

The Duality of Metric Concepts of Contemporary Indigenous Australian Lifeways Kinship Categories and Numbers

Verran, Helen

Published in:
Indigenous Engineering for an Enduring Culture

Published: 01/01/2022

[Link to publication](#)

Citation for published version (APA):

Verran, H. (2022). The Duality of Metric Concepts of Contemporary Indigenous Australian Lifeways: Kinship Categories and Numbers. In C. Kutay, E. Leigh, J. Kaya Pripic, & L. Ormond-Parker (Eds.), *Indigenous Engineering for an Enduring Culture* (pp. 388-403). Cambridge Scholars Publishing.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Indigenous Engineering for an Enduring Culture

Edited by Cat Kutay, Elysabeth Leigh, Juliana Kaya Prpic
and Lyndon Ormond-Parker

This book first published 2022

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

Abstract

The chapter makes an analogy between two quite different metrics that equally 'have life' in the organisations and institutions of both Indigenous and mainstream Australian lifeways. I juxtapose Indigenous systems of kin names, with modernity's numbers. Of course, I recognise that the systems of kinship names that have life in Indigenous Australia are profoundly different than numbers. Yet here is a convincing argument that in several important senses they are alike: different but partially same. The chapter explores the reasons for recognising both the difference and the similarity

CHAPTER TWENTY

THE DUALITY OF METRIC CONCEPTS OF CONTEMPORARY INDIGENOUS AUSTRALIAN LIFEWAYS: KINSHIP CATEGORIES AND NUMBERS

HELEN VERRAN

Introduction

The metric system of measuring - metres and kilometres; litres as cubic decimetres; grams and tons. We learn and teach the series of names with their precise relations in primary school classrooms. And think of the set of names and the defined processes as all there is to metrics. Reading this chapter you will learn that there is much more to metrics than that.

Metrics are systems of standardising and means for regulation in social situations. Metrics perform ordering functions in everyday life, speeding up communication and enhancing mutual trust in transactions. Metrics are part and parcel of knowing as an individual, and of knowing collectively in groups and organisations. This is so in both Indigenous and in mainstream lifeways.

This chapter will make an analogy between two quite different metrics that equally 'have life' in the organisations and institutions of both Indigenous and mainstream lifeways. As you will guess from my title I juxtapose Indigenous systems of kin names and numbers. Of course, I recognise that the systems of kinship names that have life in Indigenous Australia are profoundly different than numbers. But I hope I can convince you that in several important senses they are alike: different but partially same. When it comes to engineering and how it endures that sameness matters.

In the first section of this essay I introduce the general idea of metrics as systems of related concepts. The second part of the chapter lays out my

argument that, as metrics, the number system and the systems of kinship categories that are common amongst Indigenous Australians, are in some ways the same, despite being very different. Then I tell a story that shows an Indigenous grandmother very capably doing the two metrics together simultaneously. In reading the story, the moves that the Indigenous Australian grandmother makes in handling what could have been a very unpleasant occurrence, should be contrasted to what the rather aggressive transit officer does. I include the story to show readers *how* the metrics systems are often *done* together in real life. The final section of the chapter concludes the essay and leaves readers with a question to ponder.

Introducing Metrics as a General Category

In a very general sense metrics offer means for governance, organising through norms that can be specified precisely in myriad ways. Such specifications guide collective habits of ‘doing’ as we go on together enacting our differences - individual, cultural, and political, sometimes in Indigenous life situations and sometimes in mainstream life situations. Metrics as I use it here then clearly goes beyond the meanings we learn to associate with the term in primary schooling. But so too does the understanding of engineering that I am asking readers to consider. The term engineer arises from the medieval Latin *ingeniare* ‘to contrive or devise’, it is associated with the Latin term *ingenium* ‘ingenious’ - and that of course might involve contriving something materially, or it can involve social ingenuity. However, think about it for a moment and you realise that in engineering we are inevitably working materialities and socialities simultaneously; the point is to ensure they come together as one. Engineering is doing sociomateriality. As it turns out thinking of ourselves as contriving particular forms of sociomaterialising in context is a way of being careful and engineering responsibly.

The term ‘metric’ probably makes readers think of using numbers in valuing. And indeed, numbers as metrics are used universally in measuring and enumerating. But at core, valuing is just one way of ordering. Ordering can also be achieved by any standardised way of relating - numbers are only one such means. In contemporary Indigenous Australian life, we do find metrics that work through valuing - numbers, and this has been the case ever since numbers as cultural objects, were introduced into Indigenous lifeways somewhere between a century and two centuries ago. But there are also metrics that work through standardised relating - kinship systems. These are the dual metrics of contemporary Indigenous Australian lifeways.

We do not usually think of kin categories as a metric, but recognising them as that can help outsiders credit their profound cultural significance in Indigenous Australia, and more easily accept the reality that far more than human kinship is involved. Of course, kinship systems also work in mainstream lifeways, but there, kinship systems are far less standardised and only involve humans and their close family members. In modern life although some kin relations enact governance in some situations, they are not a generalised technology of governance, which they are in most Indigenous organisations and institutions. The differences I am seeking to draw attention to here is the sheer strength and the widespread significance of kinship as a standardised metric of knowledge and governance in Indigenous life. Engineers working in Indigenous Australia need to recognise and have some sense of its influence not only culturally but also in knowledge and governance work.

The term 'metric' comes to us from the word *metron* which was used in Ancient Greece, where it concerned the crafts of the poets and of the geometers. In poetry it was patterns in timing of performance, while in geometry it was patterns in spatiality that mattered. A metric system in action can be imagined as a mesh which, through *particular sorts of entities* (for example, real numbers and/or a group of people or places that share a particular kin position) and *a set of defined relations* on how these entities are connected and separated (for example the rules of addition and multiplication, and/or the rules on mutual responsibilities between kin positions). The combination of rules and defined entities organises formal patterns embedded and expressed in and as society, culture, and politics in particular material ways. Metrics support actualising - the happening or coming to be, of a here and now. Metrics work to make patterned connections and separations in particular times and places where inevitably, relations are mediated through involvement with the stuff of the physical world.

In this short essay I begin by elaborating the specifics of dual metrics in communities of contemporary Yolngu Aboriginal life. While both systems of metrics are quite explicitly done in contemporary Yolngu life, in other Australian Indigenous communities, the duality might not be so explicit, but it is still potent. Having elaborated the principles of the duality of metrics discursively, I go on to tell a story of playing a marginal role in institutional failure to acknowledge and respect the metric duality by which many Indigenous Australians live their lives. The point of this story is to show the on-the-ground practices of doing metrics and their core categories which significantly, are *simultaneously* both social and material; they sociomaterialise

in practices, we might say. It is a truism to say that there is nothing social that is cannot be materialised in particular times and places, and there is nothing that is materialised as meaningful in a particular time and place that is not also social. Recognising this when we use metrics is important. In this essay in focussing on such practices in telling an ethnographic story, I am showing a “complex yet everyday situation as in flux... [one in which simultaneously] everything is social and everything is material to some degree.” (van Dijk & Rietveld, 2017). But first I offer some general comments on numbers and kinship categories as dual metrics.

Metrics and Organising Collective Life in Contemporary Indigenous Australia

Governance and metrics are in a sense made for one another. Beginning on a biographical note. I identify as from a settler family; my mother was the first Australian in our family, and my older brother the second. In 1987, before I could properly begin my work as mathematics education lecturer teaching Yolngu Aboriginal Australian students living in the homelands in northeast Arnhem Land, I was adopted into the Marika clan - as the sister of the wife of one on my students. The adopting family members recognised that it would mean a lot to me personally, and they were right (they had done this with Balanda before). *But*, they explained kindly and at length, from their point of view *that* was not the issue.

I was told that the matter had been discussed by the elders and the Marika family had been settled on as the adopting family, because it was considered that this family was best placed to govern and direct my involvement with the Yolngu schools and the wider community. It was not actually about me as a person, but rather about caring for the on-going well-being of what we might call the Yolngu politico-epistemic collective; in Yolngu terms, the community's *Gakal*. It was about governance in a community where epistemics - knowledge doing and making, and politics are *never* separated out from each other. Being so adopted, in coming into my allocated place in the *gurrutu* system, in theory every Yolngu person - from the youngest to the oldest, and every Yolngu place, could ‘call-me-out’. My being named as part of *gurrutu*, was about making mutual accountability explicit; it concerned governance of the community and of the research in mathematics education I was involved in. In participating in mathematics curriculum development in Yolngu schools between 1987 and 1996, I was a member of a group of scholars and pedagogues who developed a radically alternative mathematics curriculum named Garma Maths, or sometimes Living Maths.

That the kinship systems of Indigenous Australians are mathematically precise has been well recognised amongst scholars for several centuries by now.¹ However applying that insight in developing a mathematics curriculum proved controversial in the 1990s, and is still so.²

Relations between modern governance and metrics in the form of numbers is probably thoroughly familiar to readers. In modern life, politics (governance) and epistemics (knowledge doing and making) are treated discursively as separate and distinct. Numbers as a form of knowledge of the material world feature very strongly in modern governance as we all know, and also in modern politics, number lies at the core of the complex relation between individual citizens and parliament as the ‘whole of the citizenry’. In modern life there is an ontological distinction between representation of the natural world with numbers, and representation in the social world which also uses number, albeit rather differently. This separation on the one hand and connection on the other between the natural and the social, is a profoundly important contrast in the modern side of Indigenous life ways, and their in-place aspects. This profound cultural difference between how the connections and separations between knowledge and politics are done, shows up when we consider the roles of the disparate metrics of contemporary Indigenous life.

In modern life metrics are treated as a technology. As such they are seen, like all technologies as somehow neutral, merely a means of regulating and controlling. But the core metric of Indigenous life way - kinship categories

¹ Australian Kinship studies as a form of applied mathematics continues as an active site of social science research in Australia. See Kelly, P. and McConvell, P. (2018). “Evolving Perspectives on Aboriginal Social Organisation: From Mutual Misrecognition to the Kinship Renaissance” in *Skin, Kin and Clan: The dynamics of social categories in Indigenous Australia*, edited by Patrick McConvell, Piers Kelly and Sébastien Lacrampe, published 2018 by ANU Press, The Australian National University, Canberra, Australia. In 2016 the austkin website detailing the mathematical workings and structures of over 600 kinship system was launched <http://www.austkin.net/>

² The Garma Maths curriculum was controversial in the early 1990s. Recently this successful curriculum program was re-featured by the Australian Broadcasting Commission as part of their Quantum science programme, which replayed a 1991 Quantum documentary film on Garma Maths. www.abc.net.au/news/science/2017-02-01/trail-blazing-aboriginal-bilingual-maths-program-revisited/8134998. This proved just as controversial 25 years later. See www.theaustralian.com.au/commentary/opinion/teaching-children-aboriginal-kinship-in-maths-does-not-add-up/news-story/bf5904d6ac6db0003425497d645968f8

are certainly not technology and are not the means to an end - keeping the metric balanced and working *is* the ends sought. I come back to this in concluding this essay, for this crucial difference in what we might call *technê* (to invoke the Ancient Greek word that distinguishes mere practice from proper knowledge) in modern and traditional aspects of Indigenous lifeways, matters when we consider 'enduring engineering'. When we ask about metrics and their differences, because it is our basic categories and concepts that metrics bring order to, we find in turn that we need to think carefully about our categories and concepts. And when we start talking about categories and concepts we find ourselves in the domain of cosmology.

Cosmologically modern worlds differ from the Indigenous worlds. The modern world has a Natural cosmos where the social sits within and derives from the Natural, and things of the Natural are taken as material objects which are variously socialised. The Natural is said to have had a natural beginning—just once long, long ago, in the Big Bang. In contrast the Yolngu Indigenous world which is the exemplar Indigenous world I am using here, is exhaustively divided into two parts, and it is the ideal of Yolngu life to keep the two in balance. The two parts of the world were and continue to be (re)made by Spirit Ancestors which were and are either Yirritja and Dhuwa. It follows that half of the Yolngu Indigenous people are Yirritja and the other half Dhuwa. Adopting 'moiety' an old French word that anthropologists introduced them to (from *moite* 'meaning sectioned in the middle'), today Yolngu Indigenous people explain their world is made as two moieties—Yirritja and Dhuwa. And of course, in each moiety half of the people are women and the other half men. But it is not only women and men who are either Yirritja or Dhuwa, very close to everything—places, animals, concepts, ceremonies, words, songs, plants, ghostly spirits, clans is one or the other. These cosmological commitments matter when it comes to metrics.

Not unexpectedly, the metrics that express and bring order to the very different cosmoses that contemporary Indigenous life operates across, between, and with, feel and *are* very different. The metric system most highly valued in contemporary life of Yolngu Indigenous Australians who own lands in north east Arnhem Land, *gurrutu*, is used most comfortably in Yolngu matha (language), but often is also in English language. In English it is often called 'the kinship system'. *Gurrutu* is a system of metrics that works through units of relation and is primarily a means for finding and making balance.

Here I plot out the *gurrutu* series of relations by using human relations mediated through two important male-female relations—brother sister within moieties, and husband-wife relations between moieties. Although ordering those relations of familiar human connections and separations are only just one aspect of *gurrutu*, the relational aspects can be clearly articulated by this means.

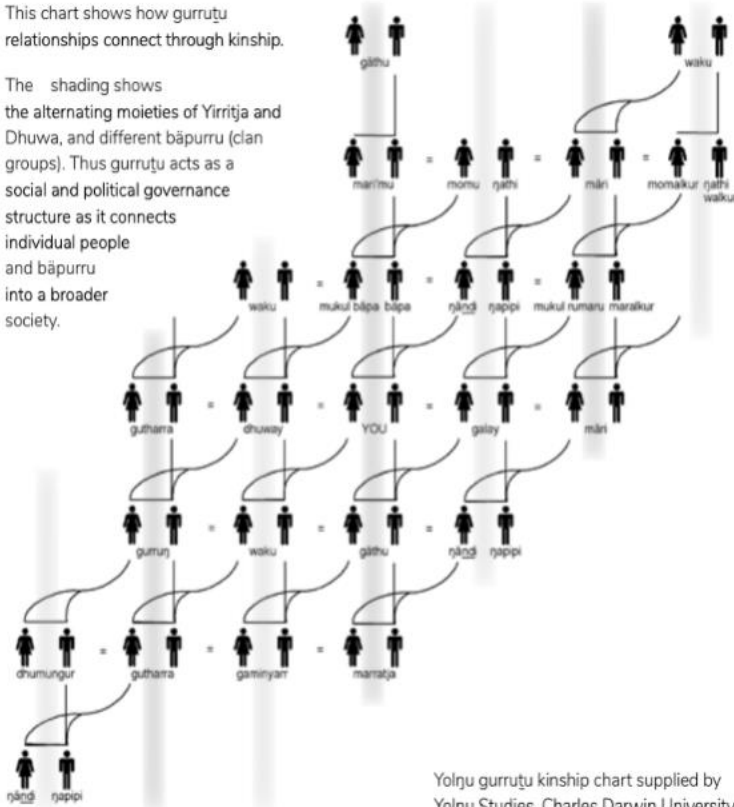
Let us start with a Yirritja position (I will make my starting position female), her brother position is of course also Yirritja (brother and sister is the basic pair or 2). Of course, her husband must be a Dhuwa man (who of course, has a Dhuwa sister)—these are the Dhuwa pair. Take these two sets of two as the parent generation, the basic set of *gurrutu* names then specify the relations of the off-spring of my exemplar Yirritja woman and Dhuwa man, across three generations. This pattern of named relations is recursively repeated then every three generations. In mathematical terms the system can be described as a group system; two mutually entwined sets (one Yirritja, and one Dhuwa) or 2^3 . Some readers might find a graphically plotted out version of this necessarily complicated description of the system, useful (Figure 1).

Gurrutu is a recursive system of naming relations which both connects and regularises Yolngu life. Social order is achieved and life is made predictable and on-going through this formal recursive system of names. This is not a static balance, it is a thoroughly dynamic balance where, in governance of relations, both initiating and blocking moves are expected of both sides. The world is in perfect balance if the relational triangles formed by the kinship relations between a grandchild and each of her father's and her mother's parents, each mathematically mimics the relations of a golden triangle; albeit that in practice such perfect balance is rarely achieved. However, what can be and is achieved in practice is strict avoidance of any social contact and hence familiarity, between persons where sexual relations would in the long term seriously *unbalance*. Such an unbalanced situation would see one of the moieties, either Yirritja or Dhuwa, begin to overwhelm the other in terms of numbers of persons or over areas of land. In Aboriginal English these are the personal relations known as the 'poison-cousin' relation. One way in practice this important rule is enacted in Yolngu *gurrutu* and other Australian Indigenous kinship systems is that individuals always take great care to keep well clear of any and all possible in-laws!

Gurrutu kinship chart

This chart shows how gurrutu relationships connect through kinship.

The shading shows the alternating moieties of Yirritja and Dhuwa, and different bapuru (clan groups). Thus gurrutu acts as a social and political governance structure as it connects individual people and bapuru into a broader society.



Yolngu gurrutu kinship chart supplied by Yolngu Studies, Charles Darwin University.

Fig 20-1. A graphic version of *gurrutu* relations plotted as women and men occupying positions in the entwined sets of 2³. Yolngu and Balanda have worked together over many years to develop diagrams of kinship – or *gurrutu*. This particular version dates back to the 1990s when the Yolngu Studies program was set up a NTU (now CDU).

In contemporary Indigenous Australian lifeways there is also another metric that is routinely utilised, usually using English, the numbering system. Base-ten modern numbers have been significant in contemporary Indigenous Australian lifeways for several centuries now and there is

evidence that numbers as a recursive metric in Aboriginal Australia have even been changed by their interaction with the recursive metric of kinship.³

The number metric works with units of value where things of the modern world are rendered as valuable on the basis of the qualities or attributes that they have. To use the examples of my very first sentence “The metric system of measuring - metres and kilometres; litres as cubic decimetres; grams and tons”: the attributes of qualities here are length, volume, and mass respectively. The sorts of qualities or attributes that valuation can proceed through is infinite, and new ones are always being invented.

In modern institutions and organisations numbers usually work primarily as a means of negotiating agreements and transactions, and one reason numbers are so useful in this way is because they are a system of structured relations. And it is in *this* aspect that numbers are analogous to Indigenous Australian kinship categories as a system of metrics. The formal metric recursions originating in Indigenous Australian (kinship) and Western life (numbers) are strictly analogous, in the sense of logic or mathematics. Each metric is formally iterative; it has rules about how to use a particular set of relations. That is, both number systems and kinship systems involve reoccurrence - they are recursions. Each system has i) A basic set of core names; ii) A set of rules for devising further names from any one name; iii) A set of rules for use of the system with the material world.

The two recursions, kinship and number, can be regarded as meshes of different forms that lace through contemporary Indigenous lifeways, partially holding things together and importantly keeping other things distinct and separate. In the kinship system all the basic names exist in reciprocal pairs - that is what happens in a cosmos where balance is highly valued morally speaking. The *gurrutu* system is a recursion of connections between two points, while the number system is a recursion of points as singulars.

One naturalistic story of how these systems connect that we might tell connect them through the human body. Although, in proposing this respectfully I acknowledge that being committed to metaphysical origins, it is likely that neither those for whom *gurrutu* matters, nor those who love numbers, would ever tell such a story. Nevertheless in a naturalistic way we

³ The recognition that the ways that numbers work as cultural objects that encode and precisely standardise value and spatial and temporal order, can be influenced and altered when they work alongside *gurrutu*, was revealed in a long term ethnographic study (Christian Clark, 2011).

could say that as recursions both *gurrutu* and number as patterned series of names, might be thought to have as their origin in other very practical patterns implicit in everyday human life. *Gurrutu* as a formal system mimics the logical patterns of human reproductive relations; numbers as a formal pattern mimics the relations of fingers and hands, reflecting early tallying techniques.

From these alternative naturalistic patterns come rules for logically deriving named relations. The rules are what enables the patterns to be infinitely extended. In both recursive systems the set of rules for deriving names could be said to be abstractions of other the human bodily patterns; they have a material basis. There is another set of rules involved in use of both the systems too. These are rules for use of the names in conjunction with practices for ordering the material world. Here we again see differences between the *gurrutu* and number. The rules for using *gurrutu* in materialising order for example in land ownership arise in accounts of the journeys of Spirit Ancestor Beings. Numbers in contrast order the material world through the no less mysterious qualities or properties that are said to be somehow inside or held by physical material.

Gurrutu and numbers feel very different in use; they evoke quite different affects, the former associated with the intimacy of 'doing family', the latter being frankly transactional. In a logical sense however *gurrutu* and numbers are strictly analogous. Analogy, like metric, is a term that comes down to us in modern times from Ancient Greece. *Analogia* named an analytic move beloved of mathematicians in Ancient Greece. Those men valued the precise beauty of quantitative ratio. Analogy implies a doubled relation, a relation between two relations through a common third element (an example is the analogy between the relation 1:2 and the relation 6:12). What is special about the analogy between *gurrutu* and numbers is that each system is itself already a complicated set of analogies - both are relations of relations; relationality goes all the way down on both sides so to say. Analogies between patterned biological relations, patterns rendered in sets of words, and patterns rendered in stories of qualities held by the materiality.

In the next section of the chapter, I tell an ethnographic story of an experience I had during a journey on a suburban Darwin bus. As I experienced the happenings I relate here, among many, many other things I felt them as expressing a deeply embodied sense of the dual metrics; a sense through which the heroine of my story clearly lives her life. The story has the form all stories have - it has a beginning, a middle and an end. However,

that narrative is merely the background of what I want to foreground in telling this story. I am asking readers to pay attention to the sociomaterial practices by which the two protagonists interact. Only by learning to foreground such practices in their enactments in our observing of such episodes, will we be able to glimpse the dual metrics ‘at work’ so to say.

Meeting the Dual Metrics of Contemporary Indigenous Australian Life on a Darwin Bus

In the small Australian city of Darwin, the buses are an inexpensive way to travel. In my experience they are rarely less than half full, but on the other hand they are almost never crowded. They are comfortable without being luxurious, air-conditioned so that it is usually quite pleasant to step into a bus, the journey a brief respite from the tropical heat. The city is small and its suburbs are few. The buses move in and out of the tiny city centre and circumnavigate both clockwise and counter clockwise. Many passengers who use the buses travel in groups, and they often hop on and off buses several times a day, circulating through Darwin’s public places. The buses generally buzz with cheerful conversations and have a comfortable, homey feel. Few express buses run, and most buses halt at every stop along a route.

One week I travelled twice a day on the buses, moving along two routes during each journey to and from my office at the university. I find the life on buses interesting, and during this week several incidents occurred that I found disconcerting in the sense that they puzzled me, I could not quite discern their significance in the vague scheme of things that is Darwin life. I felt a need to keep them with me so that I might turn them over, look for places to “get inside” them, so to say. It seemed they were moments when some sort of undertow in the flow of banalities broke briefly through the surface. In this small but unusual Australian city, the very ordinary experience of traveling on a suburban bus can be interrupted unexpectedly, as lives lived within Western and Indigenous cosmologies abut and abrade openly, tensions sometimes flash and catch you by surprise.

It was a weekday, the start of the work and school day, and I was traveling away from the city centre. At a stop some ten minutes into the journey, outside a Catholic secondary school, several children got off and quite a large group of neatly dressed Aboriginal women and children got on. The family joining the bus was greeted in a voice that carried halfway down the bus. I am familiar enough with Indigenous Australian life to recognise that the greeting was actually a form of alert of the presence of so-called ‘poison-cousins’, kin who should be avoided, not because of ill-will but because the

people involved are specifically situated in avoidance relations in the strong traditional Indigenous kin systems through which governance is still pursued through in many NT towns and settlements.

A senior woman in the party joining the bus, paid the bus fares for the other, mostly younger women. All the while she addressed the brood of children loudly in an Indigenous language. It was intimate in tone, albeit shouted and admonitory. I recognized certain kinship relations terms in her address and guessed the woman stood in the relation of mother's mother to at least some of the children. The children (who travel free on buses) bundled aboard, rushing to get their favourite places, their boisterous tumbling about calling forth more urgent and even louder shouted address from the matriarch. For a few moments during that bus ride the collective life, as lived and experienced in an Indigenous cosmology, ruled.

As it happened, this was the only day that my bus ride featured the presence of transit officers, and one of the officers took exception to this behaviour. According to a government-maintained website, a transit officer can do any of the following (Northern Territory Government of Australia, 2020):

- Direct a person engaged in unacceptable and antisocial behaviour to leave a bus, interchange or bus stops
- Remove a person from a bus, bus stop or interchange
- Ask for a person's name, address, or date of birth if the officer reasonably believes the person may have committed an offense or they can assist in the investigation of an offense
- Direct a person to comply with the rules of behaviour on a bus
- Require a person to get off a bus, keep away from a bus station, and use reasonable force if necessary
- Issue on-the-spot fines
- Arrest and detain a person (without warrant) where the officer believes on reasonable grounds the person has committed an offence warranting arrest
- Search and seize dangerous articles from an arrested person

Upon boarding the bus several stops earlier the transit officers had positioned themselves deliberately. One officer stood near the back door, and a second, a younger and fitter man, stationed himself in the narrow passage that all passengers (bar those who occupy the very front row) must move through to take a seat. The narrowness of this passage meant that those boarding must squeeze themselves past the officer. His position made it easy for him to block passage. The discomfort of passengers joining the bus in

these circumstances was obvious, the exception being some children who bent low, put their heads down, and charged. It was this behaviour that had provoked loud shouts from the woman paying the fares for her adult family members.

She was still fumbling with her coins, the line of tickets she had purchased fluttering from her hand, as she turned from the driver to pass into the bus. The transit officer shifted his position to confront her, uncomfortably close, preventing her passage. She concentrated on getting the coins into her purse. Very loudly, exceeding the volume of the woman's shout at her brood but with a quite different tone and speaking English, the transit officer barked, "When you board a bus you must behave like a bus passenger!" The bus fell silent; the driver seemed to still the engine. The woman looked at the officer squarely, unmoving and calm. "Yes, sir," she said loudly into the silence. Several passengers sitting nearby burst out laughing at her deadpan performance with its perfect comic timing. "Passengers do not shout!" he shouted, somewhat lamely, as he stepped aside, with as much ceremony and dignity as he could muster, to let her pass. He was still glowering minutes later.

I was one of the passengers who chuckled out loud, yet in addition to the amusement expressed in this involuntary act, I felt both offended and puzzled by the episode. It was a tense moment, punctured by comedy and unexpected collective laughter. Was the transit officer behaving in a racist manner? Yes, that and more. He had silently harassed all boarding passengers, succeeding in making his intimidating presence felt all through the bus. That some smaller children clearly had a well-established routine for evading his methods suggested this was not a new experience. And it was clear that the matriarch was no less experienced in dealing with racist transit officers than with boisterous grandchildren. Along with everyone else on the bus I knew that public transport governance had happened; that we all noticed it actually attests to it being a failure of mundane governance. Of course, the pain of the experience of racism embedded in this happening of governance affected each of the bus passengers, although differing markedly in degree; others who participated in this little event would likely tell its story quite differently.

Concluding

In this short essay I first introduced the general idea of metrics as systems of related concepts. Then I used formal mathematical language to describe a system of kinship categories, to propose it as strictly analogous to the

modern number system. I recognise that most readers, Indigenous and non-Indigenous alike would not consider kinship a matter of mathematics and nor is it most of the time. But recognising that kinship has a mathematical aspect, and because of that it serves as a perfectly adequate means of organising and ordering society, including teaching children about metrics and how they work, is crucial in recognising and respecting it as sociomaterially potent metric.

The kinship naming systems of contemporary Indigenous Australian lifeways offer means for innovating while maintaining accountabilities in ways that are consistent with Indigenous governance traditions. For example, through such a metric, novel landscape firing regimes can be derived, novel gender relations managed, and individual and group skill accreditation contrived in meeting Indigenous workforce development needs.

In the story we saw that the category of bus-passenger is not only a matter of numbers - albeit that in the form of metric it is important for the bus company in the sense of paying the fare and so on. But metrics of bus-passengers in places like Darwin are also a matter of keeping lines of Indigenous kinship authority straight. The peculiarities of buses as social spaces, means that there is a need to explicitly recognise rules and behaviours by which dual metrics can be done simultaneously and in good faith.

At first sight it is not obvious that in public life in some places and times, dual metrics are involved in the practices in and as which, everyday situations happen. In my story of the Darwin bus passenger readers need to work hard in attending to the happenings related in the story if they are to see it. However, that dual metrics are involved in contemporary Indigenous landownership is more obvious. This 'other' metric which contrives lawful landownership through kinship categories has now been recognised by Australian state authorities. In the 1990s when legal acknowledgement of the fact that Indigenous Australian peoples own their lands and always have, was achieved albeit after two centuries of wilful blindness.

In concluding, I come back to briefly discuss my beginning claim that metrics in action can be imagined as meshes which help make patterned connections and separations. They are systems that we contrive through and with. Does this mean that metrics can be thought of as technologies? In attempting to answer this question in the context of the dual metrics of Indigenous Australian life we come up against a profound difference

between modern institutions and Indigenous institutions and hence in the different metrics by which each is rather differently laced or meshed together.

While I have connected two very different metrics analogically here, I also recognise profound difference. And this profound difference rears its head when we come to the issue of technology which is important for engineers. A technology is imagined as techniques and processes that connect, weave together the social and the material worlds. And numbers can be understood as technique in just that sense. But kinship categories can never be understood in that way. People and other kin can never be mere means. So, this is my take home message. It comes in the form of a question. What could ‘technology’ be in Indigenous life where sociality and materiality are one category to begin with? This seems to be a question that those who would enduringly engineer in the context of Australian Indigenous life should learn to think deeply about.

Bio

Helen Verran trained (a long time ago) as a natural scientist. Unable to find work as a research scientist after her child-rearing years, she retrained as a primary school teacher. After a few years in classrooms she started training primary school teachers to teach maths and science, and spent years working with experienced Yoruba teachers in Nigerian classrooms. She wrote a prize-winning book *Science and an African Logic*, about what she learned in those years in Nigeria. Returning to Australia her research involved working with Yolngu Aboriginal Australians as they negotiated with modern institutions like the NT Education Department and NT Parks and Wildlife. She currently works in CDU’s Northern Institute.

References

- Kelly, P. and McConvell, P. (2018). “Evolving Perspectives on Aboriginal Social Organisation: From Mutual Misrecognition to the Kinship Renaissance” in *Skin, Kin and Clan: The dynamics of social categories in Indigenous Australia*, edited by Patrick McConvell, Piers Kelly and Sébastien Lacrampe, published 2018 by ANU Press, The Australian National University, Canberra, Australia.
- van Dijk L. and Rietveld E. (2017) Foregrounding Sociomaterial Practice in Our Understanding of Affordances: The Skilled Intentionality Framework. *Front. Psychol.* 7,1969. doi: 10.3389/fpsyg.2016.01969

- Spencer, M., Nyomba Gandaḡu, and Michael Christie, (submitted, 2022). Monitoring and Evaluating Community Development in Aboriginal Australia: Cleaning up some of the ‘mess’ in social science. *Australian Aboriginal Studies*
- Watson-Verran, H. (1992). *We’ve heard that you teach maths through kinship. A Garma Maths Course of Study in the Yirrkala and Laynhapuy Schools Community*, NT Government Department of Employment, Education & Training, Yirrkala Community Education Centre, laal.cdu.edu.au/record/cdu:39997/info/
- Christian Clark (2011) *Numbers in ArnhemLand: value and difference in a postcolonial mathematics*. PhD Thesis University of Melbourne, <https://minerva-access.unimelb.edu.au/handle/11343/36305>
- Northern Territory Government of Australia (2020), *Transit Officers*, last updated June 16, 2020, originally accessed October 8, 2018 <https://nt.gov.au/driving/public-transport-cycling/bus-information,-safety-and-alerts/transit-officers/> .