8. Narrating a Number and Staying With the Trouble of Value

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Abstract
Numbers are seemingly uncomplicated and straightforward measures of value, but beware—numbers hide moral and political trouble.

Keywords: ecosystems value, Australian environmental governance, sociology of quantification, data journalism, science and technology studies

At the turn of the century the Australian state developed an environmental policy that saw it fully subsidizing labour costs incurred by landowners if they undertook specifically agreed upon landscape work that was designed to reverse environmental degradation. However, given the almost total domination by neoliberal ideologues in this policy area at that time, the policy was described in the dizzying double-talk of value of ecosystems services. In policy documents it was described as “purchasing environmental interventions to enhance the state's environmental value.” Thus in 2009 a state government department would make this almost incomprehensible claim about the success of this policy: In 2009 the contribution to Australia's GDP from transactions in which the state purchased environmental interventions to enhance ecosystems value from rural landholders in the Corangamite Natural Resource Management Region (NRMR) was calculated as AUD4.94 million.

The number that I narrate here emerged in a press statement issued by the government of the Australian state of Victoria in 2009. The media release announced the success of investment by the state government in environmental conservation in one of Australia’s 57 NRMRs. The environmental administrative region of grassy basalt plains that spreads
east–west in south-central Victoria is named Corangamite, an Aboriginal
term that replaced a name bestowed by the first British pastoralists who
in the mid-19th century invaded this country from Tasmania. They called
the region “Australia Felix” and set about cutting down all the trees. The
squatters, who subsequently became landowners here, would in less than
a century become a sort of colonial landed gentry. In 2008, in operating the
EcoTender Programme in the Corangamite NRMR, the Victorian government
purchased ecosystems services value from the descendants of those squatters
in pay-as-bid auctions. In 2009 the contribution to Australia’s GDP from these
transactions was calculated as AUD4.94 million. The announcement of this
value was the occasion of the media release where I first met the number.

I doubt that any journalists picked up on the news promulgated in this
brief, including its numbered value; this number is hardly hot news. In the
context of a press release the naming of a specific number value reassures.
The national accounts are important and real, and if this regional govern-
ment intervention features as a specified value contributing to the national
economy, then clearly the government intervention is a good thing. The
specification of value here claims a realness for the improvements that the
government interventions are having. The implication is that this policy leads
to good environmental governance. Of course, the actual value the number
name (AUD4.94 million) points to, what it implicitly claims to index, is not of
much interest to anyone. That a number appears to correspond to something
“out there” that can be valued, is good enough for purposes of reassuring.

My narration of this number offers a mind-numbingly detailed account
of the sociotechnical means by which the number came to life. The story
has the disturbing effect of revealing that this banal number in its workaday
media release is a paper-thin cover-up. Profound troubles lurk. Before I
begin to tell my story and articulate the nature of these profound troubles
that seem to shadow any doing of valuation, even such a banal doing, let me
pre-emptively respond to some questions that I imagine might be beginning
to emerge for readers of The Data Journalism Handbook.

First, I acknowledge that telling a story of how a number has come to
life rather than finding some means to promote visualization of what that
number means in a particular context, is rather an unusual approach in
contemporary data journalism. I can imagine a data journalist doubting that
such storytelling would work. Perhaps a first response is to remind you that
it is not an either/or choice and that working by intertwining narrative and
visualizing resources in decoding and interpreting is an effective way to get
ideas across. In presenting such an intertwining, journalists should always
remember that there are two basic speaking positions in mixing narratives and
visuals. One might proceed as if the visual is embedded within the narrative, in which case you are speaking to the visual, which seems to represent or illustrate something in the story. Or, you can proceed as if the narrative is embedded in the visual, in which case you are speaking from within, diagram. This is a less common strategy in data journalism, yet I can imagine that the story I tell here could well be used in that way. Of course, switching between these speaking positions within a single piece is perhaps the most effective strategy (for an account of such switching, see Verran & Winthereik, 2016).

Second, you might see it as odd to tell a story of a very particular number when what clearly has agency when it comes to decision–making and policy design, and what data journalists are interested in, is what can be made of data sets in mobilizing this algorithm or that. This worry might prompt you to ask about relations between numbers and data sets. The answer to such a query is fairly straightforward and not very interesting. There are many numbers in a data set; the relation is a one–many relation albeit that numbers are assembled in very precise arrays. The more interesting question enquires about the relation between numbers and algorithms. My answer would be that while algorithms mobilize a protocol that elaborates how to work relations embedded in a database, numbers express a protocol that lays out how to work relations of collective being. Numbering is a form of algorithmning and vice versa.\(^1\) We could say that numbers are to algorithms as a seed is to the plant that might germinate from it; to mix metaphors, they have a chicken-and-egg relation. While there are certain interestingly different sociotechnical characteristics of generating enumerated value by analogue means (mixing cognitive, linguistic and graphic resources), of conventional enumeration as taught to primary school children, and of contriving enumerated value by digital computation, it is the sameness that matters here: AUD\(4.94\) million has been generated algorithmically and expresses a particular set of relations embedded in a particular data set, but it still presents as just a number.\(^2\)

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\(^1\) The idea that numbers and algorithms have a sameness is possibly new for many readers, so used are they to thinking of numbers as “abstractions.” My (unusual) account of numbers has them as very ordinary material semiotic entities that inhabit the here and now. For an account of differing protocols mobilizing relations within a single moment of collective being, see Watson, H. (1990). Investigating the social foundations of mathematics: Natural number in culturally diverse forms of life. Social Studies of Science, 20(2), 283–312. https://doi.org/10.1177/030631290020002004, or Verran, H. (2001). Two consistent logics of numbering. In Science and an African logic (pp. 177–205). University of Chicago Press.

\(^2\) For an account of differing sociotechnical characteristics of three numbers that variously emerge in analogue or digital environments, see Verran, H. (2015). Enumerated entities in public policy and governance. In E. Davis & P. J. Davis (Eds.), Mathematics, substance and surmise: Views
So now, to turn to my story. The intimate account of number making I tell here as a story would enable a journalist to recognize that the good news story that the government is slyly soliciting with its media release is not a straightforward matter. We see that perhaps a political exposé would be more appropriate. The details of how the number is made reveal that this public–private partnership environmental intervention programme involves the state paying very rich landowners to do work that will increase the value of their own property. The question my story might precipitate is, how could a journalist either celebrate or expose this number in good faith? When I finish the story, I will suggest that that is not the right question.

Narrating a Number

What is the series of sociotechnical processes by which ecosystems services value comes into existence in this public-private partnership programme in order that this value might be traded between government as buyer and landowner as vendor? And exactly how does the economic value of the trade come to contribute to the total marginal gains achieved in the totality of Australian economic activity, Australia’s gross domestic product (GDP)? I attend to this double-barrelled question with a step-by-step laying out of what is required for a landholder to create a product—“ecosystems services value”—that can compete in a government-organized auction for a contract to supply the government with ecosystem services value. The messy work in which this product comes to life involves mucking around in the dirt, planting tree seedlings, fixing fences, and generally attempting to repair the damage done to the land perhaps by the landowner’s grandparents, who heedlessly and greedily denuded the country of trees and seeded it with water-hungry plants, in hopes of more grain or more wool and family fortune. Ecosystems services value is generated by intervening in environmental processes.

The value, which is the product to be traded, begins in the work of public servants employed by a Victorian state government department (at that time the Department of Sustainability and Environment, DSE). Collectively these officials decide the areas of the state within which the administration will “run” tenders. In doing this, EnSym, an environmental systems modelling platform, is a crucial tool. This computing capacity is a marvel; it knows

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**on the meaning and ontology of mathematics** (pp. 365–379). Springer International Publishing. https://doi.org/10.1007/978-3-319-21473-3_18
“nature out there” as no scientist has ever known nature. Precise and focused representations can be produced—probably overnight.

This software has been developed by the ecoMarkets team and incorporates science, standards, metrics and information developed within DSE, as well as many leading international and national scientific models. EnSym contains three main tools—the “Site Assessment Tool” for field work, the “Landscape Preference Tool” for asset prioritisation and metric building, and “BioSim” for catchment planning. (DSE, 2018)

Prioritizing and mapping the areas of the state where auctions will be established, specifying and quantifying the environmental benefits, the ecological values, that might be enhanced through on-ground conservation and revegetation works, are recorded in numerical form. They represent ecosystem properties in the “out there” land. And the computer program can do more than that, it can also produce a script for intervention by humans. Just as the script of a play calls for production, so too does this script. And, as that script comes to life, “nature out there” seems to draw closer. It ceases to be an entirely removed “nature out there” and becomes nature as an infrastructure of human lives, an infrastructure that we might poke around in so as to fix the “plumbing.”

When the script for a choreographed production of collective human effort is ready, the government calls for expressions of interest from landholders in the project area as the next step. In response to submitted expressions of interest, a government officer visits all properties. We can imagine this officer as taking the general script generated by EnSym along to an actual place at a given time. He or she has a formidable translation task ahead.

The field officer assesses possible sites for works that might become a stage for the production of the script. The aim is to enhance the generation of the specified ecosystems services, so the officer needs to assess the likelihood that specified actions in a particular place will produce an increase in services provision from the ecosystem, thus increasing the value of that particular ecosystems service generated by that property, and through adding together the many such increases generated in this intervention programme, by the state as a whole. Together the landowner and the government officer hatch a plan. In ongoing negotiation, a formalized management plan for specified plots is devised. The field officer develops this plan in contractable terms. Landholders specify in detail the actual work they will do to carry out the plan. Thus, a product that takes the form of a particular “ecosystems services value” is designed and specified
as a series of specified tasks to be completed in a specified time period: So many seedlings of this set of species, planted in this array, in this particular corner of this particular paddock, and fenced off to effect a conservation plot of such and such dimensions, using these materials.

Landholders calculate the cost of the works specified by the state, no doubt including a generous labour payment. They come up with a price the government must pay if it is to buy this product, a particular “ecosystems services value.” Here they are specifying the amount of money they are willing accept to undertake the specified works and hence deliver the ecosystems services value by the specified date. They submit relevant documents to the government in a sealed envelope.

So how does the subsequent auction work? Here EnSym becomes significant again in assessing the bids. Not only a knower of “nature out there,” and a writer of scripts for intervention in that “out there” imagined as infrastructure, EnSym is also a removed judging observer that can evaluate the bids that have been made to produce that script, much like a Warner Bros. might evaluate competing bids to produce a movie. Bids are ranked according to a calculated “environmental benefits index” and the price proposed by the landowner. We must suppose that the government buys the product which offers the highest “environmental benefits index” per unit cost.

Bid assessment. All bids are assessed objectively on the basis of the estimated change in environmental outcomes; the value of the change in environmental outcomes; the value of the assets affected by these changes (significance); dollar cost (price determined by the landholder).

(DSE, 2018)

When the results of the auction are announced, selected bidders sign a final agreement based on the management plan and submitted schedule of works, as defined spatial and temporal organization. When all documents are signed, reporting arrangements are implemented and payment can begin: “DSE forwards payment to signed-up landholders on receipt of an invoice. Payments occur subject to satisfactory progress against actions as specified in the Management Agreement” (DSE, 2018).

This Is a Good Thing, Right?

What I have laid out is a precise description of how to buy and sell ecosystems services value. This takes me back to the press release. A quick reading of
the media statement might leave a reader with the impression that AUD4.94 million is the value of the additional natural capital value that this government programme has generated. At first glance AUD4.94 million appears to be the marginal gain in Australia’s natural capital value that was achieved in the programme. But that is a mistake. AUD4.94 million is not the name of a natural capital value. I explain what this number name references below. At this point I want to stay with the product that has been bought and sold in this auction. This product is the trouble I want to stay with.

I want to ask about the value of the increase in “ecosystems services value” that this elaborate and rather costly government programme has achieved. A careful reading of the details of the work by which this increase in value comes into being reveals that nowhere and at no time in the process has that value ever been named or specified. The product that is so rigorously bought and sold is an absence. And worse, there is literally no way that it could ever be otherwise. The programme is a very elaborate accounting exercise for a means of giving away money. When this becomes clear to an outsider, it also becomes obvious that this actuality of what the exercise is has never been hidden. When it comes down to it, this programme is a legitimate means for shifting money from the state coffers into the hands of private landowners.

Recognizing that this is a programme of environmental governance in a liberal parliamentary democracy in which the social technology of the political party is crucial, let me as your narrator temporarily put on a party-political hat. Corangamite is an electorate that has a history of swinging between choosing a member of the left-of-centre party (Labour Party) or a member of the right-of-centre party (Liberal Party) to represent the people of the area in the Victorian Parliament. It is clearly in the interests of any government—left-leaning or right-leaning—to appeal to the voters of the electorate. And there is no better way to do that than by finding ways to legitimately transfer resources from the state to the bank accounts of constituents. That there is no possibility of putting a number on the value of the product the state buys and the landowners sell here, is, on this reading, of no concern.

So, let me sum up. Economically this programme is justified as generating environmental services value. Described in this way this is a good news story. Taxpayer money used well to improve the environment and get trees planted to ameliorate Victoria’s excessive carbon dioxide generation. Problematically the increase in the value of Victoria’s natural capital cannot be named, articulated as a number, despite it being a product that is bought and sold. It seems that while there are still technical hitches, clearly, this is a good thing.
But equally, using a different economics this programme can just as legitimately be described as funding the labour of tree planting to enhance property values of private landowners. It is a means of intervening to put right damage caused by previous government programmes subsidizing the misallocated labour of land clearing that in all likelihood the landowner’s grandparents profited by, creating a benefit which the landowner continues to enjoy. On this reading the government policy effected in EcoTender is an expensive programme to legitimately give away taxpayer money. Clearly, this is a bad thing.

On Not Disrespecting Numbers and Algorithms: Staying With the Troubles of Value

So, what is a journalist to do? Writing as a scholar and not as a journalist, I can respond to that obvious question only vaguely. In the beginning I return to my claim that the number name used in the press release is a paper-thin cover-up to divert attention from lurking trouble. As I see it, valuation always brings moral trouble that can never be contained for long. The right question to ask I think is, “How might a data journalist respond to that moral trouble?”

First, I clear up the matter of the AUD4.94 million. What is this figure? Where does this neatly named monetary value come from? This is how it is described in an academic paper offering critical commentary on the EcoTender programme:

Under this market-based model economic value from ecosystems services is created when the per-unit costs of complying with the conservation contract are less than the per-unit price awarded to the successful participants in the auction. While [for these sellers] some economic value is lost through the possibility of foregone production of marketed commodities, the participation constraint of rational landowners ensures that there will be a net increase in [economic] value created in the conduct of the auction. (G. Stoneham et al., 2012)

Under the economic modelling of this policy, the assumption is that landowners will efficiently calculate the costs they will incur in producing the government’s script for intervening in nature as infrastructure—in generating a more efficient performance of the workings of natural infrastructure. Everyone assumes that a profit will be made by the landowner, although, of course, it is always possible that instead of a profit the landowner will have
miscalculated and made a loss, but that is of no interest to the government as the buyer of the value generated by the landowners’ labour.

What is of interest to the government is the issue of how this economic transaction can be articulated in a seemly manner. This is quite a problem when the product bought and sold has an existence solely within the circuit of an auction. The solution to this problematic form of being of the product is the elaborate, complex and complicated technology of the national accounts system. Establishing a market for ecosystems services value, the government wants to show itself as making a difference in nature. And the national accounts are the very convenient place where this can be shown in monetary terms. The “environmental benefits index,” the particular value on the basis of which the government has purchased a particular product—an environmental services value—is ephemeral. It exists solely as a flash, a moment in the auction (Roffe, 2015). Despite this difficulty in the form of its existence, by ingenious contrivance, both the means of buying and selling something that has a single ephemeral moment of existence is achieved, and evidence of the specific instance of economic activity can be incorporated into the national accounts, albeit that some economists have serious reservations about accuracy (G. Stoneham et al., 2012).

AUD4.94 million is remote from the action of the EcoTender programme and from the nature it is designed to improve. But clearly, if the government makes a statement that its programmes have successfully improved a degraded and damaged nature it is best to find a way to indicate the extent of that improvement. It seems any number is better than none in this situation. And certainly, this is a happy, positive number. An unhappy, negative number that no doubt is available to the government accountants—the value of the cost of running the government programme—would never do here. Why go on about this oddly out of place number name? Surely this is going a bit far? What is the harm of a little sleight of hand that is relatively easily picked up? My worry here is that this is a misuse of a number that seems to be deliberate. It fails to respect numbers, and refuses to acknowledge the trouble that numbering, or in this case algorithming, always precipitates. It trashes a protocol.

My narrating of a number I found on a visit to a government website has unambiguously revealed a government programme that generates social goods and bads simultaneously. The sleight of hand number naming (using the precise value AUD4.94 million in the media release) that I also found in my narration, points off to the side, at something that is always threatening to overwhelm us: Valuation as a site of moral tension and trouble.

Is the big claim here that value is moral trouble that can never be contained for long? Value theory is a vast topic that has ancient roots in all philosophical
traditions, and this is a rabbit warren of vast proportions that I decline to enter. I merely note that claims, often heard over the past 30 years, that the invisible hand of the market tames the moral trouble that tracks with value, are a dangerous exaggeration. Markets might find ways to momentarily and ephemerally tame value—as my story reveals. But the trouble with value always returns. Attending to that is the calling of the data journalist.

Here are a few suggestions on how a data journalist might respect numbers and algorithms—as protocols. When you are faced with an untroubled surface, where no hint of moral tension is to be found, but still something lurks, then “prick up” your ears and eyes. Attune yourself to numbers and algorithms in situ; work out how to think with a number that catches at you. Find ways to dilate the peepholes that number names cover. Cultivate respectful forms of address for numbers and algorithms in practicing curiosity in disciplined ways. Recognize that numbers have pre-established natures and special abilities that emerge in encounter; that the actualities of series of practices by which they come to be, matter. Be sure that when you can do these well enough, surprises lie in store. Interesting things happen inside numbers as they come to be.

Works Cited


About the Author

Helen Verran is a Professor at Charles Darwin University and has been puzzling about how numbers come to be since meeting some quite amazing numbers in Yorubaland in Nigeria many years ago.