differences is not an option either - because that approach can actually lead to cultural/social superiority/ or deficit models."   
Christine, those models are already ubiquitous. Without them, humanity would have no sense of progress, let alone hope, and aspiration.

3 months ago [report](http://theconversation.com/comments/192049/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Molly Gabbard**](http://theconversation.com/profiles/molly-gabbard-99517)

Artist and Art Projects Manager

Hello Christine,

Excellent article! I enjoyed your perspective. I would love to read more ellaboration on the connection between Indigenous mathematics and Indigenous art. Have you looked into other Indigenous Australian foundational ideas of ethnomathematics? Ethnomathematics being the relationship between mathematics and culture and more so mathematics that is practiced by identifiable cultural groups.

Your analysis of Aboriginal spatial abilities in AFL connects well and is represented…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Hello Christine,

Excellent article! I enjoyed your perspective. I would love to read more ellaboration on the connection between Indigenous mathematics and Indigenous art. Have you looked into other Indigenous Australian foundational ideas of ethnomathematics? Ethnomathematics being the relationship between mathematics and culture and more so mathematics that is practiced by identifiable cultural groups.

Your analysis of Aboriginal spatial abilities in AFL connects well and is represented properly by the selected image of Dorothy Napangardi's painting which I am assuming is her interpretation of an aerial view of traditional country. This aerial perspective is very commonly used in Aboriginal paintings from central Australia. But how do these artists conceive these aerial perspectives in their paintings?

I am curious how spatial abilities and ethnomathematical concepts are used in other Aboriginal regions of Australia. The subject of bark paintings of the NT normally depict a spirit, creature or object that is represented in an X-ray type view and filled with textures, shapes and patterns. Patterns are a common form of geometric ethnomathematics in indigenous cultures worldwide, which I see most immediately (to myself that is) in the artwork of Native Americans, everything from their weavings to beadwork to paintings.

3 months ago [report](http://theconversation.com/comments/191090/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Molly Gabbard](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191090)

Many thanks for this post, Molly. You’ve packed so much into it that I may need to respond to the various matters you’ve raised over several posts, owing to other pressing time commitments!

This is a general, rather than specific response to what you've raised but it will frame my more specific response later.

To begin, all cultural groups, no matter how diverse, bring their mathematical understandings into play in their artworks at some level, some more explicitly than others. In the…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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To begin, all cultural groups, no matter how diverse, bring their mathematical understandings into play in their artworks at some level, some more explicitly than others. In the so-called ‘western culture’, artists like Kandinsky, Mondrian, Vasarely, Agnes Martin, Bridget Riley, immediately come to mind.

The Russian artist (and also big on theorizing his artistic work) Kasimir Malevich (1879 – 1935) became famed for his works like Black Square, which has been described as ‘radical geometric abstraction’. Although Malevich has been described as a nihilist and creator of radically non-representational geometric shapes, links with spirituality have also been identified.

Interestingly enough, no matter what cultural group is the creator, visual art deploying mathematical understandings is frequently understood as having a spiritual underpinning.

For example, Philip Shaw, Professor of Romantic Studies in the School of English at the University of Leicester and Co-Investigator of ‘The Sublime Object: Nature, Art and Language’, writing about an exhibition at The Tate Gallery, wrote of Malevich’s Black Square that: “Kantian theory does not, however, fully account for the significance of this work. Malevich himself regarded his minimalistic geometrical forms as the secular equivalents of Russian icons, a form of painting which aspires to present the divine as pure or unmediated reality. This idea is corroborated by a comment from the diary of the artist’s friend, Varvara Stepanova, dating from 1919: ‘If we look at the square without mystical faith, as if it were a real earthy fact, then what is it?’

Shaw goes on to write:   
“There is, however, another way to understand the sacred quality of Black Square. In the course of a comparison between Malevich’s square and the readymade art of his French contemporary Marcel Duchamp, the Lacanian theorist and cultural critic Slavoj Žižek makes the following observation:   
The underlying notion of Duchamp’s elevation of an everyday common object into a work of art is that being a work of art is not an inherent property of the object. It is the artist himself who, by pre-empting the ... object and locating it in a certain place, makes it a work of art – being a work of art is not a question of ‘why’ but ‘where’.” (from Slavoj Žižek, ‘The Real of Sexual Difference’, in Slavoj Žižek, Interrogating the Real, ed. Rex Butler and Scott Stephens (London and New York: Continuum, 2005), pp. 304-27; pp. 312-13).

The important point made here is about place – where the art comes from, both in terms of physical location but also epistemologically is always important, always needs to be factored in, no matter what the specific background of the artist who makes that work.

In terms of artworks with mathematical connections, of course the Cubists also frequently broke their compositions down into their geometric components, rejecting conventions of perspective etc, Put in simplistic terms, the world they had known was breaking down around them…

Islamic art might be regarded as the geometric pattern-based art par excellence, particularly so in terms of its prohibition of figurative depictions.

In this respect, geometric shapes in both ‘western’ art and Islamic art have been thought of as that connect, on a visual level, art to science, & maths, and ultimately, to spirituality.

The Aboriginal art of the Central and Western deserts could be described as being founded on a form of ‘grounded abstraction’, that is, abstraction founded upon the earth (people’s ‘country’) itself. As you rightly state, the late Dorothy Napangardi was a celebrated exponent of a style that really reflected Central and Western Desert people’s deep knowledge of spatial relationships – see this link for some discussion of this matter:

[www.smh.com.au/.../not-even-fame-is-better-than-family-20130628-2p2np](http://www.smh.com.au/.../not-even-fame-is-better-than-family-20130628-2p2np)...

and I’ll provide you with some more in-depth references later, and also respond to some of your other points later on…to be continued…

PS Please note that the senior members of the late Napangardi’s family have authorised the use of her full name.

3 months ago [report](http://theconversation.com/comments/192038/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Molly Gabbard](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191090)

Hi Molly:

this is the second of my three-part response to your post, and here I'll discuss the concept of 'ethnomathematics'. I suppose that a number of people who've read this article would view its subject matter, in part at least, as being 'ethnomathematics'. One of the most informed respondents on this site, Peter Ormonde has used the terminology, and of course, you.

As you say, the broadest definition of ethnomathematics is that it concerns itself with the relationship/s between maths…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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As you say, the broadest definition of ethnomathematics is that it concerns itself with the relationship/s between maths and culture, but it's the second part of your definition that I'd like to focus on to a greater extent: the matter of who practises ethnomathematics. There is a school of thought that the concept arose as a response to the eurocentrism of maths and maths education, which is fair enough, but it seems to me that the term is pretty well exclusively used in relation to the maths practised by minority or colonised groups, which has by and large become marginalised as a result of their various colonial histories.

Hence I'd like to draw your attention to some of the critiques of 'ethnomathematics', such as the writings of Renuka Vithal and Ole Skovsmose, which have been published in articles as well as in a book. Here's the abstract from their article   
THE END OF INNOCENCE:  A CRITIQUE OF ‘ETHNOMATHEMATICS’:

"The first strand challenges the traditional history of mathematics. Historians of mathematics are criticised, firstly, for ignoring, devaluing, distorting or marginalising the contributions of cultures outside Europe to that body of knowledge that is paradoxically referred to as ‘Western’ mathematics. China, India, North Africa and the Arab World are recognised not only for their contribution to this mathematics but also in their own right as each having a mathematical history (see for e.g. Joseph, 1991). Secondly, only marginal attention, if any at all, is paid to the history of mathematics in cultures that have not directly contributed to ‘Western’ mathematics such as the American Indians (see for e.g. Closs, 1986) and sub-Saharan Africans (see for e.g. Zaslavsky, 1973; Gerdes, 1991a). This challenge has led to the consideration of histories of mathematics."

Now, to go ahead and more or less argue against my own preceding argument, which has involved problematising the very concept of 'ethnomaths'...

I don't have any problem whatsoever with the concept of 'ethnomathematics' so long as the practices of all mathematical cultures, including the maths practices our so-called 'mainstream' cultural group, are labelled as 'ethnomathematics'. To understand the cultures of others first one needs to understand one's own. This has been something that I have been grappling with in relation to some respondents to this article (not you!!) who insist that the only 'real' maths is founded on number - arithmetic. But 'our' maths is just as much 'ethnomaths' as that of Australian Aboriginal people, Native Americans, and so on.   
There is an excellent article in this week's Guardian Weekly (26.07.13) titled 'Algorithms - how they rule the world', written by Leo Hickman, which is well worth reading. This article reveals a good deal about our contemporary social system, characterised by high levels of surveillance, commercial interests, consumerism, and more, and it demonstrates the deeply imbricated nature of all of these strands - which are underpinned by ubiquitous algorithms, used by governments, business etc.

My point here, is that if this isn't 'ethnomaths', what is?

Population-wise the so-called 'west' outstrips small communities of Indigenous people around the world, but I think that it's important to grasp that 'our' maths is no less 'ethnomaths' than theirs.

I'm certainly not suggesting that you do not understand this! But the reason for this post is to highlight the need for a comparative approach in this pursuit, which is also why I began by discussing the mathematically-based artworks of European artists, as well as looking at the works of Indigenous artists - I think that it is only by understanding our own cultural practices that it's possible to identify the very real differences of approach of others.

For too long 'the west' has understood its (mathematical) practices as constituting the 'default position', rather than just one approach among the many possible.

This long post prepares the way for one more response from me, in a couple of days' time probably - in the meantime, you might like to respond to this one. As you can see your post has generated a lot of thought on my part!

3 months ago [report](http://theconversation.com/comments/193300/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193300)

problematising!!!!????? Is that making a problem out of something? People should be fined or even gaoled for words like that!

a shockingly mangled word.... up or down there with incentivise, envisioning, privatise and all those other dollops of consultant-speak that demean meaning. I am appalled and aghast. My gob is smacked.

Back to the business at hand... Ms N - please don't saddle me with some eurocentreric arithmetical anthropologism... I just remembered the word and tracked down a thing…

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Back to the business at hand... Ms N - please don't saddle me with some eurocentreric arithmetical anthropologism... I just remembered the word and tracked down a thing I read years ago. I'm only an innocent bystander - a recovering economist trying to broaden his shrinking horizons and living one day at a time.

I reckon your quotes above are dead right... that like language - mathematics flows about like genes throughout our history - washes between East and West, carried about like bugs, parasites and innovations and blue eyes. Except here. Not much washed in or out of here.

I reckon what we have here is a "black swan" moment in mathematics... we are talking about a set of concepts and understandings that have grown out of a completely separate and unique way of interacting with the world... untouched by Indian, Arab or Chinese numbers and such notions as wheels, domesticated animals, normal agriculture and our notions of technology and progress.

A Gulliver's Travels sort of place this isn't it?

3 months ago [report](http://theconversation.com/comments/193352/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193352)

That's a fair cop Peter - yes, that word is a shocker! I must have been having a 'junior moment', as I normally eschew such lingo, but there's so much of it about on a daily basis one occasionally succumbs (the one that I most detest is the fave. corporate board-speak of 'leveraging' something or someone, which really just means prising their $$$ out of them to the max., as far as I can make out).

On a more serious note, having taken that one on the chin, I wasn't having a 'go' or crack at either…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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On a more serious note, having taken that one on the chin, I wasn't having a 'go' or crack at either you or Molly - in both cases your posts have been spot-on, and great to think with...and I have learned a good deal from many of those involved in this discussion, including from your good self (although not quite so much from the few Yahoos who've commented, since I'm following your Swiftian theme here). And even some of the comments of the latter individuals have served to advance/sharpen the focus of the discussion in some respects).

But, this is getting away from the main game.

As you've so eloquently put it, we're talking about [mathematical] 'concepts and understandings that have grown out of completely separate and unique ways of interacting with the world' here, and I do believe that these unique ways of interacting with the world mathematically need to be afforded the same validity as other mathematical systems, understandings, concepts. In 'western' cultures, the numbers certainly have it, in more than one way.

It strikes me that by \*\*\*only\*\*\*describing Indigenous mathematical understandings and concepts as 'ethnomathematics' but positioning our own as the standard non-default position of ('real') mathematics is to consign the mathematics of the former groups to a kind of conceptual ghetto, thereby detracting from the validity of such approaches. That's all I was getting at.

And by the way, I am definitely not arguing against the notion of 'ethnomathematics' per se, but just arguing for a level playing field - either describing the mathematical approaches of ALL cultures as 'ethnomathematics' - or NONE.

So I'm glad that this 'ethnomathematics' idea/concept has been brought into this conversation, which is ultimately related to the forthcoming national curricula, wherein the idea of recognising and including Indigenous knowledge has been floated, but is probably not being taken up quite as enthusiastically as one would hope...

3 months ago [report](http://theconversation.com/comments/193399/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193399)

One of the most disturbing features of watching a new government "settle in" is hearing the creeping encroachment of what Don Watson so aptly tags "weasel words" ... fed by a smorgasbord diet of dreary briefing notes and technical discussions and a free bar of bureaucratese and acronyms. Peter Garret leaps to mind. Eternal vigilance Ms N!!!

I look forward to Midnight Oil reforming - suited - and a whole swag of punchy new songs devoted to Expenditure Review Committees, Key Result Areas and Outcomes Evaluation, in the fullness of time. Buggers to rhyme though.

Back to the serious stuff... has any of this spatial awareness/conceptual framework been analysed systematically? Way out of my turf so I am not aware of any work from a psychological or pedagogical angle looking at Aboriginal sense of place. Be very interested if there is. There should be. There's another project going begging.

3 months ago [report](http://theconversation.com/comments/193443/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193399)

Somebody Watson wrote a book "Bendable Learnings" which quite likely has the word 'problematising' in it. I recommend it.   
Not all that long ago the local education services delivery agency (Yuendumu School) had what they call a 'pupil free day'. All teaching staff descended on Alice Springs to attend a workshop. Do you think they were going to discuss the Warlpiri worldview and Warlpiri language so as to better capacitate them to deliver to their clients? No Sir! The workshop was titled "Bendable Visions"

"Junior moment".... ngurrju, ngampurrpa kana.

3 months ago [report](http://theconversation.com/comments/193446/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193446)

"Bendable Visions" indeed - ha! But apart from the ungainliness of the language use (it's not exactly a euphonious appellation!) it seems that therein lies a certain truth.

"Bendable Visions" is no doubt noughties-speak for "No Core Values" - that's what the expression immediately brings to mind, no doubt accurately in this instance.

On a serious note now, your earlier point of providing a linguist to such schools who are able to deliver inservice to teachers locally - about Warlpiri language…

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On a serious note now, your earlier point of providing a linguist to such schools who are able to deliver inservice to teachers locally - about Warlpiri language and mores (as previously offered at Yuendumu School by Mary Laughren and your wife (Wendy Baarda for those who don't know) would be far more effective, and what's more, would in the longer run cheaper than sending the entire school staff to Alice Springs.

Learning more about the local culture and Warlpiri language is exactly what teachers who are posted at schools like Yuendumu need. All successful student/teacher relationships are premised on mutual respect, and that's the sine qua non of any successful learning experience, whether those involved are 5 or 50 years old.

Furthermore that approach - of linguists providing inservice to the predominantly monolingual young teachers appointed to such schools - would be a far superior means of assisting those neophyte teachers to identify the areas in which Warlpiri children are likely to have difficulty when learning English, so would be very useful for advancing ESL approaches.

I've been hoping that some education authorities might also be influenced to some extent by this article and think about the maths curriculum - the national curriculum actually offers some huge opportunities for genuinely including Indigenous knowledge in a meaningful way.

I equally hope that this isn't an expression of pathological optimism.

3 months ago [report](http://theconversation.com/comments/193510/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193443)

Regarding your final paragraph here, Peter - there are certainly quite a few individual articles and some books written on related matters, but I haven't come across anything systematised in the manner or to the degree that you suggest.

In terms of making some inroads in terms of the National Curriculum (which is still a work-in-progress) however, I honestly don't think that what's needed is necessarily another research project or book, although both would be welcome additions - it's to a much…

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In terms of making some inroads in terms of the National Curriculum (which is still a work-in-progress) however, I honestly don't think that what's needed is necessarily another research project or book, although both would be welcome additions - it's to a much greater extent a matter of some keen but most importantly, able, curriculum writers pulling together what already exists in this broad area. They’d need to be accompanied by others also working, in good faith, towards the inclusion of some of that already-existing material in the new curricula. In writing this article I was really trying to focus on small achievable goals, and in terms of 'outcomes' (is there any escaping this language? It has become entrenched!!) I'd be happy if that could happen – i.e, if that influence could be seen in parts of the national curriculum. This has been my overarching objective in writing this piece. And as I mentioned earlier, much of this knowledge could be included in a volume titled ‘Best Practice in Aboriginal Education’. It’s become fashionable to view Aboriginal education as entirely dysfunctional but in terms of past initiatives that is most definitely not the case, and the drawing together of that best practice seems to me to be a matter of considerable urgency.

There are certainly in existence some respectable bodies of knowledge arising from specific language groups/regions; Indigenous mathematical knowledge that could be brought into play relatively easily. The case of the Warlpiri has been canvassed in the course of this discussion, and there is absolutely no reason why that knowledge couldn't be pulled together and included not only for the purposes of regional inservice but also in the broader curriculum where teachers could teach ‘about’ it, rather than actually teaching it, to children elsewhere in Australia. The game of AFL seems to be one excellent potential conduit for such teaching/learning, given the code’s high profile in bush communities. Although some people have drawn attention to the fact that this is largely a male activity, especially when it comes to playing, I don’t think that matters terribly much – because more so than other football codes, AFL has a strong contingent of female followers, who know the rules, and that’s all that’s required for understanding in this instance. But of course there are also numerous other exemplars that could be deployed, incorporated into the curriculum, and discussed.

In addition, over the years there’s been a lot written about the Yolgnu maths of Arnhem Land, and that has been included in the past curricula of the Yolgnu Matha people in the Yirrkala area and beyond. I cannot see why children in cities should not learn something about these unique and different ways of thinking mathematically – and I’m not talking years of lessons here, but incorporating such knowledge into the curriculum in the same way that some teachers (such as Warren Beckwith who posted on this site earlier) are already doing in their classrooms.

This is not to say that the remainder of the 'conversation' around this broad topic has by any means been irrelevant, and it’s not irrelevant to the national curriculum either. The discussions around language use I think have been entirely relevant - for example, the earlier discussion with one of our interlocutors around the words 'Law' and ‘lore', especially and the matter of which one more accurately represents Aboriginal religion.

In practice, this means to some extent turning the anthropological gaze onto our own culture (as some people, including yourself, have already developed the capacity to do so proficiency), and looking at it differently way than the way that’s become the norm.

[To give an example here or instance, I know of one well-known world religion with a huge number of adherents, which is founded, in part, on notions of a Virgin birth and life after death. Which is it to be? Lore - or Law? To what extent does such belief stand up to scientific scrutiny? I do not ask this irreverently, or irrelevantly for that matter, and certainly intend no disrespect is intended here. It is however clear from this question that when belief systems are involved, that a particular choice of language can be infinitely more respectful than another, and we have to take into consideration the question of harmonious relationships between differing human cultures. I cite this example to demonstrate that no single human culture has an exclusive purchase on ‘pure science’ versus deeply held belief. It is much easier, and lazier really, to recognise what is essentially magical thinking in the cultures of others, than in one’s own!]

I'm making the same point here that I have done in relation to the use of the word 'ethnomathematics'. Even though we've made light of it in places, the choices in language use are always important. As Rosencrantz said in Tom Stoppard’s play Rosencrantz and Guildenstern are Dead, “Consistency is all I ask!”

None of this is anything that needs to be explained to you Peter!

But I’m hoping that it will generate just a little more comment on what belongs in the national curriculum, before calling it a day on this discussion (which will happen fairly soon!)

3 months ago [report](http://theconversation.com/comments/193681/abuses/new)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193681)

A few years back SBS carried a weekly TV broadcast of an wonderful Koori/National NRL competition held up on the NSW North Coast somewhere. I used to watch it with my son after he finished school... went on for weeks.

Funniest thing I've ever seen. All these lanky Warlpiri fellas and similar from all over the place - all AFL hotshots - who might have seen a league game on TV once or twice - having a go at playing this alien rugby league business. Kept the refs busy I can tell you. Very…

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But the best bit by far was the ongoing women's comp. No messing about... serious biff ... there were these two sisters - I think they were playing for Redfern - frizzy teased frenzy of hair, well over 6 foot and built like D9 bulldozers - my god! Terrifying. They left piles of collateral damage - mangled piles of torsos - as they drove the opposition scrum into the ground screaming all the while. I was sitting on the lounge and I wanted to run away.

Then there was a woman playing out on the wing who every time she got the ball would take off like a gazelle - one of the most beautiful natural running styles I've ever seen - head up, straight backed, shoulders moving in a dead level line, effortless and magnificent... made Cathy Freeman look awkward. I hope someone was watching and has snapped her up for serious training.

Point is, Ms N, don't underestimate the capacity of the local gals to mix it up on a footy field given the chance. Just need the encouragement. I'll see if the gals from Redfern are available.

As I mentioned I looked a bit at Yolnu economics twenty or so years back, plus a bit on Tiwi commercial culture ... and some huge broad brush stuff on trading routes and songlines. But part of the attraction of such studies was that there was a tinge of similarity - a whiff of something we could understand... these comfortingly "foreign notions" of trade and commerce and money... The rest of it - move on folks... nothing to see here ... just some basic grunt level bartering going on albeit over thousands of miles - no maths, no science, no physics or double entry accounting.... nothing of interest.

Probably not true actually. I did a bit of work on pitjuri a while back ... you may recall that our Leader in Waiting - Tony Abbott - went AWOL in the wilderness on quad bikes searching for pitjuri with some local lads a while back out in Warlpiri country or nearby.

Pitjuri is a native chewing tobacco of a sort - a horrendous cocktail of nicotine, nor-nicotine and a swag of alkaloids of unknown activity. Mix it with ash, put a ball in your cheek and off you go. It is regarded as Aboriginal marching powder by enthusiasts, enabling the user to walk for days without food or water by all accounts. A local version of EPO Tony?

Now the best gear by far comes from out around Birdsville - nasty bleak unforgiving place to live, only made viable by the national trade in Birdsville's Best Buds. They were exported all over the country in small tightly woven rude-shaped things - so tightly made they were virtually waterproof. Like a trademark. These little bags turn up in WA, and in Victoria, all over the place. They are often quite ancient. And it was worth the while of the Birdsville locals to remain - harvesting their crop and trading - long after the place had ceased to be really viable climatically and ecologically.

I am not a curriculum builder - nor was I meant to be - but I have seen the effects - good and bad - of our efforts at providing education and other fundamental things to Aboriginal communities. Some of these efforts have been fantastic and inspirational. Others have been dismal and even counterproductive rather than just ineffectual. And even when we get things right - we shut it down - because it's working and therefore could be dangerous (!???)

Were it me charged with such a challenging task - I'd be looking closely at what you think our education is designed to do in this context - or in a range of contexts perhaps. "Our education"??? Yes, in part it is us being educated here, but also we are selling "our product" - our learning - our criteria. Have I just problematised something? See I've been practising.

Being a refugee economist I'd be looking at these issues from a rather different perspective. Id be looking at this from the point of what sort of teaching and teacher do you see being able to do this challenging work successfully - to encourage them to see it as a "cultural exchange program" in reality - to set out to learn as much if not more than he or she teaches. And to use that growing understanding to inform and fine tune the teaching and education program over time. And feed it back in somewhere to a NBN based chook feeder for teachers in the bush.

Would also be handy to be able to identify what is needed in the local community and to be able to design subjects and activities to suit. Based on what the kids will be interested in, what will be useful, what they are good at, what they are bad at (and why) ... an approach to analysing a community and selecting from a flexible palette of options. Maybe some sort of support service that helps them do this.

Also how to build P&C's and engage the locals... who to talk to, who to involve, how to step back, .... A Guide Book for Adventure Teaching... but all based on a couple of central concepts. Not the least of which being that teachers can transform the future... it's what they do.

Big job. We're watching.

3 months ago [report](http://theconversation.com/comments/193716/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193716)

Erratum: The Alice Springs 'workshop' wasn't titled 'Bendable Visions' but my wife thinks it was 'Visible Learnings". Never mind, the point I was making (and fully grasped by Christine) remains valid. I suppose the corollary of 'Visible Learnings' is 'Invisible Learnings' which brings to mind 'Hidden Agenda' A friend of mine was asked by a Warlpiri man "What is a hidden agenda?". My friend couldn't explain it.   
And yes Peter the 'somebody Watson' that authored 'Bendable Learnings' was indeed the…

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And yes Peter the 'somebody Watson' that authored 'Bendable Learnings' was indeed the Don Watson you referred to ("weasel words").   
You seem at least to have read some of the same books as I. If you haven't, and I haven't already mentioned it, 'The Other Side of Eden' is a great read that deals with differing mind-spaces (Hunter gatherers and 'us').   
As for your self description as 'refugee economist' it has made me realise I could describe myself as a refugee geologist. From a bright eyed bushy tailed young man that loved rocks and the search for minerals and got an even bigger buzz when combining the latter with mutual interaction with Warlpiri friends and neighbours, I've got rather cynical and question a situation that allows a tiny minority to not just get a slice of the cake, but to own the whole cake outright, leaving only crumbs for the rest of us, and the smallest crumbs to the people that at one stage owned it all.   
As for curricula, like yourself I have watched and thought about what it all means, but am not an 'education service deliverer' by any means. As I see it education could play a fundamental role in Closing the Gap (sorry about that!) and I don't mean the ethnocentrically defined gap of political opportunism. I mean the mutual respect gap, the mutual understanding gap. If education delivers the gift of literacy and numeracy and inspires and enriches peoples lives as well, that is a bonus.

3 months ago [report](http://theconversation.com/comments/193821/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193716)

The really sad, nay tragic, aspect of this Peter (tragic in the true sense of that word - not the media-mangled weasel usage whereby \*\*\*not\*\*\* winning an Olympic gold medal has been described as 'tragic'), is that many of the ideas that you've mentioned towards the end of your post HAVE actually been tried in the past and in an impressively large number of cases they have really worked well and been successful, no matter what criteria of success are applied. For example, the idea of having input…

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Many of those previously committed and very able Aboriginal people who were in the past working in close concert with their own children's education, are now feeling almost entirely alienated from these processes, and extremely despondent too, to which I'm sure that Frank will also attest. The 'support service' should actually be, in theory as well as practice, the local Education dept/authority, but the present (ad hoc) approaches seem to be doomed as they are largely or indeed, almost entirely, cutting local Indigenous people out of the most important educational decision making processes (to which Frank's post about the 'Visible Learnings', whereby the non-Indigenous teachers at Yuendumu were, monty pythonesquely, relocated 300 kilometres away from the Yuendumu community to Alice Springs for an inservice which had nil focus on Warlpiri language, culture, or Warlpiri ways of seeing and being in the world). Perhaps this staff development should have been called 'Invisible Yapa' ('Yapa' being the self-referential term by which Warlpiri describe themselves).

Such approaches constitute a sure-fire recipe for the continuing failure of service delivery, a failure that comes at a real human cost - that of blaming the victim for what is continuing systemic failure on the part of the so-called 'service providers'...

So yes, as you say - dismal, counterproductive and ineffectual. And needs urgent attention.

But I do believe that the national curricula may possibly offer a glimmer of hope here - as I believe that there are some very good, committed people working on these documents, who are prepared to listen...

3 months ago [report](http://theconversation.com/comments/194138/abuses/new)

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[**Molly Gabbard**](http://theconversation.com/profiles/molly-gabbard-99517)

Artist and Art Projects Manager

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192038)

Thank you for all the information. I have spent the last week delving into and familiarizing myself with these artists a bit more and their ideas. Lot's too review and wrap around.

The connection between art to science, math and onward to spirituality immediately reminds me of the Egyptians, Mesopotamians and again Native Americans. The aforementioned 'western artists' conveyed their obsession, faith and spirituality through their art that doubled as their scientific/mathematic experimentation…

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The connection between art to science, math and onward to spirituality immediately reminds me of the Egyptians, Mesopotamians and again Native Americans. The aforementioned 'western artists' conveyed their obsession, faith and spirituality through their art that doubled as their scientific/mathematic experimentation. And yes, I see how they had to grasp and have their faith in their creative expression (often conveyed through geometrics) as it was the only thing they could truly control.

I'm now curious as to whether contemporary art, that of westerner's and indigenous culture, conveys the strong level of innate/intuitive mathematics as their predecessors. Have we lost that intuitive passion and faith as time goes by? This is a loaded question which should be saved for another time...

...however, contemporary artists that I believe convey and define that godly obsession with their work, processes and boundaries with mathematical influences are Tara Donovan, Anish Kapoor and Elizabeth Turk.

The magnitude of the sculptures Kapoor creates that engage the greater space of metros and countrysides are comparable to the pyramids questioning the existence or identity of the viewers in this world. What is the higher power?

On a grander scale of repetition Donovan exercises her obsession with repetitious material to create a grand form familiar of the skies above. Could this be similar to that of repetitious and abstract patterns even in the dot paintings of central Australia? What would happen if an Aboriginal painter, such as Napangardi had worked in a 3-dimensional material of abundance? I'm not saying their should be an intervention whatsoever - I only mean to compare their obsessions of textural repetition in 2D and 3D.

I'll write more soon as I do not want to ramble and I'll give you a chance to digest my comments. I may be getting off topic.

3 months ago [report](http://theconversation.com/comments/195510/abuses/new)

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[**Eleonore WIldburger**](http://theconversation.com/profiles/eleonore-wildburger-100162)

scholar

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193681)

I am a newcomer to this forum and a latecomer to his debate. But let me comment in a few lines on your brilliant article, Christine.

I’d like to take up the ethnomaths strand in this discussion. I wholeheartedly agree that a comparative approach to mathematics, as well as to ALL subjects of the curriculum is needed when ALL Australian students are addressed. Also mainstream students can learn a lot from comparative approaches to mathematics, science, arts, and so on. I do not think the question…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

I am a newcomer to this forum and a latecomer to his debate. But let me comment in a few lines on your brilliant article, Christine.

I’d like to take up the ethnomaths strand in this discussion. I wholeheartedly agree that a comparative approach to mathematics, as well as to ALL subjects of the curriculum is needed when ALL Australian students are addressed. Also mainstream students can learn a lot from comparative approaches to mathematics, science, arts, and so on. I do not think the question of ‘western’ vs. non-‘western’ mathematics is what we should focus on; why not take the question of ‘ethnomathemics’ (on a “level playing field”!) one step further and talk about options and opportunities that are given to non-Aboriginal students, if they MUST also learn Aboriginal skills and knowledge (in the same way as Aboriginal students MUST meet mainstream curricula requirements). Therefore I propose that Aboriginal knowledge is added as a compulsory subject to the all-Australian curricula. Such an approach would hopefully improve mainstream students’ understanding for what it means NOT to be comfortably embedded in mainstream rules and regulations. Of course, I do not ignore the necessity of being able to compete with mainstream standards! On the contrary, my focus is on cross-cultural learning conditions that are equally favourable to ALL students involved – Aboriginal and non-Aboriginal.

3 months ago [report](http://theconversation.com/comments/198194/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Molly Gabbard](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_195510)

Good evening – or morning - Molly. Thanks for your very deeply considered response to mine, and you are definitely not ‘off topic’ but engaging with the issues at hand, which have equal implications for visual art deeply and at a structural level - as they do for Australian football, or more.   
Yes, I’m in agreement with you with regard to the mathematical sensibilities evinced in the visual art of contemporary artists/sculptors like Anish Kapoor et al, but would also add that it is important to note…

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Good evening – or morning - Molly. Thanks for your very deeply considered response to mine, and you are definitely not ‘off topic’ but engaging with the issues at hand, which have equal implications for visual art deeply and at a structural level - as they do for Australian football, or more.   
Yes, I’m in agreement with you with regard to the mathematical sensibilities evinced in the visual art of contemporary artists/sculptors like Anish Kapoor et al, but would also add that it is important to note that in many cases however (most? - even all (?) - cases – perhaps?) that these contemporary artists have access to a considerable range of mathematically-based new technologies, and a multitude of technological means by which they are able to arrive (often aided by those more ‘savvy’ in these attendant fields than they are – but neither party would be capable of such realisation on their own) at realising their superb, mathematically underpinned artworks, which are imbued with the kinds of culturally specific mathematical understandings that you have accurately identified (and some others that are less clearly culturally specific, but equally enabled by recent technologies). But it’s important to note that today this happens within the contemporary context with a good deal of technological support, which wasn’t available to Indigenous Australians in pre-contact days, nor, for that matter, to the better known ancient Egyptians who nevertheless developed their own proven techniques of flood mitigation via hydraulics - also developed sans internet modeling & albeit much more recently in terms of the great sweep of human history (maybe \*\*\*ONLY\*\*\* about 5,000 – 3,000 years ago – i.e. recently, in the greater scheme of things!). These contemporary artists routinely employ technological methods to study and visualise spatial relationships, topographies and geographic phenomena, which may well result in the attrition of intuitive means (which may not ultimately be so ‘intuitive’ or ‘innate’ after all, but the result of learned knowledge and processes and ‘hard’ cognitive processes).   
Another example of such beautiful contemporary art that’s mathematically based and also aesthetically pleasing (which maths always tends to be) is Antony Gormley’s sensational architectural work ANOTHER SINGULARITY (2008 – 2009), on display at the Echigo-Tsumari Sculptural Art Triennial in rural western Japan in 2009, @ which at that time I was fortunate enough to visit with some friends. It was unveiled in Tokamachi region in the small village of Futatsuya (please check this installation out on the internet). In Antony Gormley’s work a central polyhedral matrix cohered (is that a word? it is now!) a great number of interconnected concepts, including that of the creation/origin of the universe – ambitious one could say, but ultimately another form of ‘religious’ expression perhaps in the broadest interpretation of what might be regarded as ‘religious’ feeling and meaning (and that is something that the artist himself might, in all probability, very well vehemently deny).

But such artworks do show, I think, that humans haven’t stopped seeking such meaning…guided by maths maybe, but intuition

I will reply to your very extensive post in one more post…

In the meantime you might consider further the idea of deixis...

3 months ago [report](http://theconversation.com/comments/198809/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Molly Gabbard](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191090)

Molly - regarding your final paragraph on the above post, about Indigenous maths elsewhere in Australia, I have recently found out that Michael Christie of Charles Darwin University has been working with Yolgnu Matha speakers (from Arnhem Land in northern Australia) in precisely that area. Some of this work is available on the following link, and may be useful to you:

[www.cdu.edu.au/macp](http://www.cdu.edu.au/macp)

3 months ago [report](http://theconversation.com/comments/200707/abuses/new)

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[**Molly Gabbard**](http://theconversation.com/profiles/molly-gabbard-99517)

Artist and Art Projects Manager

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_200707)

Good morning Christine and all,

I am in agreeance with you on the overarching definition of ethnomathematics in all cultures, indigenous and western. Especially after reading Hickman's article on logorithms and a discussion with my sister who is working on her Phd in Epidemiology - ethno at it's best. It is indeed relative to all cultures.

I would like to see the discussion of ethnomathematics opened and ideas shared cross-culturally. I am aware this has been a tried topic. Looking within…

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I would like to see the discussion of ethnomathematics opened and ideas shared cross-culturally. I am aware this has been a tried topic. Looking within my own culture, as a westerner, the best and most advanced ideas/technologies of mathematics are never enough. The theme tends to be bigger = better, advanced = efficiency = the best.

I propose this topic would be best explored/measured in the arts among multiple mediums in multiple cultures. The linear scale would define the evolution of ethnomathematics and the poles would be A) the most primitive and innate form of mathematics (which could very well be spatial abilities) and B) the advanced technologies that are infinitely changing. How can this study aide in the open exchange of ideas cross-culturally? Visual arts would be my ideal starting point as an experimental and open field.

I would use this scale on a cross-cultural deixis case study (thank you Ms. N for the new vocabulary). Very sensible.

...what would happen if Anish Kapoor made a new body of work in the bush of Arnhem Land using only immediate materials, tools and environment?

...what would happen if John Marwundjul worked out of a computer lab to create digital patterns and prints?

...what would happen if Australian Aboriginal children were were introduced to advanced computer technologies (after having learned their foundational cultural mathematics)?

...what would happen if western children were given the parameters to use only hand tools and nature to complete their mathematics assignments (after having learned advanced technologies to complete assignments)?

What can ultimately be shared in these cross-cultural studies?

During my undergraduate education at Indiana University, my friend and colleague Sim Luttin, Australian art jeweller based in Melbourne, gave herself parameters in the production of her MFA thesis show. Sim made a piece of jewellery each day for an entire year while working on larger works for her exhibition. Each piece a day work was accompanied by a haiku that reflected on the work. After the piece was finished, it was wrapped up not to be looked at by her again until her project was completed. The result was an expansive body of creative work defining her day to day influences, moods and intuitions and solidifying her practice and process of art making.

Visual arts are experimental and open. Artists tend to be intuitive and make what they want to make - accepting their choice medium/tools and remaining content with their practice aside from societal standards. Yes, there are artists that are at the forefront of these new technologies and innovations. But it comes down to accepting that the arts, craftsmanship and ideas of our predecessors, across all cultures, and learning and relearning of these techniques are certainly useful in contemporary innovations.

How do we prove this?

2 months ago [report](http://theconversation.com/comments/203232/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Eleonore WIldburger](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_198194)

Thank you so much, Eleonore, for your timely intervention into this debate - and it is definitely not too late to comment – others have in fact commented more recently, and your comment is very welcome indeed (please accept my sincere apologies for taking so long to respond to your post).   
From this article’s inception, the ideas underpinning it have been aimed at all interested parties, regardless of background; all persons, that is, with a genuine desire to understand this place, now called Australia…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thank you so much, Eleonore, for your timely intervention into this debate - and it is definitely not too late to comment – others have in fact commented more recently, and your comment is very welcome indeed (please accept my sincere apologies for taking so long to respond to your post).   
From this article’s inception, the ideas underpinning it have been aimed at all interested parties, regardless of background; all persons, that is, with a genuine desire to understand this place, now called Australia, and the willingness to engage with alternative ways of thinking, beyond the so-called ‘mainstream’. While I agree with you that it’s important to understand ‘mainstream’ thinking/ideas/ways of doing things, when such understanding excludes other equally valid ways of thinking, whether that be mathematical thinking or otherwise, and becomes an end in itself, it can result in an ethnocentric straitjacket, hampering not only the possibility of level-playing field social relations between different social groups, but also impeding the creation of genuinely new knowledge, based on the fusion of divergent ideas and creative thought.

Besides that, because this place, Australia, is now shared by Indigenous and non-Indigenous Australians, and this will continue into the future, it’s well and truly time (well, actually, well past the time) for the rest of Australia to stop treating Aboriginal Australians like migrants in their own country, and take on board at least some aspects of Indigenous knowledge, not just in a superficial or gimmicky way, but at the level of the episteme. This article has been pitched therefore at Australian curriculum writers and teachers of BOTH Indigenous and non-Indigenous children in schools, and also those who teach young adults in universities, with a view to such approaches becoming part of the curriculum for ALL Australian children, not just one specific interest group to the exclusion of others. For genuine, mutually successful understanding to take place, such an approach needs to take place, so I concur strongly with the point of view that you’ve expressed in your post. You are right in stating that for genuine learning to take place, sometimes people (of all ages, including children) need to be taken outside of their habitual comfort zone albeit in a gentle way, and that taking a comparative approach to knowledge is one way of achieving that. (And we are all ‘ethnics’ at one level!) And, furthermore, I’m in equal agreement with your entirely valid point that introducing such a comparative approach to knowledge shouldn’t be a matter of positing a a binary of “western vs non-western” knowledge, pitching knowledge systems against one another. Rather, it’s a matter of how various views can potentially inform one another, for the common good – i.e. “double power”, not some kind of comic book “battle of the cultures”.

Finally – I would really like to hear more about the “cross-cultural learning conditions that are equally favourable to ALL students involved” to which you’ve alluded at the very end of your post. Are you able to expand on what you understand to be these conditions please? (…because it appears from your post that you’ve already given the matter a good deal of thought). I’m sure that many others apart from myself will be equally interested to hear more about this…

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Molly Gabbard](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_203232)

Hi Molly - good morning or good afternoon - not sure of the current time in Indiana!

Good to hear that you agree with the idea that if it's described as 'ethnomaths' for one, that it's a more level-laying field approach to describe ALL mathematics as 'ethnomaths' for ALL (groups, peoples, cultures, individuals). And it is equally true that certain fields of western science have their own highly specialised and often abstruse, practically "secret ethnomathematics languages". In addition (and I…

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Good to hear that you agree with the idea that if it's described as 'ethnomaths' for one, that it's a more level-laying field approach to describe ALL mathematics as 'ethnomaths' for ALL (groups, peoples, cultures, individuals). And it is equally true that certain fields of western science have their own highly specialised and often abstruse, practically "secret ethnomathematics languages". In addition (and I certainly have absolutely no quarrel about specialised forms of mathematics being brought to bear to aid cures for intractable illnesses and so on), on the other hand "bigger" does not always mean better, and "more complex" is often a criterion inflected with ethnocentric bias, in that "more complex" can at times be used as a form of self-congratulation for so-called "advanced" western and some Asian nations. Language use is always important and we need to remain vigilant about that.

On another note, I LOVE your idea about sending Kapoor out into Arnhem Land to make something sculptural using only the materials that he finds there - or for that matter, Jeff Koons, whose highly capitalised sheltered workshop, puerile toy-box kingdoms (or koondoms?) of so-called "artworks" are, in the so-called creative phase, almost entirely reliant on people with "advanced" 3-D imaging programs working on their computers so that other low-paid visual arts-workers (the Oompa-Loompas of the visual art world) can get up on ladders to construct ridiculously large monuments to Nothing-Much-At-All (his Un-Incredible Hulks). Painting by numbers; sculpting by numbers - where is there evidence in that approach, of the questing human spirit, of the irrepressible human urge to create?

I imagine that it we were set Koons loose in Arnhem Land tomorrow with only the local materials from which to make art, and with only his body and brain to make that art, the artistic result would probably be approximately zilch. In addition, the Koons scenario points to the tenuousness of a good deal of western achievement, and that tenuousness is not exclusively confined to the area of visual arts. And if tomorrow the internet were to be repealed on a global basis, and all of the technical support, computers and so forth were suddenly to betaken away, then the tenuousness of such achievement in some areas at least, would become exceedingly clear. Many things thar we now take for granted would also grind to a halt.

I'm not sure about Kapoor - there's more to him as an artist, obviously, but nevertheless, your point is well-taken.

Sim Luttin's work sounds great and I will follow up - can you please provide a link? Other readers may be interested, too.

Getting back to mathematics, the subject of this posting, and regarding the part of your post where you've written:

"The linear scale would define the evolution of ethnomathematics and the poles would be A) the most primitive and innate form of mathematics (which could very well be spatial abilities) and B) the advanced technologies that are infinitely changing."

I do have some reservations about this statement. By employing an 'evolutionary narrative', unfortunately and inadvertently, and by using words like "primitive" (which is so laden with historical baggage that it can barely be spoken or written innocently any more, and I while I know that it means more than that which meets the eye, and I also know that you are not using these words in those particular ways), "evolution" (an idea now used in the social domain, to express views founded on social applications of Darwinism, aka social Darwinism) and so forth it may be muddying the waters around questions of the already-fraught arena of ethnomathematics. Unfortunately, such language use, and the idea of a continuum existing between "primitive" and “advanced" can inadvertently (or in the case of some people, 'advertently'!) establish a kind of Bourdieuan hierarchy that implicitly (or in some cases, explicitly) places some human beings and human cultures and their attendant practices, including their mathematics, as primitive and inferior, and other human beings and human cultures and their attendant practices, including mathematics, as being advanced, complex, and by implication at least, superior.

It is precisely this kind of binary formulation that I've been trying to contest in this article. But there's a fine line to walk and I know that's not how you intended this comment to be read/understood.

Finally, I totally agree with your idea that "accepting that the arts, craftsmanship and ideas of our predecessors, across all cultures, and learning and relearning of these techniques are certainly useful in contemporary innovations" - and believe that NOT accepting these forms of art, craftsmanship, mathematics and so forth is potentially dangerous. All knowledge is built on earlier knowledge, and we reject such notions to our own peril. It is not overstating the case to say that human survival may depend on accepting the truth of your statement. Proving it? That’s a bigger question, for another day.

Over to you now, Molly...

PS do you know much about the ideas of the (late) French sociologist Pierre Bourdieu, to whose work I’ve referred above?

2 months ago [report](http://theconversation.com/comments/208437/abuses/new)

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Farmer

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_208437)

Gee this is an interesting bit of a chat ... sorry, can't help throwing in another tuppence worth...

I met a young bloke during one of my stints developing my coffee palate at university. Turned out he was a Koori who'd grown up in and all over western NSW. Essentially self-taught.

His school experiences were nearly invariably dreadful and disheartening. As he put it, all he learned was that history and progress didn't include people like him and his gran. That they had achieved nothing…

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It was only after leaving school at 12 and getting himself a stint in juvie did Wayne discover books and his own intelligence. Did his HSC through TAFE and a good uni admission score the year he turned 20.

His insights into being on the receiving end of an assimilationist education model were deeply disturbing. And that this message of worthless irrelevance was delivered and received by age 7 underlines the seriousness and urgency of the problem.

When we bring these kids in ... try and get them to learn our stuff ... we are also teaching them something else. That the future does not include where they live, their family and community. It lies here - with us - elsewhere - that the future does not include his or her past (and present).

The strong ones leave.

This is a hidden curriculum ... a dispossession story where you lot finish the job. Not my words - Wayne's.

Teach your kids about that boomerang of mine and what it signifies ... how knowledge can be different, useful, appropriate or damaging ...

But above all else put them in the picture.

2 months ago [report](http://theconversation.com/comments/208444/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_208444)

Peter,   
Somewhere in this discourse you described yourself as a refugee economist, and you write under the 'title' farmer. I think carpenter best describes you. You keep hitting so many nails on the head.   
All the discussion about curricula (is this the plural of curriculum?), ethno mathematics, bilingual education etc.usually leaves out the pernicious side effect of an ethnocentric assimilationist education programme. As Wayne so well put it: a hidden curriculum... a dispossession story......   
Not…

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Not all that long ago the NT Government sprung the "4 hours English only" non-policy on remote Aboriginal schools. This resulted in the final dismantling of the few remaining bilingual programmes. Every time I raise bilingual education (keep in mind I much prefer 'teaching in the vernacular') at school council meetings I am told that 'two way education' has been reintroduced. A 'Warlpiri Room' was set up attended by classes for one hour 'Warlpiri' sessions that included Warlpiri literacy.   
I am of the opinion that rather than have an English language school with a Warlpiri room, it should be a Warlpiri School with an 'English room' (where English is taught as a second language).   
Now I find out that the Warlpiri room is no more. Warlpiri teachers circulate in the school giving 'Warlpiri lessons'   
Like Wayne the Warlpiri kids are being taught that their language, their history, their way of being (past and present) is not important, that their future lies in the "mainstream".   
Some bright kids do break through but many fall through the cracks (dare I say The Gap!).   
My wife who was involved in the bilingual programme since its inception told me of one of the early Warlpiri teachers (who sadly passed away not long ago) who had taught himself to read and write and became fully bi-literate, that after he had mastered reading (which opened a whole world of knowledge to him) he felt that until then he had been living under a blanket. The Warlpiri (as a generalisation) are masters of metaphor as well as being bloody good at Aussie rules football.

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Farmer

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_208543)

Thanks for the nice words Frank ... would that I could do something - anything - as useful as carpentry.... been a lot of things over my time but I still have trouble with bookshelves.

It's pathetic isn't it that this token effort of ours of 'keeping culture alive' with a warlpiri room seems deliberately designed to do the opposite, Ministry of Truth style. Tragic really all those 'good intentions' paving the way... as ever.

So here's a positive suggestion about how our schools can help keep…

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So here's a positive suggestion about how our schools can help keep culture alive for real without totally capitulating to a Dark Arts curriculum.

Yer schools get a bit of tough digital camera gear and the kids have a job for the year ... a social history ... everyone can do it ....black, white, confused... go and talk to your parents, the old folks, the bloke over the road ... get their stories...find out what happened here ... excellent and useful training - multi-disciplinary - cheap but requires a bit of imagination and a primer on doing interviews and the like ... do it in language if needed ... subtitling might be part of the job ... something useful out of a useful process.

Silly idea ... who'd be interested in that? Short answer - them. Will it teach them to read and write - not directly - but it teaches them that they - and their stories - matter here.

2 months ago [report](http://theconversation.com/comments/208551/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_208444)

I too thought that this was a great post, Peter, and very telling in terms of Wayne's story. Your following post, about giving kids a camera and recording the stories of older people, is equally spot-on, and in fact the Warlpiri media have actually been doing this for some time, up in Warlpiri country.

But to take up Frank's point, and perhaps take it a little further, it's important that we also engage with the present, rather than simply record for posteritythese remarkable stories of older…

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But to take up Frank's point, and perhaps take it a little further, it's important that we also engage with the present, rather than simply record for posteritythese remarkable stories of older people (an idea that I fully support, btw, and it's certainly not a case of either/or, but both/and) because there is still huge community concern in all of the Warlpiri communities about the governmental closing-down of the relatively effective (and here I mean relative to any other educational approach that's been tried in the past 30+ years) bilingual education programs, and importantly, these programs had/have strong parental and community support, which can't be said for more recent initiatives in the area of Warlpiri education. On this point, almost all Warlpiri people I know feel that they have been betrayed by successive governments. It's also necessary to state here that Warlpiri do not feel Aboriginal persons like Noel Pearson speak for them, or on their behalf, in any significant way. This is akin to expecting a Latvian to speak on behalf of an Austrian. (Non-Indigenous Australia still largely suffers from what I would describe as its misguided "Take Me To Your-Leader" approach (misapprehension) when it comes to Indigenous Australian matters, rather than conceptualising Aboriginal Australia as being multicultural.

I realise that in writing this I'm not telling you anything you don't already know, but my major point is that somehow the political views of both major Australian political parties are failing when it comes to Warlpiri education.

So let's hear it for living cultures, living languages, and let's push for that too, in the context of current ill-advised policies, while we still have the chance to do so...

about 1 month ago [report](http://theconversation.com/comments/210975/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_193443)

Hi Peter,

I did just a quick Google search and found quite a few reports, including this one on Indigenous numeracy that summarises much of the research in this area: <http://ab-ed.boardofstudies.nsw.edu.au/files/evaluation-maths-indigenous-k-2.pdf>

The section titled "the development of numeracy by Indigenous children" (page 18) is particularly interesting, especially the notion of mathematics as a form of social enculturation.

about 1 month ago [report](http://theconversation.com/comments/211422/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_210975)

I have been following the discussion now for some time without comment, but the implied criticism of Noel Pearson struck a nerve. As reluctant as I am to be critical of someone so obviously well meaning, it may be time for a reality check. The proposition of using cultural anecdotes to somehow justify the inclusion of obsolete dialects in the national curriculum trivialises attempts to assist indigenous Australians to participate in society in the modern world is fanciful and potential harmful, as a distraction from the efforts of Noel and his supporters. There is a clear and present need to put the past behind us and plan on a future of equality and inclusion. Indigenous Australians should continue to excel in AFL and other endeavours, but be given every opportunity of absorbing the skills and knowledge to fully participate in society as it is, and will be. By all means, maintain cultural links to the past, but all such effort must be extracurricula.

about 1 month ago [report](http://theconversation.com/comments/211564/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_211564)

Just as the implied criticism of Noel Pearson struck a nerve with you, so did your "the inclusion of obsolete dialects in the national curriculum trivialises attempts to assist indigenous Australians to participate in society in the modern world" struck a nerve with me.   
The Warlpiri language is not an obsolete dialect by any stretch of the imagination. For people in Yuendumu it is not a link to the past, but very much a part of the present (and hopefully the future).   
Warlpiri is a beautiful highly…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Warlpiri is a beautiful highly complex language. Quite a few young Warlpiri people are "participating in society in the modern world" by a lively exchange taking place in Warlpiri on "Warlpiri Chat" on Facebook.   
The problem facing Warlpiri youths, is that their language and way of being is not valued by society (except when they kick a ball). This plays havoc with their self esteem and well being and certainly doesn't give them much hope for a future of equality and inclusion.   
  
'Culturism' typically manifests as; "I'm not racist. I believe that everyone, regardless of race, should be free to live just like me." It is not racist, but it is denying people the freedom to live differently. It's hard to argue against because although most people can understand race is a minor and arbitrary difference, they struggle to understand and accept that people would genuinely want to live a different way. To them it just looks like the "wrong way" that needs to be corrected.

about 1 month ago [report](http://theconversation.com/comments/211579/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Molly Gabbard**](http://theconversation.com/profiles/molly-gabbard-99517)

Artist and Art Projects Manager

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_208437)

Good evening in over in Adelaide Christine!

Thank you for the extensive reply and thoughts.

First, I apologize for my degrading remarks on the linear scale...I forget the impact and multiple meanings of heavy words such as 'primitive' and 'evolution'. As a visual artist, I have minimal experience investigating topics in a well thought out and non discriminatory manner. During my undergraduate I took courses in human sexuality and I was too simply regarding the university Kinsey Scale…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Good evening in over in Adelaide Christine!

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Here is the link to Sim Luttin's piece a day project, <http://www.simluttin.com/gallery/exhibitions/piece-a-day-project.html>. Excellent work and project. It is now a part of the curriculum at in the jewelry department at IU (however only for a week opposed to a year).

I agree with your projections of Kapoor and Koons in the bush of Australia. I think Koons would be at a loss with the immediate materials...however what he would take from experiences and create back in his studio can only be imagined and under glamorized for what he'd produce. Kapoor, I believe, would aim to connect the heavens with the earth, similar to the dreaming.

In keeping with the discussion among yourself and other participants I wish it was easy to enable the confidence and fuel the abilities of Aboriginal persons of committing and building upon the preservation of one's culture, traditions, etc. However, this of course would be easier without the challenge of a governing body who's focus for the country is to live in an economy rather than a society...which seems to be a universal issue. A loaded statement but nonetheless something that weighs on my mind.

Preservation and sharing of culture is key! Be open...easier said then done.

about 1 month ago [report](http://theconversation.com/comments/212951/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Molly Gabbard](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_212951)

Hello Molly,

Thanks for the Sim Luttin link, which I'm sure many will read, like me, with considerable enjoyment.

It’s our national election today, here in Australia, so I’m taking a little time out from thinking about that (although the result is pretty well a foregone conclusion, and by the time you read this we will almost certainly have a new government; perhaps even before I finish writing this) to respond to your most recent post.

Thank you for your post, which is, as usual, thoughtful…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Thank you for your post, which is, as usual, thoughtful as well as thought provoking. I’ll begin this post by discussing language use further, but then bring the discussion around to visual art, which I know to be your predominant interest. And then we'll wind our way gradually towards Indigenous Australian art.

Regarding the usage of ‘those’ words ‘primitive’ and ‘evolution’, words which I think that you were using in your earlier post in a similar way to the ways in which art historians sometimes use such terminology even today (i.e. as art history classificatory terms these words/concepts are still regarded by in the western art world as being ‘neutral’ or merely ‘descriptive’ terms), I do think that in the contemporary context however, and especially in the specific context of this discussion, it’s preferable to avoid/steer clear of certain words/terminology insofar as over time they’ve acquired a good deal of negative historical baggage.

Here I’m thinking of language use in terms of pragmatics (pragmatics is the branch of linguistics that deals with language-in-use, in which deixis holds central importance; pragmatics as a sub-branch of linguistics factors in which the social context of words/utterances and how people produce, comprehend, perceive and negotiate meaning/s through language, are routinely factored in). Seen in this light, i.e. deictically as per pragmatics, some words are not quite so neutral or innocent as they might appear to be on the surface…

I’ll quote now from Rodney Huddleston and Geoffrey K. Pullum’s A Student's Introduction to English Grammar. Cambridge University Press, 2006)

“The term deixis applies to the use of expressions in which the meaning can be traced directly to features of the act of utterance - when and where it takes place, and who is involved as speaker and as addressee. In their primary meaning, for example, now and here are used deictically to refer respectively to the time and place of the utterance. Similarly, this country is likely to be interpreted deictically as the country in which the utterance takes place. Several of the pronouns are predominantly used deictically, with I and we referring to the speaker and a group including the speaker, you to the addressee(s) or a set including the addressee(s).”

In the case of ‘primitive’ the unfortunate implications are of savagery and intellectual simplicity, whilst in the case of ‘evolution’ the term evokes ideas about peoples whose “life patterns represent cultural phases through which the [so=called] great civilisations” have progressed (Osborne 1992, in The Oxford Companion to Art, 1992: 924). Essentially it’s based on the misapprehension that the trajectory of history is one of sustained progress in a linear fashion, and I think that if we study humanity in terms of the overall timeline of human existence on earth, there isn’t a lot of evidence (well, none really!) that we human beings have actually progressed greatly over the eons – at least not in the ways that matter most – for example, notwithstanding all of today’s technological inventions & wizardry, we still go about the business of war-mongering, killing and in some cases raping others more or less gratuitously, taking over lands belonging to others, is some cases treating women like chattels, mistreating and abusing children and more - and we’ve also invented noxious ideologies to justify/support such activity. We even bring some technologies to the support of such pursuits.

Getting back to the word ‘primitive’ in the art history context, Harold Osborne, the Editor of the Oxford Companion to Art, goes on to write in his entry titled PRIMITIVE (ART)

“…Hence the art products of such peoples as the African negroes south of the Sahara, the Eskimos, and the inhabitants of the Pacific Islands came to be referred to as “primitive art”. Later as it became evident that these cultures were not necessarily in either a formative or degenerate stage but had achieved maturity within a system of social organization and technology different from western European civilization, the term “primitive” was recognised to be inappropriate though agreement as to an alternative nomenclature was not reached. It has similarly become evident that the term “primitive art” as a term denoting products of primitive peoples carries no implications of aesthetic or technical inferiority and implications that it belongs to an earlier or fumbling stage of development towards greater artistic maturity.” (Osborne, first written 1970, revised 1992: p 924 – & please note that some of the language - e.g. 'negroes' - that Osborne himself uses has undergone change as social contexts have changed).

Later in the same entry Osborne writes to the effect that recognition of the maturity of “other” visual art within its own cultural traditions is necessary in terms of developing any real appreciation of such “different” art. Many persons of western-European based cultures, and those who are their descendants, continue to have a problem in actually recognising that it’s OUR OWN imperfectly apprehended understanding of the visual art of different cultures, as well as our imperfect understanding of aesthetic standards that differ from our own, that leads us to make such negative judgements. Often accompanying this is an equally judgemental language that we don’t even recognise as judgemental because it’s so widely socially and culturally endorsed by others in our immediate social milieux.

Let’s just say that certain words have become historically burdened with undesirable connotations. At the same time I’m 100% aware that you did not intend to project such negative inferences in your earlier post.

To consider the idea of 'evolution', now, in relation to visual art, it’s also clear that that many persons in our dominant cultures bring this idea of the evolutionary development of human societies to bear in relation to the visual art of “others” too, believing in the erroneous idea that some human societies/cultures are at an earlier stage of ‘development’ than others. Many art historians, for example, have believed that the “invention” of linear perspective was a breakthrough in the history of art, and that cultures that do not deploy this 'invention' of linear perspective are at an ‘earlier’ developmental stage than others that use linear perspective in their artworks.For example, Egyptian art did not deploy linear perspective; neither did/does traditional Aboriginal art; neither did traditional Islamic art. This does not mean that a body of artwork made by a certain sociocultural group is more or less advanced than another; only that certain groups organise space very differently and those different ways are played out in their artworks.

Refuting tacit claims of European art’s visual and cultural superiority, Rudolf Arnheim wrote that:

...When the figures in Egyptian art look ‘unnatural’ to a modern observer, it is not because the Egyptians fail to present the human body the way it “really is”, but because the observer judges the work by the standards of a different procedure. Once freed of this distorting prejudice, one finds it quite difficult to perceive the products of the “Egyptian method” as wrong.   
(Arnheim, 1974, p.113)

Indeed, different artistic cultures DO create, make and judge artworks by “the standard of a different procedure”, as Arnheim so eloquently puts it. To reiterate, the so-called ‘invention’ of the principles of linear perspective, involving the creation of an illusion of three-dimensional space using two-dimensional media, has been hailed as a major breakthrough in art history. This development should not however be regarded as a cultural universal, against which all other artistic conventions are judged. In fact, as already stated, many of the world’s artistic traditions do not use linear perspective. The major coordinates of space and time - and the inter-relationships between them – are conceptualised, in visual terms, very differently by different cultural groups.

Generally credited to the Italian architect Filippo Brunelleschi (1377-1446) (although there are historical precedents pre-dating Brunelleschi), the ‘invention’ or ‘discovery’ of linear, aerial perspective is based on what is in fact a very simple empirical observation: that the farther away an object is from the ‘looker’, the smaller it appears to be. A single, fixed and individual ‘looking’ - or ‘observational’ - point is strongly implied in this formulation. With respect to Indigenous art from Central Australia and the Western Desert, there is no fixed or single looking point so this ‘foreshortening’ effect was and is simply not needed.

This is more than enough from me for now – but I hope that I’ve provided some ideas about the ways in which specific forms of art-making and also how people think & talk about the visual art of differing social and cultural groups, based on specific socio-cultural ideas about space, are interconnected/entwined. The ideas in this post about Indigenous maths, and its foundations in spatial thinking, and its relationship to the Australian football game (AFL), are also applicable to Indigenous Australian art…to be continued soon…

with warmest wishes from the Land of Oz.....

about 1 month ago [report](http://theconversation.com/comments/215299/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**Geoffrey Harold Sherrington**

Boss

I''m not sure that your methodology is good when you describe differences, however interesting they migjt be, then ascribe deep meaning to them. A s;tory -   
One of our children at kindy age started to bring home paintings that used more and more black paint. Some social medico friends gently suggested psychiatry of depression be tried. Armed with reports, we approched the kindy teacher who replied :That's easy. W!e ran out of piaints in all but black.paint.   
Proper experimental design is more important than phenomenology.   
Maybe the air photo painter style arose becase so mny people had seen so mny originals.

3 months ago [report](http://theconversation.com/comments/191208/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Adele Pring**](http://theconversation.com/profiles/adele-pring-99067)

Educator

My reason for providing information for teachers about Aboriginal astronomy and mathematics several years ago but was so much to have all students learning all of it but teachers being aware of the quite sophisticated knowledge and skills of many Aboriginal people, so the teachers wouldn't have such a deficit view. Having learned quite a bit myself in doing the research I now have a quite good sense of direction during the day and night. I was already quite good at map reading which I put down to…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

My reason for providing information for teachers about Aboriginal astronomy and mathematics several years ago but was so much to have all students learning all of it but teachers being aware of the quite sophisticated knowledge and skills of many Aboriginal people, so the teachers wouldn't have such a deficit view. Having learned quite a bit myself in doing the research I now have a quite good sense of direction during the day and night. I was already quite good at map reading which I put down to having freedom to explore the local country community on my bike as a child and through rural holidays with family. Aboriginal children have more freedom than most to explore space. Many children, probably globally, now don't realise the sun rises and sets in different places? The skills discussed can be valuable for survival. Where they fit in the curriculum is another matter including Mathematics, Science, English, Humanities and Social Sciences, Health and Physical Education, Languages, Technologies.

3 months ago [report](http://theconversation.com/comments/191300/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Adele Pring**](http://theconversation.com/profiles/adele-pring-99067)

Educator

Regarding how Aboriginal people know - I read that when asked they didn't know how they knew, they just knew and I suspect this is because they learned much of it, according to the research, before they could walk and soon after with ongoing lifetime reinforcement.

3 months ago [report](http://theconversation.com/comments/191302/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Brian Wicks**](http://theconversation.com/profiles/brian-wicks-99506)

Secondary Maths Teacher

One of the key things about this article is the way in which it encourages us to think outside of the box in terms of the way that teachers present mathematics and utilise existing strengths and understandings.

As someone who has regular contact with a remote SA Aboriginal community it soon becomes obvious in a class setting that paradigm is everything. It is one of the first features that the mainstream suburban students I take on exchange notice when sitting in class with their Aboriginal friends…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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If we are to have success with developing Indigenous literacy and numeracy then part of that process needs to be to play to strengths within a distinct group. Pedagogically we know that learning is more likely to occur when there is an emotional connection. Recognition of culture is regularly cited as a significant desire of Indigenous Australians in regards to their wellbeing. This coupled with the buzz many adolescent (and younger) students have when engaging with sport allows scope to develop strong learning patterns.

Having cultural understandings and frameworks acknowledged and utilised allows scope to do this rather than only using a more abstract and less connected system without reference to those which already exist.

Using football in this integrated way is a relevant addition to the no school, no play policy that a number of schools and football based academies employ.

3 months ago [report](http://theconversation.com/comments/191409/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**Geoffrey Harold Sherrington**

Boss

In reply to [Brian Wicks](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191409)

"If we are to have success with developing Indigenous literacy and numeracy"

Better think up some ideas fast, eh?. Nothing that has been tried over 150 years or so has worked all that well for at least a segment of the people.

Football and the buzz it gives? Might as well go the whole hog with free sex, with the bigger buzz that it gives.

You educators, having failed so badly so often, are still heading to the absurd. Pig skin cures. ROTFL.

3 months ago [report](http://theconversation.com/comments/191496/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Brian Wicks](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191409)

Sadly, as Christine has repeated over and again, for some reason 'numeracy' is not part of the Aboriginal cognitive system.

3 months ago [report](http://theconversation.com/comments/191524/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Brian Wicks](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191409)

Numeracy is an oppressive instrument of genocide by the "dominant culture", "imperialist" and so on.

3 months ago [report](http://theconversation.com/comments/191525/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Brian Wicks](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191409)

Brian: thank you very much for this thoughtful and important contribution to 'the conversation' around this topic, which I hope many others will read and take on board as well. You make many significant points which deserve to be emphasised:   
\*respect for different ways of thinking (or what you've glossed as 'paradigm') is essential;   
\* that all children in schools need to experience some successes and that therefore all students do need an opportunity for their strengths to be foregrounded - the…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Brian: thank you very much for this thoughtful and important contribution to 'the conversation' around this topic, which I hope many others will read and take on board as well. You make many significant points which deserve to be emphasised:   
\*respect for different ways of thinking (or what you've glossed as 'paradigm') is essential;   
\* that all children in schools need to experience some successes and that therefore all students do need an opportunity for their strengths to be foregrounded - the links between self-esteem and learning are well-documented, not just anecdotally but in a good deal of research;   
\*the fact that real learning doesn't just engage the mind but the heart - what you've described as an 'emotional connection' (without which I should add, often kids or learners of any age just switch off);   
\*the respectful acknowledgment of differing cultural frameworks and understandings is essential;   
\*and the links between cultural recognition of the children we teach and their sense of well-being.   
The latter point reminded me of a number of elderly Aboriginal artists I've interviewed over the years who've said quite explicitly, that they feel good in their bodies and hearts when they're painting their Dreamings.

These are things that all teachers of students, no matter what their age, need to take on board, and they do lead to improved outcomes in areas like literacy and numeracy, because to become effective learners people need to feel good about themselves.

Thank you for this post - and for laying it out so clearly & beautifully.

3 months ago [report](http://theconversation.com/comments/192002/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192002)

"respect for different ways of thinking (or what you've glossed as 'paradigm') is essential;"   
Christine, presumably you are a passionate champion of the 'different ways of thinking', such as liberal capitalism, neoconservatism, marxism, logical positivism, and so on? Presumably, we would see your efforts in this area clearly reflected in the National Curriculum, no?

3 months ago [report](http://theconversation.com/comments/192028/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192002)

"the links between self-esteem and learning are well-documented, not just anecdotally but in a good deal of research"   
In fact, the links between "all must have prizes" and 'learning' are indeed well documented. They show a strong NEGATIVE relation.

3 months ago [report](http://theconversation.com/comments/192040/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192028)

There is a slight difference between a significantly altered set of perceptions of place (and I suspect time) and differences in opinion. Were you interested in actually considering the issues under discussion rather than pursuing this odd sort of self-debasing heckling, you would make some effort to understand what is being said.

This is actually a deeply serious problem David... the fate of what remains of a whole culture hinges on it. Now you might see nothing of importance in that beyond…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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This is actually a deeply serious problem David... the fate of what remains of a whole culture hinges on it. Now you might see nothing of importance in that beyond an "evolutionary inevitability" and a cause for flippancy. Others disagree. This is in the first instance about human identity and the misery of the loss of it, it is also about maintaining valuable knowledge. In my view it is also about protecting something most precious and rare, a unique worldview.

Now from your comments I'd be making a solid wager that you in fact know no Aboriginal people whatsoever, let alone someone raised speaking one, two or three languages other than English - who did not encounter English till school. You probably doubt such people exist.

Try a simple exercise at understanding and empathy. Picture yourself on the first day at a one room school in red dirt country and you don't understand a word they're saying, sitting there with these desk things and chairs and pictures of unheard of things ... take it from there. How are your tables?

These kids confront a massive cultural chasm - they must leap between the past and the future and hold onto what is good in both. That's a lot to expect of a six year old.

So I wish Ms N and others the best of fortune if they can find a way to make education an Aboriginal entitlement, largely community managed so that it is their school ...that they can legitimately claim ownership of it, of what is taught and how.

Because every effort so far by the most well-intentioned bureaucrat, the most humane missionaries, the most knowledgeable experts and the most ignorant commonsense observer has come to little.

The time for fiddling about is limited. So please try and grapple with the issues and develop a constructive approach lest you find yourself snarling and grumbling away on the sidelines while history marches on.

3 months ago [report](http://theconversation.com/comments/192051/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Claire Bockner**](http://theconversation.com/profiles/claire-bockner-46934)

logged in via email @bigpond.com

In reply to [Brian Wicks](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191409)

Brian,

I'm sure you're right about ways of developing Indigenous literacy and numeracy. A good teacher elicits ENGAGEMENT from their students and sport is an obvious way of doing this with young people, particularly in the remote communities, I'd imagine.

3 months ago [report](http://theconversation.com/comments/192069/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192051)

Peter, your speculations on my personal experiences are as self-serving as they are so wrong. I am not engaging here with the feelings of oppressed/different peoples, I am engaging with the ideology driving players in the gubba Aboriginal/Education Industries and their project to manipulate the school curriculum to effect that ideology and thus win transfers of taxpayer money to feather the nests of theirs and their ideological pals and allies. I am insisting on evidence and rationality. This thread…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Without going into it too much, I have long-standing interests in cognition, especially non-verbal cognition. In particular, the links between Mathematics and visuospatial cognition; interests that have personal since teachers in high school explained the links between our visuospatial cognition and our progress in geometry and calculus, and even algebra and arithmetic. In my professional life, these issues appear constantly.   
But unfortunately, on this thread, there is more ideological woo tied up with vested interests. I have children, who I want to be educated. So, this is also personal.

3 months ago [report](http://theconversation.com/comments/192070/abuses/new)

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[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192070)

David,

I would be assuming your kids probably speak English, probably have a better sense of what school might be about, lord knows you might even have a book, or some pens and paper lying around at home, or a TV.

I would like you to explain how my speculations are self-serving David.

Anyway, quite clearly you have the answers already - you are fighting the good fight against "ideology" in all its forms ... excellent. But I'm afraid your comments and lack of interest in understanding the…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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I would like you to explain how my speculations are self-serving David.

Anyway, quite clearly you have the answers already - you are fighting the good fight against "ideology" in all its forms ... excellent. But I'm afraid your comments and lack of interest in understanding the issues being discussed suggests strongly otherwise.

You just don't like the idea of "special treatment"... they should just learn the stuff like you did and your kids will - despite all the evidence to the contrary, all the records, all the histories of failures in taking exactly this approach.

Please don't frock-up this ignorance as some sort of insistence on evidence and rationality ... the evidence is everywhere out there, and there is no rationality in repeating the errors of the past and expecting a different outcome. Nah, this is just being a negative cynical smart-arse.

3 months ago [report](http://theconversation.com/comments/192077/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192077)

Peter, you have not understood a word I have written on this thread. All you have done is copy and pasted a letter you had published in the "Horse and Cart News" in 1953 signed "I Don't Like It" (Tumbarumba via Tunbridge Wells)

3 months ago [report](http://theconversation.com/comments/192085/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192077)

Peter,   
Like you I resent the assumption that anyone advocating for the rights of children to receive an effective and meaningful education are being self-serving and have got their snout in the trough of the "Aboriginal Industry". Out here I see very little of that taxpayers money trickling down in an effective way to those it is alleged to help.   
Not that you need reminding but this from the UN Declaration on the Rights of Indigenous Peoples:   
Article 14   
1. Indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning.

You wouldn't think so, but Australia endorsed the declaration!

3 months ago [report](http://theconversation.com/comments/192107/abuses/new)

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**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192107)

Frank, the Aboriginal Industry is made up overwhelmingly by city-dwelling gubbas and colonisers of the "dominant culture", not Aboriginal people themselves.

3 months ago [report](http://theconversation.com/comments/192110/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

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Farmer

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192107)

Yes Frank ... I don't know where the dough goes... well I have a hunch about a bit of it ... knew a couple of subbies - a chippy and a roofer who made an small fortune on government contracts up your way...3X the going rates in Sydney ... they'd laugh about it. Not mates in any sense.

Nicely raised re the UN declaration. But it's worth noting that it's not just a (warm inner glow kumbayah) "human right" to maintain one's cultural identity including and perhaps particularly through education, but anything that helps hold Aboriginal communities together - keeps them functioning, creates organisation - is a good commercial investment from a health and welfare budgetary perspective.

The costs of social collapse and disintegration - the consequence of a loss of cultural identity - continue across generations, persist and spread. It got us where we are today.

3 months ago [report](http://theconversation.com/comments/192121/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**David Thompson**

Marketing Research

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192107)

Frank, any culture that needs to shake UN 'Declarations' for its survival, has already died; let alone a culture that can in no way pay for itself.

3 months ago [report](http://theconversation.com/comments/192132/abuses/new)

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[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

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Farmer

In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192132)

Now there you go again David ... worrying about paying for ourselves... sliding deeper and deeper into the mire of the national mortgage...

See if we're talking about culture's that can't pay for themselves have you had a squizz at how much we've run up on tick lately? Not the Fed's - but gee the State Governments were going to town there for a while under Peter Costello ... but no I mean the real deep "cultural" debt of mortgages, car loans, bankcard debt and the like. Never a night goes by without being offered "help" by a string of debt management companies on TV.

Wasn't government debt that gave us the GFC David ... it was "cultural" debt... the stuff we borrow to get the plasmas and the new 4X4s... the costs of our "culture".

What a shockingly dumb notion ... that culture should "pay for itself" - Can't we send these white boat people home????

3 months ago [report](http://theconversation.com/comments/192144/abuses/new)

* 1. In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192144)

Comment removed by moderator.

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192121)

Peter,   
This discussion has more or less run its course. Some excellent comments not least from your good self, which I'd like you to know I much appreciated.   
The Conversation was somewhat marred by some antagonistic non-sequiturs.   
As a way of unwinding you may enjoy this non-sequitur:

<http://www.youtube.com/watch?v=kQFKtI6gn9Y>

3 months ago [report](http://theconversation.com/comments/192221/abuses/new)

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Farmer

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_192221)

Gee that takes me back .... although it seems like I myself have routinely been colliding with whatever S 21 of the "Humour Act" prohibits.

But yes, a fair cop ... thanks for the chat.

3 months ago [report](http://theconversation.com/comments/192236/abuses/new)

* 1. In reply to [David Thompson](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191524)

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1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Stephen John Ralph**](http://theconversation.com/profiles/stephen-john-ralph-17674)

carer

Am I wrong in assuming that this discussion has been almost all male-centric.

3 months ago [report](http://theconversation.com/comments/191413/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

**Geoffrey Harold Sherrington**

Boss

In reply to [Stephen John Ralph](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_191413)

I've given female gender examples.

3 months ago [report](http://theconversation.com/comments/191477/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Michael Christie**](http://theconversation.com/profiles/michael-christie-101265)

Professor of Education at [Charles Darwin University](http://theconversation.com/institutions/charles-darwin-university)

Is the remarkable footy ability of Aboriginal people anything to do with ‘mathematics’ as Christine Nicholls suggest? It depends of course on how we define mathematics, but I for one accept her claim. However after 40 years working with Arnhem land Yolngu knowledge authorities as linguist and educator, the puzzle in my mind is related, but somewhat different: How might we make use of local practices if we want to avoid the colonising and inhibiting effects of traditional maths education in remote…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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2 months ago [report](http://theconversation.com/comments/202391/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Michael Christie](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_202391)

Thank you for this thoughtful and considered post, Michael Christie, to which I’d like to make a couple of comments in response. The first is that I don’t believe that there needs to be a choice between what you’re suggesting in your post and what is being suggested in my article (which certainly lacks detail in terms of the ‘how to’): both constitute viable approaches. I think that it’s important to put aside or, rather, transcend, the dualism (usually expressed as binary hierarchical oppositions…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Perhaps the Greenpeace catchphrase ‘Think globally, act locally’ is more relevant in this instance. Bringing the mathematics of everyday community life is, at one level at least, precisely what is being advocated here. For many young Australians - no matter what their family backgrounds – and especially but certainly not exclusively boys, AFL constitutes a significant part of everyday life, and thus provides a perfect exemplar for discussing mathematical thinking, if mathematics is not understood as being narrowly defined (for example, one of the earlier respondents to this discussion consistently conceptualised maths as being pretty well exclusively founded on arithmetic). So in terms of using AFL as an exemplar in mathematics classes, if we ask the question of ‘whose’ everyday life, it traverses the daily lives of many young and not-so-young Australians.   
Then there is the other big question: that of educating other Australians about Indigenous ways of thinking (mathematically and otherwise) and of being-in-the-world. There’s still an awful lot of work to be done in this regard. As the Indigenous linguist and activist Jeanie Bell wrote in her 1993 Boyer lecture:   
“We’re dealing with a mass of non-Aboriginal people who don’t even realise that Indigenous languages survived; some are surprised that we ever had languages at all.”   
(Bell, Jeanie, ‘Australia’s indigenous languages’, publ. in Voices from the land: 1993 Boyer lectures (pp. 45-61), ABC Books, Sydney, Australia, pp 45 – 61).   
Although Jeanie Bell put this position forward some twenty years ago, the situation hasn’t changed markedly since then, and has perhaps declined even further over the two decades since she penned those words, in terms of non-Indigenous Australians’ often-scant or worse, factually incorrect, and often demeaning, understandings of Indigenous languages and the knowledge that accompanies, or is encapsulated by, these globally endangered Australian languages.   
It is important therefore, I feel, to work on multiple fronts – not only in local communities, which is of course important but can become overly self-referential and parochial. It’s equally important to transcend locality in our thinking in terms of engendering mutual respect between Indigenous and non-Indigenous Australians, by thinking about/discussing the various equally valid ways of speaking, thinking and being-in-the-world – which is also a means of contesting those resilient hierarchical binaries. In order to transcend an exclusively inward-looking world view, which can result in people judging one ‘way’ as more valid or viable than another, it is important to develop accurate ways of understanding the ways of others, no matter how fledgling those understandings might be. Here I am talking once again primarily about non-Indigenous Australians (mostly – and of course historically there have been, and still are, some notable exceptions to this) often very poor grasp of Indigenous histories, ways of viewing the world, and intellectual traditions.   
It is also important to note that in terms of learning it is important for people to come to the realisation that to understand the cultural mores/practices of another group, first they need to understand something of the basis of their own culture and its practices, which can be very taken for granted when people are immersed in them. In other words, in terms of teaching/learning, and in the context of the current discussion, it is equally important for non-Indigenous children in urban areas to understand something about these ways of thinking, and unless that is reflected in the curriculum in some way or another, it just won’t happen! There are still, to this day, successive groups of migrants coming to Australia, and this constitutes a huge and important challenge educationally in terms of respectful cohabitation with Australia’s first inhabitants. What I’m talking about in curriculum terms is engendering a higher level of self-reflexivity on the part of students – and I do not think this is aiming too high, in terms of expectations both of ourselves as teachers (and of course also as learners) and students.   
Perhaps the point about ‘embedding’ Indigenous perspectives in the curriculum warrants some further explanation, too. The suggested idea of including some reference to Indigenous maths in the curriculum is actually to a greater extent about expecting non-Indigenous kids, who make up most of our Australian school population (and their teachers) ‘to learn about’ rather than actually or necessarily learning the highly detailed ‘how’ of deploying cardinal directions in their daily lives (as many tradition-oriented Aboriginal people are capable of doing and indeed continue to apply adroitly in many aspects of their everyday lives to this day, including, more specifically, games like AFL) – although this would be a real plus, as well. In terms of education the curse of low expectations is still apparent in parts of the Australian education system, at all levels...but when more is expected of people, they are usually able to rise to the occasion…   
Related to this is the undeniable fact that many non-Indigenous children’s and even young adults’ abilities in the area of cardinal directions/these spatial relationships have, over the years, been steadily declining – probably as a result of spending more and more time confined within four walls, engaged in mono-directional activities, such as playing video games on the computer etc etc.   
So what I’m advocating here is a genuinely inclusive maths curriculum that will benefit all children, albeit in different ways…

And with this I’ve said quite enough – over to you now Michael…

2 months ago [report](http://theconversation.com/comments/204763/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Cris Edmonds-Wathen**](http://theconversation.com/profiles/cris-edmonds-wathen-102048)

Lecturer

A frames of reference approach to looking at the types of spatial language under discussion can help get away from questions of "stronger" or "weaker" spatial senses. Peoples and their languages solve the common problem of   
how to talk about movement and location in different ways. Some of the choices they make are environmentally salient - using upstream/downstream in mountainous valleys of PNG, using seaward and inland on islands, using cardinal directions in deserts. Some of them may be arbitrary…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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how to talk about movement and location in different ways. Some of the choices they make are environmentally salient - using upstream/downstream in mountainous valleys of PNG, using seaward and inland on islands, using cardinal directions in deserts. Some of them may be arbitrary or due to other complex cultural factors. Some linguistic solutions may be more useful in some circumstances than others.

I'm really interested in the question of what languages can contribute to the development of new mathematics. In standard vector mathematics the zero vector has no or every direction. But if orientation is the most salient feature of a spatial system (as it possibly is for Iwaidja), perhaps points can be conceived as oriented ...

On another note, the sheer amount of time that some kids spend playing football in enthusiastic, proficient groups also has a positive effect on their skill development.

Edmonds-Wathen, C. (2011). What comes before? Understanding spatial reference in Iwaidja. In M. Setati, T. Nkambule & L. Goosen (Eds.), Proceedings of the ICMI Study 21 Conference: Mathematics and language diversity (pp. 89-97). São Paolo, Brazil: ICMI.   
Terrill, A., & Burenhult, N. (2008). Orientation as a strategy of spatial reference. Studies in Language, 32, 93-136.

Levinson, S. C., & Wilkins, D. (Eds.). (2006). Grammars of Space: Explorations in Cognitive Diversity. Cambridge: Cambridge University Press.

Palmer, B. (2002). Absolute spatial reference and the grammaticalisation of perceptually salient phenomena. In G. Bennardo (Ed.), Representing space in Oceania: culture in language and mind (pp. 107-157). Canberra: Pacific Linguistics, Research School of Pacific and Asian Studies, Australian National University.

2 months ago [report](http://theconversation.com/comments/207260/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Cris Edmonds-Wathen](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_207260)

Dear Cris,

Thank you so much not only for your significant post, but also for the useful reference list, which should prove invaluable for readers who wish to take their interest in this topic further. (I’ve already placed my orders for those articles/books).   
The ‘frames of reference’ approach you describe is certainly not incompatible with what I’ve written in this article, although I’d perhaps prefer to describe the ability to negotiate space in variable ways, and the equally variable ways…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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The ‘frames of reference’ approach you describe is certainly not incompatible with what I’ve written in this article, although I’d perhaps prefer to describe the ability to negotiate space in variable ways, and the equally variable ways/linguistic means through which people express this, as outcomes of specific forms of (deep) socialisation, in other words, deeply socially or socio-culturally inflected (and also included in that social nexus is the length of time people spend outdoors engaging in physical activity, including games, and the precise nature of those games).   
To be really honest, I really can’t see anything wrong or even problematic in stating that some (groups of) people, as a result of their specific forms of socialisation, have "stronger" or "weaker" spatial senses – perhaps we are becoming too politically correct? It strikes me that using “left” or “right” for direction finding IS in fact a much weaker (i.e. in the sense of less finely-tuned; no moral inflection there) means of negotiating space, in many circumstances, than being able to use the cardinal directions accurately for the same purpose (especially the finer gradations of the cardinal directions - I know which of the preceding ways of navigating space I’d prefer to be able to use proficiently should I become lost in the middle of 360 degrees of desert country, for example in some parts of the Tanami!) In addition, this serves the purpose of challenging the still-prevailing view that Aboriginal people had/have “no” mathematics whatsoever, so it also has a potentially socially beneficial function, in my view.   
But of course, such variable proficiency cannot and should not be extrapolated to ideas about human societies being ‘superior’ or ‘inferior’ to one another; differing societies generate different needs, and as you say differing solutions to their socially- or socio-culturally specific challenges. In other words, different methods of navigating space have highly variable levels ‘use-value’ in locationally- and socially specific circumstances, according to the highly specific sociocultural conditions with which persons need to engage. So I take your point there, if I’ve interpreted what you’ve written correctly. In other words the ethical compass always needs to be factored in, too, and judgments about relative worth suspended, where possible – but, in my view, this shouldn’t rule out stating that certain methods of navigating space prove more efficacious in certain circumstances. It’s a matter of horses for courses.   
In relation to the above, it would be good if you could expand upon your well-made point about the environmentally salient concepts and language used for direction finding. Applying this to the majority of Australians living in cities or large towns, it’s clear that we don’t usually need much more than the cruder left/right formulations, in terms of successfully navigating the built environment on foot. It suffices in terms of getting us around most of the time, and in terms of driving, more recently technology, in the form of the widespread use of GPS in motor vehicles, has come to our aid. In terms of the strength of the dominant society in number, that’s no surprise either, when one considers that we live in a capitalist society.   
I’d also be keen to hear more about the research question that interests you most - of what specific languages are able to contribute to the development of new mathematics. Thank you again for a fascinating and informative post.

about 1 month ago [report](http://theconversation.com/comments/210944/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

Funny what a bit of imagination and enthusiasm can do .... <http://www.abc.net.au/radionational/programs/intothemusic/cape-york-brass/4886124>

As to whether this is a Good Thing - I'll leave that for the less brass-bigotted to judge.

2 months ago [report](http://theconversation.com/comments/207559/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

Frank, You are much better informed than me, and no doubt have a deep understanding of the cultural influences. My perspective is purely pragmatic, based only on the constant flow of reports of disadvantage and failed attempts to overcome the reported problems, and the presumption that the goal is inclusion and equity. There are three instances that I see as offering hope - participation in sport as in the topic, participation in the workforce, and educational systems to enable these and other…

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Frank, You are much better informed than me, and no doubt have a deep understanding of the cultural influences. My perspective is purely pragmatic, based only on the constant flow of reports of disadvantage and failed attempts to overcome the reported problems, and the presumption that the goal is inclusion and equity. There are three instances that I see as offering hope - participation in sport as in the topic, participation in the workforce, and educational systems to enable these and other aspects. The initiatives of Noel Pearson, Andrew Penfold and others provide platforms for the achievement of these goals, and attract support from the wider community. If indigenous groupings do not share these aspirations they will add to the list of failed programs. The preservation of culture is not inconsistent, but must come from within. If there is a strong desire to preserve a particular language, then it will happen, but it would seem that most if not all will fall into disuse in the same way as thousands before them.

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_211677)

John - in terms of what you've written, I know that your intentions are entirely sincere and honourable, but I do need to point out some factual errors in your post as well as comment on your misinterpretation of what I wrote with respect to Noel Pearson, which was most certainly NOT tantamount to a personal attack of any sort.

In addition, I should state from the outset that I fully concur with the points made by Frank Baarda in his earlier reply to your post.

To begin with the factual errors…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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In addition, I should state from the outset that I fully concur with the points made by Frank Baarda in his earlier reply to your post.

To begin with the factual errors evident in your post: the Warlpiri language is neither OBSOLETE, nor is it a DIALECT. It is indeed a living language, as Frank states, and it's the first language of some 3,000 Warlpiri Australians. As an instrument of expression the Warlpiri language is quite up to the task of expressing the nuances of our contemporary world - to an equal extent of any other language, including English. The willingness of almost all Warlpiri, young or old, to become involved with new activities (Facebook; texting on their mobiles etc), and occupations (the police force; rangers; teaching; nursing profession; local councils), provides ample evidence of their desire to engage with the broader world, and their aptitude in that arena.

But, for the most part, with few exceptions, while Warlpiri aspire to such engagement with the broader community, they don’t wish such engagement with the broader Australian community to be at the expense of their own language, of their familial structures and of their unique ways of thinking. To extrapolate from what Frank put so eloquently in his post, Warlpiri are upholding their right to retain their differences in certain ways. It's incredible that in this day and age so many the rest of us are still seem threatened by this proposition.

And to many (actually almost all) Warlpiri, successive governments' denial of the right of Warlpiri children to begin their schooling education in their OWN language, their natal tongue, Warlpiri, the only language, in most cases, that those little kids actually understand when they enter school, has been a step too far in undermining their uniqueness - another retrograde step in what many people already understand to be a coercive "re-education" program rather than education program. On a purely practical level, being subjected to schooling in a language that you don’t understand, from Day One, is enough to turn some children off school from Day One, too. Surely, if an entire community's expectations about their children's early education were to be ignored or rejected wholesale elsewhere in Australia, there would be a public outcry? (If this were happening in a totalitarian regime, we'd ALL be objecting strongly). The UN does in fact uphold the right of children to be educated in their own language, where possible. And Warlpiri is not obsolete by any means - that's the crux of the argument. Were your point about its obsolescence accurate, I's agree with the point you'e trying to make wholeheartedly. But the point is, that is factually incorrect.

It's simply sensible to begin children's education in a language that they understand.

This brings me to the difference between a language and a dialect.

Language: Any set or system of such symbols (communication by voice in the distinctively human manner, using arbitrary auditory symbols in conventional ways with conventional meanings) as used in a more or less uniform fashion by a number of people, who are thus enabled to communicate intelligibly with one another (from Macquarie Dictionary 1981). (c.f. ‘dialect’, which does not constitute a separate ‘language’ but is a variant thereof).   
  
Dialect: a particular variety or a special branch of a language, or the language of a particular region, district or group, which may differ in some respects from the 'standard' language, but does not constitute a distinct or separate language.

Warlpiri is a language, and it has a number of predominantly regionally based dialects, too.

This may seem to be a pedantic or trivial point but it isn't. To describe a living language as an "obsolete dialect" is more than just subtly demeaning language. Notwithstanding its factual incorrectness, it puts an unnecessary ideological spin on the idea of Warlpiri language maintenance, and undermines that legitimate aspiration. Were Warlpiri an "obsolete dialect" it would be an imposition on both children and their teachers to include it in the curriculum (although I haven't heard this said of Latin) rather than just plain common sense.

Besides, what it being advocated by Warlpiri people themselves isn't monolingualism in Warlpiri, but a balanced bilingualism in which both Warlpiri and English are valued, spoken, and written, and used and importantly, respected, as important elements in the education system. On the whole, Warlpiri people do not accept the principle of the worthlessness of either their own language, or by proxy/extension, their own worthlessness, which is why the sustained attempts (primarily but not exclusively through schooling) to render their children monolingual in the English language have failed, and will continue to fail - because of entrenched Warlpiri resistance to this idea/ideal. I think that it's important for others who have strong connections with Warlpiri (e.g. like Frank and myself) to support the Warlpiri in their battle - of not accepting the principle of the worthlessness of their language/selfhood, in relation to English. Both are living languages and both have an important place in the Australian curriculum of the 2000s.

It's important that governments and administrations and their agents/representatives, whether Federal or local, do not continue to regard Warlpiri people as being incapable of knowing what is in their best interests or how to achieve it. A lot of resistance to the ideas introduced by successive govts/administrations has come about on the basis of the failure of government programs (and the programs conceived by government representatives/agents) to recognize local conditions. This is the sole reason why the idea of the government giving someone (whether they are Aboriginal or not) who lives in Cape York jurisdiction over Warlpiri education is ill conceived. This is simply based on a principle - that of the specificity of Aboriginal language/cultural groups. There is nothing personalised about this point with respect to Mr Pearson. But this is an important point, and a point that still needs to be understood by non-Aboriginal Australia - that an Aboriginal person from one particular group cannot speak for/on behalf of another Aboriginal group who lives halfway over the other side of the continent, where conditions are very different. Historically, the assumed superiority of Anglo-Euro-Australian society has offered sufficient justification for its representatives, whether governmental or agents, to be empowered to seek appropriate ‘solutions’ for Aboriginal people and the so-called "Aboriginal problem.’ This thinking is flawed – people need to be given the opportunity to come up with their own solutions to problems, or else it simply won’t work. On another note, the idea of the guru de jour, however clever a person, but who has no real background in education, being given jurisdiction over the educational futures of large and diverse groups of people over the continent seems ideologically, rather than educationally driven.

The most precious gift that non-Indigenous Australia can offer to or bestow upon Aboriginal Australians, is not a monocultural education in the English language, nor more “outside help”, but rather the recognition of very real differences that need to be acknowledged and respected so that people can go ahead in the way they wish, arm in arm as it were. As we move into the future, let's trust Warlpiri to figure out their own ways of going about things educational (which they've already articulated clearly as being based on the inclusion of the Warlpiri language in their children's early years of schooling), rather than endorsing with yet another outside imposition, no matter how well-meaning. Let's stop denying the fact that Warlpiri have already developed capacity in terms of choosing their own preferred educational approaches to their children's schooling, and should be permitted to provide the necessary systemic, organisational and personal input their own children's educational lives.

about 1 month ago [report](http://theconversation.com/comments/211747/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_211747)

Christine and John,   
A propos language/dialect, I read an interview with the late Ken Hale (linguist and polyglot extraordinaire- a fluent Warlpiri speaker) in which he was asked what the difference was. His reply (and I think he was quoting someone else) 'they say that a language is a dialect with an army' Like just about anything, there are shades of grey. Ken Hale further illustrated his reply by pointing out that some of the Italian 'dialects' were linguistically more distinct than the Scandinavian…

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What you discuss is that calling Warlpiri (or any other language for that matter) a dialect implies that there is some sort of linguistic deficiency. It's like the words 'primitive' and 'native' which have come to imply some sort of inferiority.   
A more subtle semantic put down is to talk of "Ancient Cultures' implying an anachronistic adherence to the past. This double edged sword is wielded by many Indigenous Australians themselves that in seeking a recognition that the rest of society is reluctant to give them talk of "A 40,000 year old culture".   
I think I've already quoted the following:   
“Cultural survival is not about preservation, sequestering indigenous peoples in enclaves like some sort of zoological specimens. Change itself does not destroy a culture. All societies are constantly evolving. Indeed a culture survives when it has enough confidence in its past and enough say in its future to maintain its spirit and essence through all the changes it will inevitably undergo. ”   
― Wade Davis, The Wayfinders   
I make no apology for this repetition, our leaders are showing the way by repeating themselves ad nauseum during the current election campaign.

about 1 month ago [report](http://theconversation.com/comments/211776/abuses/new)

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[**Philip Clarke**](http://theconversation.com/profiles/philip-clarke-103291)

logged in via LinkedIn

I enjoyed reading the site and it got me thinking. I have always been uncomfortable with the comments (often from Indigenous people themselves) about Aboriginal people being somehow genetically suited for football. I have always thought that it was in the same category of erroneous thinking as that of Aboriginal people being somehow genetically at risk from alcohol. And the people who utter such things are never interested in the alternative cultural/social explanations.

about 1 month ago [report](http://theconversation.com/comments/215239/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Philip Clarke](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_215239)

An apt comment - to which I'd add, in terms of the overall argument presented here, that it really detracts from a person's achievement in virtually any arena when people attribute that achievement solely to genetic advantage. Likewise, the attribution of genetic risk vis-à-vis alcohol can serve contribute to a sense of powerlessness on the part of people who wish to do something about it, but feel genetically doomed.   
One important strand in this overall discussion has been that of nature vs nurture, but today even the most fundamentalist geneticists see that alternative cultural/social explanations have a significant role to play.

Thank you for your comment Philip, as it's got me thinking further...

about 1 month ago [report](http://theconversation.com/comments/215475/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

My eldest (non-indigenous) son, who had the fortune of learning Warlpiri by immersion as a child, sent me this:

"Interesting article about how language shapes thought:

<http://www.nytimes.com/2010/08/29/magazine/29language-t.html?pagewanted=all>   
This is probably the best article I've seen to point people at rather than try to explain it."

How one plays football is undoubtedly shaped by how one thinks!

Good point Philip re the genetic assumptions.

about 1 month ago [report](http://theconversation.com/comments/215246/abuses/new)

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[**Jonathan Crabtree**](http://theconversation.com/profiles/jonathan-crabtree-103749)

Mathematics Researcher

Dear Dr Nicholls,

Thank you for creating and participating in this important conversation about Indigenous mathematics.

I have been researching the evolution of elementary number theory since the 1980s. While I have considered 16 languages thus far, I am of the view that visual information processing IS as much mathematics as the analytic and symbolic tradition.

My early interest was in learning styles and the popular memes about hemispheric dominance. Yet over the decades my insights have…

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My early interest was in learning styles and the popular memes about hemispheric dominance. Yet over the decades my insights have come via geometry and dreams involving space, astronomy and 'natural' object oriented mathematics.

Once of the misconceptions is that we are born without a number sense. Yet the work of Stanislas Dehaene and others reveals we are all born with a geometric and visual model of mathematics. It is unfortunate Dehaene's book is called number sense as it is not about number - it is about magnitude.

Western mathematics has shifted from 'right brain magnitudinal' perceptions to left brain symbolic representations. Indigenous communities tend to process continuous magnitudes while 'imported' western communities tend to process discrete multitudes.

The main driver between this cultural divide has been the ownership of land, the exchange of goods, initially via barter, then via currency exchange, and the biggest driver, the need for taxation.

Therefore, in my opinion, it is appropriate to draw on ancient Indian practices that may mesh with our Indigenous cultures and mindsets. Measurement by shadow, for example, naturally introduces concepts of similar triangles and this in turn, leads to naive yet powerful models of ratio and proportion that will help Indigenous children 'leap-frog' their western 'counter' parts from reception to year 8.

My goal, which I hope to achieve next year, is to release a series of picture story books about animals in the outback. The illustrations are from my trips to the NT and the pages are 'cartoon' style for easy reading.

While the stories are about a 'walkabout' they are also about friendship and relationships with land, and others. The ideas contained within the stories are based on a primary source audit (from 600 BCE to present day) combined with my personal additions and corrections to what constitutes mathematics.

The eBook for children will be made available at no charge, initially to India's children and our Indigenous children, as it is my sincere hope that all children can come to love mathematics.

Thank you to everyone for sharing their knowledge and may the conversation continue!

Best wishes   
Jonathan Crabtree   
Mathematics Researcher   
Melbourne Australia   
(Currently over at <http://bit.ly/Vrrx9Q>)

about 1 month ago [report](http://theconversation.com/comments/218295/abuses/new)

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[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

In reply to [Jonathan Crabtree](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_218295)

Great thoughts Jonathan.

Sense of place seems to be a central recurring element in this discussion - not a symbolic mathematical or arithmetic construct as we'd recognise it, but a profound understanding of relationships - between landscape and self in particular... like an ehanced peripheral vision absorbing cues and clues we blow-ins don't even notice.

Lots of geometry, angles and data points - less 'inherently' adept on times tables.

The good news today is that the faceless men who run the AFL are putting together a national indigenous team of Top End women. If these young ladies approach the game with a fraction of the enthusiasm shown by their Rugby League counterparts down south, Adam Goodes might have just met his match. Be afraid Adam... be very afraid.

about 1 month ago [report](http://theconversation.com/comments/218406/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Jonathan Crabtree](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_218295)

Thanks for a really stimulating post Jonathan (if I may) - and on that note, please feel free to refer to me as 'Christine' forthwith!

Your comments about geometric and visual models of mathematics reminded me of the long-established cultural links/interrelationships between visual art and mathematics, across a range of very different cultural groups (the Egyptians, Ancient Greeks, Mayans, probably all cultures really). That's something that Molly Gabbard, who has commented here, is interested in pursuing exploring further via research work, because you've brought in some interesting new perspectives. You may also wish to comment on one or more of Molly's posts.

In addition, I fully concur with Peter O's comments about 'sense of place' in response to your post, to which I'll also reply a little later.

Thanks so much for commenting.

about 1 month ago [report](http://theconversation.com/comments/218758/abuses/new)

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Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_218406)

Your comments about 'sense of place', founded on relationships, not only between persons, but between person & place, have resonated deeply with me Peter. And you are right that it has been a deeply recurring theme or perhaps leitmotif this discussion, perhaps somewhat buried under certain other aspects of the discussion, but nevertheless permeating the entire 'conversation'.

This same observation also relates to other earlier comments about deixis. (Deixis - from the Greek: δεῖξις meaning "display, demonstration, or reference")...while the concept of deixis is principally applied to linguistics, it has much wider application, and I think that your comment has led us back to that...

about 1 month ago [report](http://theconversation.com/comments/218766/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Hillary Viljoen**](http://theconversation.com/profiles/hillary-viljoen-104122)

logged in via LinkedIn

The western knowledge system is the only knowledge system which tries to assert that it is the only correct knowledge system. There Re many different ways of knowing things and different knowledges which are useful in different spaces. Students from different backgrounds are taught in different ways and value different ideas. It seems that teachers need to work with the strengths of their students. Adapt lessons and use the students as knowledge holders. This article shows an example of students and young people as holders of a certain type of knowledge, it also shows a way in which we can incorporate different ways of learning about ideas into the curriculum.

about 1 month ago [report](http://theconversation.com/comments/221042/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Hillary Viljoen](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_221042)

A terrific & apt comment Hilary...and yes, 'knowing' is ultimately the outcome of differing processes of cognition, and surely our dominant culture is capable of creating space for the recognition and valuation of alternative ways of 'knowing' - even when (sometimes) these alternative modes of cognition challenge the status quo. This certainly applies to curriculum approaches at all levels, from pre-school to tertiary, as you implicitly suggest.

By recognising genuine differences and ontologies we are able to enter into serious engagement/dialogue with others, and all learn/gain from that experience. Too many people are fearful of the approach you're advocating - but as one American president once said: "We've got nothing to fear but fear itself..."

about 1 month ago [report](http://theconversation.com/comments/222816/abuses/new)

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[**Gail Carnes**](http://theconversation.com/profiles/gail-carnes-98313)

Consultant

In reply to [Hillary Viljoen](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_221042)

Useful knowldge from one space can end up being regretfully lost knowledge in another space. Here's an interesting article: <http://www.nytimes.com/2013/08/11/magazine/the-weather-god-of-oklahoma-city.html?pagewanted=all>

Excerpt: "In the weeks after the May 31 tornado, I kept remembering something Gary England told me in his office. One big regret, he said, is that although he grew up surrounded by Cheyenne people in Seiling, he never asked them about tornadoes. He didn’t know any of the tribes’ severe-weather folklore or survival strategies — the wisdom they must have built up over centuries on the Plains. Greg Carbin, at the National Weather Service, told me something similar. It’s a shame, he said, but not much native lore has survived. Both men had an attitude of sad resignation. Despite all of our Dopplers and Storm Trackers and Dominators, the feeling seemed to be, we have lost the old wisdom forever."

about 1 month ago [report](http://theconversation.com/comments/223483/abuses/new)

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In reply to [Hillary Viljoen](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_221042)

One other important point regarding your post Hilary, which I ought to have said in my first reply to you: I'm in philosophical agreement with everything that you’ve said in it EXCEPT for the first line, which I can't go along with, and therefore need to contest, but of course, explain my reasons. There are (unfortunately) plenty of other human societies in which assertions are made about not only adhering to the 'correct' knowledge system but also, way of living.

Having lived, over the years…

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Having lived, over the years, in several very different cultures, I really can't agree that “the western knowledge system is the only knowledge system which tries to assert that it is the only correct knowledge system” - there exists a good deal of empirical evidence to substantiate my differing view on this matter.

There are, for example, theocracies/dictatorships, whether the latter be comprised of political parties or individuals, in many non-‘western’ societies, that try (often successfully) to impose their views on others & silence/curtail the activities & even the thought of those who hold alternate views, or who disagree with them in ways that limit their freedom of expression in a myriad of ways. It's not even possible to conduct this sort of discussion (except in private) in many parts of the world.

In other words, there are actually human cultures that afford far less room for different views about knowledge/epistemologies than the so-called ‘Western’ cultures - in some instances even where people are slaughtered for simply holding, or being suspected of holding, those differing views.

But I concur with everything else you've written...

about 1 month ago [report](http://theconversation.com/comments/223811/abuses/new)

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[**Jonathan Crabtree**](http://theconversation.com/profiles/jonathan-crabtree-103749)

Mathematics Researcher

Dear friends,

Would somebody please provide an Indigenous set of number words 1-100 from Australia?

I would like to compare with the Huli Indigenous number words of PNG.

Thank you,   
Jonathan Crabtree

Numeral Word   
  
1 mbira   
2 kira   
3 tebira   
4 maria   
5 duria   
6 waragaria   
7 karia   
8 halira   
9 dira   
10 pira   
11 bearia   
12 hombearia   
13 haleria   
14 deria   
15 nguira   
16 nguira-ni mbira   
17 nguira-ni kira   
18 nguira-ni tebira   
19 nguira-ni maria   
20 nguira-ni duria   
21 nguira-ni waragaria…

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18 nguira-ni tebira   
19 nguira-ni maria   
20 nguira-ni duria   
21 nguira-ni waragaria   
22 nguira-ni karia   
23 nguira-ni halira   
24 nguira-ni dira   
25 nguira-ni pira   
26 nguira-ni bearia   
27 nguira-ni hombearia   
28 nguira-ni haleria   
29 nguira-ni deria   
30 ngui ki   
31 ngui ki, ngui tebone-gonaga mbira   
32 ngui ki, ngui tebone-gonaga kira   
33 ngui ki, ngui tebone-gonaga tebira   
34 ngui ki, ngui tebone-gonaga maria   
35 ngui ki, ngui tebone-gonaga duria   
36 ngui ki, ngui tebone-gonaga waragaria   
37 ngui ki, ngui tebone-gonaga karia   
38 ngui ki, ngui tebone-gonaga halira   
39 ngui ki, ngui tebone-gonaga dira   
40 ngui ki, ngui tebone-gonaga pira   
41 ngui ki, ngui tebone-gonaga bearia   
42 ngui ki, ngui tebone-gonaga hombearia   
43 ngui ki, ngui tebone-gonaga haleria   
44 ngui ki, ngui tebone-gonaga deria   
45 ngui tebo   
46 ngui tebo, ngui mane-gonaga mbira   
47 ngui tebo, ngui mane-gonaga kira   
48 ngui tebo, ngui mane-gonaga tebira   
49 ngui tebo, ngui mane-gonaga maria   
50 ngui tebo, ngui mane-gonaga duria   
51 ngui tebo, ngui mane-gonaga waragaria   
52 ngui tebo, ngui mane-gonaga karia   
53 ngui tebo, ngui mane-gonaga halira   
54 ngui tebo, ngui mane-gonaga dira   
55 ngui tebo, ngui mane-gonaga pira   
56 ngui tebo, ngui mane-gonaga bearia   
57 ngui tebo, ngui mane-gonaga hombearia   
58 ngui tebo, ngui mane-gonaga haleria   
59 ngui tebo, ngui mane-gonaga deria   
60 ngui ma   
61 ngui ma, ngui dauni-gonaga mbira   
62 ngui ma, ngui dauni-gonaga kira   
63 ngui ma, ngui dauni-gonaga tebira   
64 ngui ma, ngui dauni-gonaga maria   
65 ngui ma, ngui dauni-gonaga duria   
66 ngui ma, ngui dauni-gonaga waragaria   
67 ngui ma, ngui dauni-gonaga karia   
68 ngui ma, ngui dauni-gonaga halira   
69 ngui ma, ngui dauni-gonaga dira   
70 ngui ma, ngui dauni-gonaga pira   
71 ngui ma, ngui dauni-gonaga bearia   
72 ngui ma, ngui dauni-gonaga hombearia   
73 ngui ma, ngui dauni-gonaga haleria   
74 ngui ma, ngui dauni-gonaga deria   
75 ngui dau   
76 ngui dau, ngui waragane-gonaga mbira   
77 ngui dau, ngui waragane-gonaga kira   
78 ngui dau, ngui waragane-gonaga tebira   
79 ngui dau, ngui waragane-gonaga maria   
80 ngui dau, ngui waragane-gonaga duria   
81 ngui dau, ngui waragane-gonaga waragaria   
82 ngui dau, ngui waragane-gonaga karia   
83 ngui dau, ngui waragane-gonaga halira   
84 ngui dau, ngui waragane-gonaga dira   
85 ngui dau, ngui waragane-gonaga pira   
86 ngui dau, ngui waragane-gonaga bearia   
87 ngui dau, ngui waragane-gonaga hombearia   
88 ngui dau, ngui waragane-gonaga haleria   
89 ngui dau, ngui waragane-gonaga deria   
90 ngui waraga   
91 ngui waraga, ngui kane-gonaga mbira   
92 ngui waraga, ngui kane-gonaga kira   
93 ngui waraga, ngui kane-gonaga tebira   
94 ngui waraga, ngui kane-gonaga maria   
95 ngui waraga, ngui kane-gonaga duria   
96 ngui waraga, ngui kane-gonaga waragaria   
97 ngui waraga, ngui kane-gonaga karia   
98 ngui waraga, ngui kane-gonaga halira   
99 ngui waraga, ngui kane-gonaga dira   
100 ngui waraga, ngui kane-gonaga pira

The logical fun fast and easy way to count 1-100 is

one   
two   
three   
four   
five   
six   
seven   
eight   
nine   
onety (one ten) then cycle the digit words   
twoty   
threety   
fourty   
fivety   
sixty   
seventy   
eighty   
ninety   
one hundred

So once indigenous children learn 'ty' and 'hundred' they can count 1-100 with just onety-one (eleven) words. After number confidence is gained (regained) then the 'adult' words of eleven twelve and so on can be introduced alongside the backwards, dyslexic dynamite' teens.

A made a video of the extended concept for Indigenoue kids after I made a couple of trips hiking around the NT. You might be amongst the first twoty to watch it! <https://www.youtube.com/watch?v=NiTqn45x4UI>

I have also uploaded an intra-numeric font to help Indigenous children. <http://jonathancrabtree.com/fonts/Little%20Math%20www.podometic.com.ttf>

about 1 month ago [report](http://theconversation.com/comments/222854/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

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Farmer

In reply to [Jonathan Crabtree](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_222854)

Here's a scrap from Alfred Howitt's work down in Victoria... <http://en.wikipedia.org/wiki/Australian_Aboriginal_enumeration>

The neat thing about this is the insertion of the 'everyday' meaning of the word and its context beyond the abstraction of numbers.

Seems to vary widely depending on who and where and the sort of lives being led. I've encountered heaps of contradictory information on this from a range of sources.

I'd suspect that precision in quantifying numbers - counting - is of little significance or value in many places - the Tanami comes to mind - unless you want to count stars... whereas folks engaging in trade, 'mass production', dealing with larger bunches of stuff might have more use for such precision.

There's more of this at the IATSIS site from memory where there is a decent pile of recorded language from all sorts of places ... try here: <http://www.aiatsis.gov.au/research/language.html>

Be quick before they are shut down.

about 1 month ago [report](http://theconversation.com/comments/222866/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Jonathan Crabtree](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_222854)

Hello Jonathan, in terms of responding adequately but briefly, this is a little tricky on several fronts, but I'll do my best to respond as well as I can, in the circumstances.

First - of course our dominant culture numerical system is Base 10. To my knowledge NO Indigenous Australian numerical system is Base 10 (which of course doesn't mean that Aboriginal people who still speak their languages can't count to 100 in their languages), which in part accounts for the disparaging comments of some…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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First - of course our dominant culture numerical system is Base 10. To my knowledge NO Indigenous Australian numerical system is Base 10 (which of course doesn't mean that Aboriginal people who still speak their languages can't count to 100 in their languages), which in part accounts for the disparaging comments of some non-Aboriginal people about (the supposed lack of) Indigenous maths - because those colonists and their descendants were/are unable to recognise non-base 10 counting systems, and as result promulgated Aboriginal inadequacy/inferiority in that area.

Another complication is that BC ('Before Cook') there were 250 separate Indigenous Australian language/cultural groups, some of which were/are quite different from each other in terms of number/counting systems and some (well, probably many) used Base 5; others Base 2 and so on. So to draw up a list as you suggest one would have to choose a particular language group - i.e. there isn't just one Aboriginal language which could be deemed to represent all others in terms of counting/number.

The other thing to take into consideration is that in terms of traditional life, Aboriginal groups had little/no need for counting to thousands/millions etc etc. As this article suggests, such societies are/were very strong in the area of spatial relationships founded on cardinal directions, and this plays itself out even today in certain Aboriginal visual artworks/as well as on the AFL and other playing fields where such intellectual skill can buttress the necessary physical skills to play such games.

So, with all of these provisos in mind, here are a couple of papers that you might like to read which will provide you with a bit more direction in terms of your original question:

\* Stokes (1982) wrote an article about Anindilyakwa (one of the languages spoken on Groote Eyelandt) maths - this is worth reading (will send you the full reference if you wish);

\* John Harris wrote an article 'Australian Aboriginal and Islander mathematics' which I believe is available online I believe (in Australian Aboriginal Studies 1987/no. 2; pp 29-37).

I feel sure that Michael Christie (who is cited in John Harris's article) has also written in this area, and equally certain that Cris Edmonds-Wathen has also published something that would be very useful for you in terms of following-up.

Both have posted comments on this site so let's hope that they read this and will post up some more references for you/responses to your post...

about 1 month ago [report](http://theconversation.com/comments/222881/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jonathan Crabtree**](http://theconversation.com/profiles/jonathan-crabtree-103749)

Mathematics Researcher

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_222881)

Thank you Peter and Christine for your informative replies.

The Indigenous Huli example I provided is base 15.

The French us a combo base ten/base twenty system.

In French, sixty is soixante, seventy is soixante-dix (sixty ten) and 99 is quatre vingt dix neuf (four twenty ten nine).

Hindi 1-100 is a real mess! There's almost 100 different sounds to master, and the Indians invented zero as a number and our positional base ten system.

Ideally, I would like to know if there if there are any examples of combinatorial number words in an Indigenous language, in which numerals are recycled in the system, whether it be base 2, 5 or anything else.

Thank you both for your interest.   
Best wishes   
Jonathan

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Jonathan Crabtree](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_222854)

Jonathan,   
As far as I can tell Warlpiri had only 'jinta'(1), 'jirama(2), mangkurpa(3) and I have heard 'jirama kari jirama kari used (2 & 2) for four.   
I'm not exactly sure when "rdaka' (hand) came into common usage for five. When bilingual education was introduced (1974) Yuendumu Warlpiri School staff formalised Warlpiri numbers nomenclature and added: 'jika'(6) 'wilki' (number seven boomerang) (7), 'milpa' (eyes) (8), 'nantingki' (9), kalala (10), kalala-jinta (11) and so on. Some of these are…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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Listening to Warlpiri conversation, English numerals can be heard (albeit pronounced with a Warlpiri accent). The lack of lists from 1-100 in Australian Aboriginal languages is a bit of a furphy. Older Warlpiri people with very limited English and that have never been to a 'western' school, are often able to make complicated calculations when handling money and ensuring they get the right change. Watching Warlpiri people play card games that require addition, shows that the limited numerical nomenclature in their mother tongues is no barrier to rapid arithmetical computation.   
As for 'borrowing' English nomenclature, this should not be held against these languages. Just think about it, English vocabulary consists almost entirely of borrowed words.

about 1 month ago [report](http://theconversation.com/comments/222909/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_222909)

Frank - at Lajamanu 'murntu-pala' was used by Warlpiri people for the number 4 - which as you know means something along the lines of kneeling, or sitting on your knees, squatting etc - I guess that's a way to "double" your two legs, by making four halves thereof, when I think about it. Murntu-pala could have been introduced post-colonisation to represent the no. 4, which, if so, exemplifies something else of significance - the capability of these languages to adapt to and express new phenomena...

about 1 month ago [report](http://theconversation.com/comments/222992/abuses/new)

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[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_222992)

Thanks for that bit of etymological information. My Warlpiri is far from good and I didn't know where 'murntu' came from.   
Murntu is the Warlpiri word fairly commonly used for the no.4. The jirama-kari jirama-kari I referred to was pre-bilingual education programme.   
All languages are capable of adaption and embracing and expressing new concepts. These make for interesting and sometimes amusing examples. Years ago I heard matches referred to as 'lujufu' which when you think about it is derived from…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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All languages are capable of adaption and embracing and expressing new concepts. These make for interesting and sometimes amusing examples. Years ago I heard matches referred to as 'lujufu' which when you think about it is derived from 'lucifer' which is the Dutch word used for matches and most probably also old-German. I suspect 'lujufu' comes from the Lutheran Mission at Hermannsburg (present day Ntaria).   
Another old fellow wanted to buy a 'pipiti'. When I asked what he meant someone told me it was a word formerly used for 'bag of flour'. Why? Because flour used to come in 50 pound bags.   
And Jonathan, you refer to the French 4x20. The French speaking Swiss and Belgians will have none of that! It is (and forgive my spelling) septante, huitante and nonente.

about 1 month ago [report](http://theconversation.com/comments/223036/abuses/new)

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Farmer

G'day Christine ...

Got thinking about language and big numbers and lying in a swag in the Tanami counting stars ... and I remembered this lot... a sense of place and a sense of space [...http://aboriginalastronomy.blogspot.com.au/](http://theconversation.com/...http:/aboriginalastronomy.blogspot.com.au/)

Useful teaching aids and images abound ...

about 1 month ago [report](http://theconversation.com/comments/225846/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_225846)

Good morning Peter.

You're right to suggest that the matter of Indigenous strength in terms of astronomical knowledge is highly relevant to the discussion about the primacy of spatial relationships and cardinal directions in Aboriginal maths, and the language/linguistic terminology that accompanies that.

Of course this ability was strongly reinforced in situ, in the days when people routinely slept outdoors (in the Tanami, for example) with the stars their only canopy (in good weather anyway…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Good morning Peter.

You're right to suggest that the matter of Indigenous strength in terms of astronomical knowledge is highly relevant to the discussion about the primacy of spatial relationships and cardinal directions in Aboriginal maths, and the language/linguistic terminology that accompanies that.

Of course this ability was strongly reinforced in situ, in the days when people routinely slept outdoors (in the Tanami, for example) with the stars their only canopy (in good weather anyway, but probably sometimes in bad weather too). There were strict rules too, which are still followed when people sleep outdoors – with people's heads are to the east, with legs/feet extended to the west. Moreover, the arrangement of sleeping people in (well-ordered) rows was/is subject to kinship regulations.

I remember quite well that the matter of where exactly each individual should sleep always generated quite a lot of discussion when I went out with groups of Warlpiri people and we slept ‘out’ in the Tanami – their backyard.

All of this of course points to a highly organised/systematic approach to the intellectual matters that underpinned survival in what most people would regard as inhospitable, if not outright hostile, desert terrain…

Thanks very much Peter for your posts – this discussion is a bit akin to the Magic Pudding in the way that it periodically regenerates. I think that’s because this is an important ongoing discussion that all Australians need to have, which also explains why it covers so many interrelated matters…

29 days ago [report](http://theconversation.com/comments/227579/abuses/new)

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[**Hillary Viljoen**](http://theconversation.com/profiles/hillary-viljoen-104122)

logged in via LinkedIn

We clearly need a curriculum which praises the difference in people rather than punish them for it. Clearly the way in which Indigenous young people learn about space and places is different and more effective than the way in which we are trying to teach it in the classroom. Working with the strengths in students would make classrooms better environments for learning. There needs to be more focus on authentic and deep learning rather than such a focus on results and grades.

about 1 month ago [report](http://theconversation.com/comments/226094/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Hillary Viljoen](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_226094)

Thank you for this significant comment, Hillary.

Yes - and this begins with something as basic as the need for acknowledgement in Australian classrooms of Indigenous children's/young people's first languages, where they are still spoken. That’s the greatest strength that little kids can bring to the classroom from their very first day of school.

In another context, Barbara Baloyi, a South African school teacher and speaker of five African languages, has written:

"So far, the education…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thank you for this significant comment, Hillary.

Yes - and this begins with something as basic as the need for acknowledgement in Australian classrooms of Indigenous children's/young people's first languages, where they are still spoken. That’s the greatest strength that little kids can bring to the classroom from their very first day of school.

In another context, Barbara Baloyi, a South African school teacher and speaker of five African languages, has written:

"So far, the education in South Africa has managed to privilege English and speakers of English...even worse, it has privileged European conceptions of knowledge and cultures at the expense of indigenous cultures in the country. The experience of the European child has been validated in the school classroom and curriculum. This view of English learning as natural, neutral and beneficial seems to prevail amongst English teachers" [in South African schools]. (cited in Cope and Kalantzis, Multiliteracies: Literacy Learning and the Design of Social Futures, Macmillan, 2000, 304-305).

There are a couple of really salient points made in this brief excerpt, the first and most important being that Barbara Baloyi isn't arguing AGAINST English being a significant part of the curriculum, but just stating that other languages need to be given space, too - which as you rightly say would allow ALL children to bring their strengths to classrooms.

Sound familiar? There's a strong analogy here to the continuing suppression of Indigenous Australian languages in all-Indigenous classrooms in the Northern Territory, today. But learning in one's own language (initially, at least) is fundamental in terms of not only recognition of "the strengths" of children, but also as you rightly say, instrumental in making "classrooms better environments for learning."

Finally, as the late Douglas Adams (‘Hitchhikers Guide to the Galaxy) said in a very different context (he was talking about print literacy in relation to/compared with e-books and e-literacy) “Lovers of print are simply confusing the plate for the food.”

It’s time to stop confusing the plate for the food, and equally, to start ‘sharing the space’ – in the curriculum, both in Australian classrooms and in other aspects of our daily lives.

29 days ago [report](http://theconversation.com/comments/227605/abuses/new)

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[**Claire Bockner**](http://theconversation.com/profiles/claire-bockner-46934)

logged in via email @bigpond.com

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_227605)

How lovely, Christine, to see you quoting Douglas Adams. If only we had his Babel fish, that translate any language into the wearer's own language, then this discussion would be obsolete! But that's fiction...

I so agree with you that the argument isn't about Australian languages versus/or English but that starting children's education in their mother tongue and introducing English gradually for a full bilingual education makes so much sense.

17 days ago [report](http://theconversation.com/comments/235213/abuses/new)

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[**Arisa Suizu**](http://theconversation.com/profiles/arisa-suizu-106218)

Japanese student

I was surprised that indigenous Australian people have great ability in mathmatics and even small children learned mathmatical skills. I did not know this. But I think it is natural that ancient people had lived by making must of their ability to calculate because they did not have any weapon to survive and had to survive by utilizing natural materials.   
In connection with the other ancient civilization such as Rome and India, I think people needed to improve their ability to calculate. All of them had good ability to calculate.   
Also, it will be a opportunity for indigenous Australian people to live better. People will respect them by know they have had the great ability which is useful modern society.

14 days ago [report](http://theconversation.com/comments/236512/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Arisa Suizu](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_236512)

Arisa-san: you are the first Japanese student (or even Japanese person!) to post in this site, so a warm welcome to this conversation!

All human cultures possess mathematical abilities and have the ability and wherewithal to undertake mathematical computations, although sometimes this occurs in very different ways that are not necessarily understood, intelligible, or appreciated by those whose cultural expressions of mathematics are very different from other cultures.

I thank you for your comment very much, and would like to hear more from you about Japanese mathematics...is it largely based on number (as I would assume)?

I'm interested to hear more from you, as I'm sure the other people reading what you've written, are too...

14 days ago [report](http://theconversation.com/comments/236518/abuses/new)

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[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

Arisa - You would be advised to question the validity of claims before accepting versions that are little more than opinions. Many of the views put forward in this exchange are from well intended people who are passionate about the issue. Mathematics is science, and beyond the ambit of individual cultures.

13 days ago [report](http://theconversation.com/comments/237177/abuses/new)

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Farmer

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_237177)

How do you feel about geometry John?

13 days ago [report](http://theconversation.com/comments/237179/abuses/new)

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[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_237177)

Dear John,

It's important to be explicit in your critique, rather than just extending your critique in generically critical ways as a means of invalidating the views of unnamed but nevertheless identifiable people (as a means of attempted management of the national conversation space about this matter, & as an attempt to control who is "really" able/qualified to make a 'valid' commentary on such matters). If you genuinely feel that your qualifications/knowledge of this area is/ are superior to…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Dear John,

It's important to be explicit in your critique, rather than just extending your critique in generically critical ways as a means of invalidating the views of unnamed but nevertheless identifiable people (as a means of attempted management of the national conversation space about this matter, & as an attempt to control who is "really" able/qualified to make a 'valid' commentary on such matters). If you genuinely feel that your qualifications/knowledge of this area is/ are superior to those who have already commented, then you need to attest to those claims in specific ways, along with citing the research that allows you to make such claims.

This is what I've been prepared to do in posting this piece.

You will also need to explain exactly how you differentiate 'opinion' in relation to this discussion (which I take to be the foundation of your commentary; i.e. your veiled assertion that this is an 'opinion piece' rather than based on valid research in the areas of linguistics and mathematics as it has been - when the sources have been named) when you haven't offered any real evidence-based research to support your own opinions. How I personally differentiate 'opinion' with respect to the foregoing is when I read assertions that are unsubstantiated by any research. Thus I make my position clear, and you need to do so, too.

What I find unacceptable about this approach is:

\* you haven't proffered any substantive research to substantiate your firmly held opinion;

\* and also troubling in this response and earlier ones are the veiled ad hominem [and ad feminem attacks; so to speak, if you'll forgive my Latinate neologism] on persons unnamed, but lacking detail - just vague;

It is wonderful that a young Japanese student has commented on this post; but you have had ample time to critique it prior to this time with some real evidence.

It strikes me that ethnocentric views of what constitutes maths are now well and truly outdated; we have gone beyond western versions of maths (without rejecting them of course), ie well beyond maths as purely founded on number, to include spatial relationships and many other mathematical expressions - and this is now accepted by the mainstream.

The views that I'm expressing are not the domain of passionate ideologues as you seem to be stating, but well accepted now.

That's why no mathematician or linguist involved in this area has objected to this post - and why the discussion keeps going...

With respect,

CN

12 days ago [report](http://theconversation.com/comments/238031/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

Peter - I'm not sure of the intent of the question, but geometry is one of the inter-related streams that are the collective product of the worlds greatest minds regardless of race or creed.

12 days ago [report](http://theconversation.com/comments/237591/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_237591)

The question was based on the fact that Aboriginal peoples seem to have a quite profound understanding of geometry ... of the relationships of angles and areas ... it's all over their art and their artefacts... it's also reflected in how they perceive themselves in space be it the bush or the footy field. This is what I took to be the main thrust of Christine's article in fact ... not maths per se in the sense of times tables and arithmetical calculations, but somewhere to work from and something we too could benefit from understanding.

Maths isn't just a 'science' ... it's full of absurdities and contradictions and strange complex relationships ... quite beautiful in fact ... and a lot of evidence suggests that these abstractions of maths are not too far removed from the concepts of at least some Aboriginal folks.

And I'd agree entirely about the world's greatest minds... and some of them were here... not dumb but different and that's a very precious thing.

12 days ago [report](http://theconversation.com/comments/237607/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Niki Vouis**](http://theconversation.com/profiles/niki-vouis-106397)

Arts and Cultural Officer

Thank you Christine for an insightful article. One message that rings true for me here is the importance of integrating our children's mother culture and knowledge into our children's formal learning.   
I can imagine that if the maths taught when I was at school involved alternatives to a myriad of equations, I may have excelled. I gave maths up after year 10.   
Sadly I know very little about AFL. Only that the sheer balletic nature of the game recently stopped me in my tracks when walking past the tv while several family members watched the finals.   
I get the connection.

12 days ago [report](http://theconversation.com/comments/238027/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Niki Vouis](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_238027)

Thank you Niki for your thoughtful and considered response. Your words about the need for a strong connection between the mother culture and by extension, the use of the mother tongue where possible, in early learning in particular, go to the heart of the matter.

Equally, and sadly, what you've said about your own experiences of learning maths are still all too common amongst school children, girls in particular. It points to the need for teachers to be creative and imaginative in order to reach children who may be highly intelligent but can't be reached by standard curriculum approaches. Alternative pathways need to be actively sought and incorporated into the curriculum to reach ALL of the kids in the class. Not to do this implies a failure of the imagination on the part of teachers.

Thank you for your post.

7 days ago [report](http://theconversation.com/comments/240727/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**John Clark**](http://theconversation.com/profiles/john-clark-11419)

Manager

Christine - mea culpa. My comment was indeed opinion. I am neither a mathematician or a linguist. It was prompted by my concern that so little progress is being made in "narrowing the gap". It seems that each time we (as a Nation) introduce another initiative, the goal becomes more elusive. By co-incidence, I watched the Q & A presentation last night, where the expert panel tried to project optimism, while being so obviously pessimistic. I admit this diverges from the topic, but my view (opinion) is that we should be looking for inclusion rather than separatism. By all means maintain culture and language in the home and communities, but direct public effort to seamless inclusion.

11 days ago [report](http://theconversation.com/comments/238182/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_238182)

Thank you John for your good grace in responding. In a sense your comment does NOT stray from the topic, which centres on recognition of Indigenous prowess and ways-of-being-in the-world.

From my own experience of living with Warlpiri people for many years, most Warlpiri people do want inclusion in the 'imagined community' called Australia (cf Benedict Anderson) in the semaless way that you suggest, but they don't want that to be at the expense of their own language and culture, and they want…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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From my own experience of living with Warlpiri people for many years, most Warlpiri people do want inclusion in the 'imagined community' called Australia (cf Benedict Anderson) in the semaless way that you suggest, but they don't want that to be at the expense of their own language and culture, and they want to be able to exert control over their own children's ways-of-being in the world, as most of us do.

This means that we all, on both sides of the colonial divide, need to step back a bit and be prepared to accept some level of compromise. For those of us who are non-Indigenous Australians, it means learning to listen. Too many of us have our own so-called 'solutions' to the so-called 'Aboriginal problem' and push them with evangelical zeal. Indigenous peoples tend to classify it as 'the white problem' and a strong point is to be made there.

If Indigenous aspirations were to be factored in to the closing the gap discussion, and we were prepared to listen intently to those ideas, the 'closing the gap' idea (which at present is pretty much only a mantra) might actually have some purchase, & eventually become realisable. At present, only a handful of Indigenous people are being listened to, and they are the persons whose ideas 'chime' most sonorously with politicians on both sides of the political fence. Those Aboriginal people's views are not necessarily representative of majority Indigenous views, and that's problematic.

To become aware of a greater range of Indigenous views, you could check out Stephen Hagan's daily newsletter on Indigenous affairs. I can provide the website if you wish.

'Closing the gap' requires effort on both sides, and changed behaviour on both sides, not just one party pitching itself as having all of the answers, and expecting the other party to take all of those other ideas on board...

Thank you very much for your post.

7 days ago [report](http://theconversation.com/comments/240723/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [John Clark](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_238182)

Hi John, I agree with Christine, you have NOT diverged from the topic. I also watched Q&A, mainly as I was interested to know more about where Warren Mundine was 'coming from'. Warren has replaced Noel Pearson as the most socio politically powerful Aborigine when it comes to matters affecting the First Australians.   
I hope he isn't used as much as Noel has been in terms of being quoted out of context to suit the assimilationist paradigm. When Noel speaks out about the scourges of passive welfare…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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I hope he isn't used as much as Noel has been in terms of being quoted out of context to suit the assimilationist paradigm. When Noel speaks out about the scourges of passive welfare or substance abuse he is loudly applauded and publicised. When he speaks up about the importance of language in education and self-determination and against the NT Intervention, you virtually have to read between the lines.   
As someone that lives in a Warlpiri place, I concur with Christine's comment on your post. I think it is important that these discussions take place and that different opinions are invoked. We may not agree with each other but we have concern and interest in common, also I hope we have the ability to modify or change our beliefs. As for the criticism that these discussions mainly take place amongst non-Aboriginal people, I know for a fact that many Warlpiri people think deeply about the White-Problem and have opinions etc. I also know that their opportunities to express themselves to outsiders are severely limited and they are not listened to or heard or understood by those people empowered to run their lives.   
This is how we 'loud whitefellows' justify our non-silence, however frustrating our pissing into the wind can be, and we are not averse to use counter-propaganda techniques.   
I've heard these bureaucrats and politicians called 'langa pati' (langa means ears and 'pati' is hard compacted impenetrable soil). Also in the Warlpiri language 'warungka' means both deaf and stupid (i.e. the same word is used to describe someone that doesn't hear as someone that doesn't listen). I know, unfair on deaf people.   
Regarding the Closing the Gap mantra, it is an expression of the ethnocentricity that we all more or less suffer from. The Gap has been defined by mainstream powers that be. It is to some extent a straw man, or at its more charitable Closing the Gap is an expression of good intentions. I much prefer "Bridging the Gap"   
The Gap of mutual respect and understanding.   
Incidentally Warren Mundine himself got a laugh (on the 'Observer Effect' TV programme) out of Gary Foley calling him "the white sheep of the family"

7 days ago [report](http://theconversation.com/comments/240749/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Frank Baarda**](http://theconversation.com/profiles/frank-baarda-3735)

Geologist

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_240749)

I know, bad form replying to myself!   
Never let an opportunity go by to help to dispel the myth that Aboriginal languages are somehow 'primitive' simple and no more than dialects of each other. Also not really off topic when one considers how intertwined mathematical thinking is with language (all thinking actually when you think of it). I don't think it is entirely coincidental that a friend of mine started his academic career as a mathematician and is now a linguist.   
A propos 'langa pati' (see…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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A propos 'langa pati' (see above), I recently was listening to a conversation in Luritja (a language for which I only know a smattering of words) when I heard the phrase 'pina pati'. I interrupted the conversation to ask what it meant- It means "no good ears, they don't listen" I was told. A common metaphor, a common word, and two completely different words for ears.   
The Luritja speakers' conversation was about a child taken from its parents by the authorities. No prizes for guessing who the pina-pati might have been. The new Protectors!

7 days ago [report](http://theconversation.com/comments/240806/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Frank Baarda](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_240806)

Not bad form at all Frank...you always have something to say that we all of which we should take heed...will respond in full, very soon...

7 days ago [report](http://theconversation.com/comments/240869/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Peter Ormonde**](http://theconversation.com/profiles/peter-ormonde-7834)

**[Peter Ormonde is a Friend of The Conversation.](https://donate.theconversation.edu.au/?dt=friend_of_the_conversation_badge_7834)**

Farmer

G'day Christine,

You will enjoy this I think: <http://www.abc.net.au/radionational/programs/ockhamsrazor/maths-is-everywhere/5028094>

Not bad for a Hawthorn supporter.

7 days ago [report](http://theconversation.com/comments/240691/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Peter Ormonde](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_240691)

Peter - thank you for drawing it to my attention. Although it had limitations (of an ethnocentric nature) I thought that the overarching concept - ie that maths IS everywhere - was an excellent one, and one that needs to be promulgated more actively/vigorously, in which case stories of kids turning off maths in schools might become a thing of the past (pace Niki's story of several days ago).

I've just put up a response on the Ockham Razor's site, not criticising the program, but drawing attention to the fact that you've posted on it here Peter, and providing this website for anyone there who might wish to follow up.

Thanks a million for drawing it to my attention.

7 days ago [report](http://theconversation.com/comments/240734/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Eva Cox**](http://theconversation.com/profiles/eva-cox-1012)

Professorial Fellow Jumbunna IHL at [University of Technology, Sydney](http://theconversation.com/institutions/university-of-technology-sydney)

I heard the Ockham's which failed to recognise other forms of counting, so was thinking someone ought to contact Robyn Williams and offer another version? Chris, are you interested?   
eva

7 days ago [report](http://theconversation.com/comments/240718/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Eva Cox](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_240718)

Yes, I think that's a worthwhile idea Eva, and someone should do it...let's see what happens after someone reads this post.

I'm off to China tomorrow, but that doesn't exclude doing something along those lines in the future - perhaps with a panel of people rather than just one individual, such as moi!

Are you interested?

And how about some of the mathematicians who work in cross-cultural contexts?

7 days ago [report](http://theconversation.com/comments/240737/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Eva Cox](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_240718)

PS and of course, most importantly, I could provide, if necessary the names of many Warlpiri men and women, amongst whom most have worked in the education system but are now retired, who could discuss Warlpiri maths on such a program.

I'll only be away for a week, and receiving emails, & I feel that this would be a very worthwhile thing to do...

Thanks for the suggestion Eva.

7 days ago [report](http://theconversation.com/comments/240739/abuses/new)

1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jonathan Crabtree**](http://theconversation.com/profiles/jonathan-crabtree-103749)

Mathematics Researcher

Dear Christine and friemnds,

Just to let you know, I have almost finished fixing arithmetic. It has been broken since the 16th century in particular courtesy of the British. It has taken me a long time, as I have had to review the evolution of arithmetic in 16 languages. I began in 1983!

I am in the final stages of cross-checking the original Sanskrit of Brahmagupta to compare and contrast with the Ancient Greek of Euclid, the Arabic logic of Al Khwarizmi and the cool ideas of Isaac newton…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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My new system, called Podometic, uses a lot of spacial concepts and colour and by being geometrical in nature is like a WYSIWYG form of mathematics when most people dive into the source code with algebra. As my free cartoon eBooks are illustrations of outback Australia, I expect they may appeal to our indigenous children.

So my question is, how do I introduce myself to a principal of a remote school so my eBooks and games can be tested with spacially aware indigenous children?

My new math will appear late 2014 as my current priority is to get a paper published so I might have some 'cred' behind me.

For the record, I first began to make newspaper headlines about maths in the 1980s. More recent articles can be seen at:

<http://hobsons-bay-leader.whereilive.com.au/news/story/saeholme-man-dogged-determination/>

<http://www.indianlink.com.au/epaper-archive/IL-SYDNEY-May2-11/38.htm>

If any principals of outback indigenous schools are interested in giving me some feedback, please message me via LinkedIn at <http://j.mp/jcrabtree> (to help me avoid spam) or email 'podometic at gmail dot com'

Thank you.

Best wishes   
Jonathan Crabtree   
Mathematics Researcher   
Melbourne Australia   
(Currently over at <http://bit.ly/Vrrx9Q>)

7 days ago [report](http://theconversation.com/comments/240757/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Jonathan Crabtree](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_240757)

Dear Jonathan,

I've read your post carefully and thoughtfully, as well as checking out the web-links that you've provided, in depth. It's taken me a while, as I'm not currently in Australia.

My sincere feeling is that before discussing your ideas (as outlined in these links) with remote area Principals of Indigenous schools, and sharing the considerable research effort you've put into developing these ideas with them, the most important thing you should do is to begin discussing your approach…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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My sincere feeling is that before discussing your ideas (as outlined in these links) with remote area Principals of Indigenous schools, and sharing the considerable research effort you've put into developing these ideas with them, the most important thing you should do is to begin discussing your approach with Indigenous people who are well qualified to give you feedback.

Many principals of remote Aboriginal schools are 'newbies', and sadly, do not always necessarily possess the linguistic skills or cross cultural skills to judge approaches such as yours. It would therefore, I believe, be preferable for you to discuss what you've been doing and advocating with Indigenous educators for the initial round of feedback...there would be many people reading these posts who may also wish to comment.

There's also the issue of ensuring that what you're advocating is consonant with the mandated curriculum approaches in each state, so it may be worth getting in touch with AITSL - which welcomes feedback from people about their curriculum approaches (you can find them online).

Other readers I'm sure will also comment.

In the meantime I wish you well in every respect with your ambitious endeavour...please let me know your thoughts.

Good wishes,

Christine

1 day ago [report](http://theconversation.com/comments/244460/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Jonathan Crabtree**](http://theconversation.com/profiles/jonathan-crabtree-103749)

Mathematics Researcher

In reply to [Christine Nicholls](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_244460)

Thank you Christine

I couldn't register to explore the AITSL website as I am not a teacher at an Australian school.

The ideas I can share are for the 'additional' enjoyment of children and parents. The new national mathematics curriculum does not teach my ideas and I am not advocating a formal replacement curriculum for schools as bureaucracies don't work that way.

My experiential games are along the lines of:

Grade 1 How tall is that tree?   
Grade 2 How do you mark a stick five arms long…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

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My experiential games are along the lines of:

Grade 1 How tall is that tree?   
Grade 2 How do you mark a stick five arms long to cut it into exact equal lengths for seven people? (Without a ruler.)   
Grade 3 Explain why negative two multiplied by -3 equals six.   
Grade 4 Teach kids in Grade 2 their times tables in 10 minutes.

Grade 1 Game 1. Lie down in the dirt and measure how tall you are from the bottom of your feet to the top of your head. Scratch the ground with a stick to mark both the top of your head and the bottom of your feet. If possible cut a piece of string that measures your height. In either mid morning or mid afternoon your shadow will be the length of your string. Your shadow will be as long as you are tall! So count the steps you walk under the shadow of a tree, as that will be the height of the tree!

From this fun outdoors activity, you can make a shadow stick of any length. Whenever the shadow of the stick matches its height, all the shadows cast by the sun are the height of the objects that produce them.

From this, children can easily understand the property of similar triangles and can measure pretty much anything.

So I would ultimately expect my ideas to be projects or 'modules' that might be of remedial benefit for children who cannot connect the mainstream mathematics pedagogies with their natural surroundings.

A day digging holes in Grade 3 will be more than enough for children to understand integer logic and explain it so high school math teachers understand basic number theory through new eyes.

I like Isaac Newton. Any guy that goes from an apple falling from a tree to working out the laws of the universe is kind of cool. So it was fun to read Sir Isaac Newton's handwritten notes (in Latin) to see how he explained simple arithmetic. Guess what? His simple explanation of multiplication wasn't in my maths books growing up and I wish it was! A friend of his, Colin, (for centuries the world's youngest maths professor) made Isaac's arithmetic lessons even better for kids!

In the mid to late 1980s when I ran a maths tuition business I spoke about right brain and left brain and learning styles, such as visual auditory and tactile and so on. Teachers thought I was from planet Mars, yet Penguin did publish two books I wrote on the brain learning and memory. Nowadays such ideas are almost mainstream.

So if any teachers or parents would like to have fun with their kids in 2014, I should have more time available from late November.

Thank you again for your interest Christine. I will also approach the AITSL early 2014.

Best wishes,   
Jonathan Crabtree   
P.S. My maths may make adults cry... Kids just have fun!

<http://jonathancrabtree.com/unedited-reactions-from-children-and-adults-1-per-country.txt>

PLEASE NOTE: I do not sell my ideas for money. Paying attention is payment enough and the smiles on childrens' faces, as they have fun with mathematics, are of course, priceless.

1 day ago [report](http://theconversation.com/comments/244528/abuses/new)

* 1. http://theconversation.com/assets/author/thumb36_default-73729457589872500371d456f0994659.jpg

[**Christine Nicholls**](http://theconversation.com/profiles/christine-nicholls-34254)

Senior Lecturer at [Flinders University](http://theconversation.com/institutions/flinders-university)

In reply to [Jonathan Crabtree](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032#comment_244528)

Thank you for this Jonathan. One of the challenges for you I think will be to demonstrate how this approach can be integrated into the maths curriculum as whole, and how their inclusion will further its overarching aims, so I agree that your being in personal touch with AITSL and perhaps giving them copies of your books might be useful too.

And I still think that the most important thing for you will be to be in touch with Indigenous teachers/educators to test the waters with them. If you can…

[Read more](http://theconversation.com/its-time-we-draft-aussie-rules-to-tackle-indigenous-mathematics-15032)

Thank you for this Jonathan. One of the challenges for you I think will be to demonstrate how this approach can be integrated into the maths curriculum as whole, and how their inclusion will further its overarching aims, so I agree that your being in personal touch with AITSL and perhaps giving them copies of your books might be useful too.

And I still think that the most important thing for you will be to be in touch with Indigenous teachers/educators to test the waters with them. If you can make close contact with someone with an interest in maths you'll obtain more detailed feedback.

Both of those things are terribly important, because curricula must necessarily relate the broader program of study within the specific area (in this case maths) & are never written/trialled in isolation.

Questions like, 'Where do these games fit into the broader program of study?'; 'how do they work at a developmental level?'; and 'at what stage/s of children's learning should they be introduced?' all need to be thought through carefully, and explicitly addressed, and without connecting to a larger group of Indigenous educators, practitioners, and curriculum writers I think that it will be more tricky for you...so I think that's the way to go.

All the best with it, Christine

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