Dementia, Rhetorical Schemes, and Cognitivie Resilience

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Abstract: I argue for the importance of rhetorical schemes for understanding, diagnosing, and coping with forms of dementia. Schemes give salience (recruit attention), memorability (affect storage and facilitate retrieval), and aesthetic effects (induce a pleasurable emotional response) to configurations of language. They do so because of the way they play to neurocognitive pattern biases, like repetition, sequence, and position. Dementia is a condition under which language ability degrades, alongside memory and attention, but pattern biases appear to be comparatively robust, and schemic configurations become more and more frequent in dementia speech. Rhetorical schemes, that is, are notably resilient to the forces that diminish language use in individuals with dementia.

> With enough improvement in Rhetoric we may in time learn so much about words that they will tell us how our minds work.
> —I.A. Richards, *Philosophy of Rhetoric* (1936, p. 91)

0. Two Tales of Resistance

I have a neighbor, just into her seventies. She walks her dogs past my yard daily, and when she finds me puttering about, she infallibly asks, with a mischievous grin, "Are you working hard, or hardly working?" Same question. Every time. My neighbor is resisting the incursions of Alzheimer's Disease, resisting the erosion of her memory and her Self, and her armament includes rhetorical figures.

Second tale. My father's early education was in a one-room school house in northern Canada with very limited resources. It was the Great Depression. Much of his learning was oral, with an emphasis on the memorization of narrative poetry—Tennyson, Kipling,

Service. He often enjoyed through the subsequent decades, in the company of friends, family, and whiskey, reeling off long, dramatically enacted, stretches of this poetry. But by his eighth decade, beset with dementia, he had become a shuffling, mumbling, slump-shouldered old man who could barely communicate. I bought a book of Robert Service's poetry, sat down beside him, and began reading aloud.

> There are strange things done in the midnight sun
> By the men who moil for gold;
> The Arctic trails have their secret tales
> That would make your blood run cold;
> The Northern Lights have seen queer sights,
> But the queerest they ever did see
> Was that night on the marge of Lake Lebarge
> I cremated Sam McGee. (Service, n.d. [1907])

I was looking for any kind of acknowledgement, but his face remained slack. He was very hard of hearing, too, which made the whole idea ludicrous.

But soon he was looking down at the book in my hands. He hadn't read anything in years, but after a time he reached over, took the book out of my hands, and started running his finger along the lines of poetry, nodding almost imperceptibly. I could no longer see the words myself, so I left off reading. He continued to trace the lines. He traced them to the end of the page and turned the page to continue on the verso. But he turned two pages at once, so that he was looking at a different poem now. 'OK,' I thought. 'He was just running through some muscle-memory ritual. He has no idea what he is looking at.' Then, a fleeting miracle. He turned one page back, put his finger under the line at the top of the page, the correct line from where he had left off, followed it through to the end of the poem, and stopped.

Like my neighbor, he was using rhetorical figures as a way to fight his dementia, not the direct conversational resistance that she is putting up, but a way to clear off some of the fog for a few moments by reaching deep into his pre-dementia memories for linguistic nuggets of *isocolon*, alliteration, rhyme, and assonance: linguistic configurations with cognitive resilience.

1. Introduction

Rhetorical figures are neurocognitively motivated linguistic assemblages which achieve degrees of salience, memorability, and aesthetic pleasure by the way they recruit our biases for particular patterns and relationships. Their neurocognitive resonances enable figures to make specific colligations and constructions more resilient to the fragility of memory, individual and cultural; to the vagaries of attention, individual and cultural; to the presence of noise, internal and external; and to any combinations of the above. "An apple a day keeps the doctor away" is readily available to us when we are offering or commenting upon nutritional advice because it leverages rhyme (but not only rhyme) to effect a salient expression that propagates naturally in our culture, a mnemonically durable colligation that comes readily to individual speakers.

Figures have been catalogued and studied for millennia along linguistic, semiotic, and formal dimensions, with schemes and tropes the two most robust categories. Those categories are the only two I will reference in this paper, with a decided focus on the former, schemes. While tropes certainly play a role in the cultural and individual cognitive resilience of colligations and constructions, they are conceptual figures and therefore less tractable on a number of measures, so they show up only incidentally in what follows.

Schemes are material figures. They attract and maintain attention and stimulate aesthetic responses because of the patterning of their *signantia* (representamens, signifiers). We can take rhyme as our prototype. It occurs when at least two words end with the same syllabic nucleus and (optional) coda: an apple a d*ay* keeps the doctor aw*ay*.[1] Repetition reinforces the acoustic percept, presumably by activating very similar neural firing patterns, and when acoustic percepts are linguistic they have semiotic dimensions—meanings—so colligations like our *apple-a-day* proverb are resilient against the forces that degrade memory (forces I will collapse under the information-theoretic label, *noise*). That is: the form has neurocognitive durability, and the meaning is

[1] The terminology here is from autosegmental phonology (e.g., Goldsmith, 1976); in more traditional terms, this definition would read as '… end with the same vowel and final consonant(s), when present, or the same vowel-consonant(s) sequence.'

packaged with the form.[2]

The history of schemes reveals their powers of cognitive resilience. There is no evidence they were named or catalogued before 5th century BCE Greece, but figural instances are recorded much earlier; it is, in fact, very difficult to find any early text that is not overtly figured. And that early figuration indicates clearly that one of the chief functions of figures was to resist message degradation both individually and culturally. In pre-literate societies, there are few external technologies to fight the vulnerability of information in individuals and in their cultures,—no writing systems, no notebooks, no digital protocols, no smart phones—very little beyond the individual mental resources of people and the distributed mental resources of their tribes, guilds, families and other information collectives; collectives which in turn depended on the mental resources of individual members. Rhetorical schemes aided the individual retention and the cultural transmission of history, technology, political arrangements, religious systems, ethical and practical maxims, and so on, in both stand-alone heuristics and amalgamated as mythical narratives. This has been well understood since at least the research of Milman Parry and Albert Lord on the great skeins of such information in epic poetry (Parry, 1971; Lord, 1960; Havelock, 1963; Rubin, 1995). Schemes were not just the vehicles of procedures and facts. Wisdom itself was necessarily dependent on schemic patterns in preliterate societies, since wisdom relies on a framework of memory. "Serious thought is intertwined with memory systems" in preliterate cultures, Walter Ong tells us: "Your thoughts must come into being in heavily rhythmic, balanced patterns, in repetitions or antitheses,

[2] I realize that some readers may balk at my evocation of the pre-historic transmission/receiver model of Shannon and Weaver (1963) in the context of neurocognition, which we know is more dynamic, multiplex, and interactional than that model seems to support. Jordynn Jack, in fact, frames her *Raveling the Brain* in distinct opposition to the fantasy "that the brain … can be simplified from a complicated, tangled network of neurons and synapses to something as uncomplicated as a single strand of thread" (2019, p. 2). In the Shannon and Weaver case, the single strand is a telegraph line. But it provides a conceit that, in one of the most common and powerful uses of metaphor, provides two sorts of simplifications with research virtues: reductionism and reification. My topic is big and diffuse. I am trying to make headway by concretizing and constraining it analogically. If and when we make sufficient headway into the neural correlates of pattern biases, attention, and so on, we might be able to ravel that telegraph line into networks. For now, we will have to make do with speculative approximations, not large-scale, fully raveled theories of the intersection of rhetorical figures and language pathologies.

in alliterations or assonances, in epithetic and other formulary expressions" (2002, p. 34).

We still use schemes to the same end, with the much smaller information skeins we keep handy for verbal deployment in our literate and digital cultures. I don't know how accurate its predictions are, but the maxim "red sky in morning, sailors take warning; red sky at night, sailors delight" is a heuristic for making weather-based plans. It contains a double-dose of rhyme, of course, but also *parison* (structural repetition; AKA, "syntactic parallelism") and *isocolon* (prosodic repetition; AKA "phonological parallelism"), as well as the trope, antithesis (and, for good measure, an ethotic appeal to those presumed weather authorities, sailors). Our *apple-a-day* nutritional heuristic features also features *isocolon* along with the rhyme—they often travel together, sometimes under the label, "poetry"—as well as some additional assonance (vowel repetition). "A friend in need is a friend indeed" is a social heuristic, with two instances of rhyme and some *ploke* (lexical repetition). "A penny saved is a penny earned" is an economic heuristic featuring *ploke* and *isocolon*. "Cleanliness is next to godliness," a personal hygiene heuristic, features *homoioptoton* (affix repetition on different lexical stems). And so on. Kenneth Burke famously called such cultural colligations as these, as well as poetry at large, "equipment for living," mechanisms for "arming us to confront perplexities and risks" (1941, p. 61). He did not, so far as I know, have dementia in mind as among those perplexities and risks.

2. Dementia and Cognitive Resilience

Cognitive resilience is a term used of individuals and populations in dementia studies. It is a hypothetical construct, a reification, for the observed resistance to mental decline (that is, for the lack, relatively minor degree, or slow development of clinically attested cognitive symptoms) in the presence of factors correlated with dementia—evident most dramatically in people who show no particular failings in their memory, speech, or daily functioning, but whose brains after death are discovered to have physiological signatures of Alzheimer's disease (such as protein tangles and beta-amyloid plaques).[3] Certain brain structures (such as vigorous dendritic

[3] Characteristic of terminology in many areas of study, especially those with multiple distinct specialties contributing to them, the term *cognitive resilience* is not without complications. In fact, a Whitepaper on the usage is currently in development now, headed up by Yaakov Stern, who

spines; Boros *et al.*, 2017) and aspects of personal history (such as strong teenage literacy; Fearon, 2017) correlate with such resistance. Many of those aging warily all around us are trying to inoculate themselves against dementia by such practices as playing sudoku, doing crosswords, learning foreign languages, and the like, activities alleged to build cognitive resilience.

In this paper I pare away a bit of the analogic extension of the phrase, *cognitive resilience*, and use it to describe not people or populations (though I'm content to let that usage stand as well, in other contexts), but those material features of language that enhance the neurocognitive signal-to-noise ratio of colligations and constructions. *Resilient*, after all, is at base level a word for *material* integrity. It springs from *resilīre* (Latin), 'to jump back, to retire, withdraw, to recoil, shrink, to bounce back, rebound, to spring back, recoil, to return to a smaller size' (Oxford). It suggests an elasticity, a capacity to regain an original form after deforming

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originally introduced the related concept, *cognitive reserve*. See Stern *et al.*, in press; this paper has apparently been completed but is under embargo for unstated reasons. The journal has published an abstract of the paper in their "Articles in Press," with no date or volume information (http://www.alzheimersanddementia.com/article/S1552-5260(18)33491-5/fulltext), but nothing further is available from the journal. Meanwhile, PubMed (citing a September 2018 publication date!), states that "This article has a delayed release (embargo) and will be available in PMC on March 14, 2020" (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC6417987/). When it becomes available, it should make for interesting reading.

In the meantime, we can go with a standard operationalization. In her study of literacy as a factor in dementia-resistance, for instance, Danielle Fearon (2017) defines *cognitive resilience* as the characteristic of "avoiding the clinical symptoms of dementia despite having Alzheimer neuropathology present," defined "as not meeting the clinical diagnosis of dementia according to DSM-IV criteria at last assessment while fulfilling CERAD neuropathologic criteria ("definite" or "probable") or NIA-RI neuropathologic criteria ("definite", "intermediate" or "high" likelihood) for AD," following the National Institute on Aging guidelines (Hyman *et al.*, 2012). (Abbreviation legend and references: AD = Alzheimer's Disease; CERAD = Consortium to Establish a Registry for Alzheimer's Disease (Mirra *et al.*, 1991); DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (American Psychiatric Association, 1994), NIA-RI = National Institute on Aging, and Reagan Institute (NIA-RI Working Group on Diagnostic Criteria for the Neuropathological Assessment of Alzheimer's Disease, 1997.)

pressures have passed; in effect, to withstand the forces that derange and distort material.

Proverbs retain their material integrity against cultural forces. That's how they become proverbs. That cultural robustness, in turn, depends on their cognitive resilience, since multiple individuals need to store, retrieve, and speak proverbs for them to propagate and lodge in a culture. They "are constantly heard by everyone so that they come to mind readily and … themselves are patterned for retention and ready recall" (Ong, 2002, p. 34). The culture and the individual are in a feedback loop: the more frequently an instance is spoken, the more culturally entrenched it is; the more culturally entrenched it is, the more frequently it is spoken. Configurations of language are resilient because of the neurocognitive resonances they activate.

The paired information-theoretic notions of 'noise' and 'redundancy' are helpful for understanding cultural robustness and cognitive resilience. The core analogy of noise in information theory is to acoustic noise that impedes aural communication. It's harder to talk on a factory floor or in a crowded bar because of all the competing sounds, the noise. So, we shout, gesture, extravagantly mouth our words, and so on, to get our messages across. We deploy strategies of redundancy—additional communicative features alongside or overtop the basic signal—to ensure the more reliable reception of our message. But information-theoretic noise is not strictly auditory. It might also be an arresting visual distraction in the communicative environment, or a blast of cold air, or a headache, something that causes at least some of the parties to lose attention; or it might be part of the signal itself, such as the slurred speech of a drunk, or a strong accent, or drop-outs in a telephone call. Anything that interferes with signal transmission or reception is noise. Dementia brains are noisy; or, perhaps more precisely, are more vulnerable to noise. Anything that overcomes noise in these terms is redundancy—which brings us back to dementia, and to my neighbor's *hardly-working* formula.

Like most cognitive syndromes, dementia is not uniform. I am collapsing much variability for the sake of useful generalizations. In that spirit, we can define dementia as a clinical diagnosis of cognitive impairments, primarily of activities implicating memory, with significant linguistic correlates.[4] The language-related

[4] Dementia can be caused by a variety of conditions, including degenerative diseases, stroke, depression, and head injury, but many

impairments almost inevitably become severe enough to hinder an individual's ability to function in daily life, from minor levels of lexical-search problems that impede or preclude conversation or recalling instructions to more severe levels of incapacity, including even identity-defining memories, such as the names of one's children.

3. Dementia and Rhetorical Figures

I do not have a theoretically informed and validated theory of memory at play here. In my defence, psychologists don't seem to have one either. They understand lots of the molecules involved in memory, and much of the neuroanatomy, and they have empirical results about recall capacities under various conditions, and they have pictures of blood flow in the brain under all kinds of stimulation. They also have hypotheses, partially integrated with these data. Maybe there are separate short-term and long-term subsystems. Maybe semantic and episodic information is 'stored' and 'retrieved' in different ways. Maybe working memory includes a phonological loop. But there are vast areas of neurocognition that psychology doesn't know with true clarity, precision, or comprehensiveness. Psychology can't say, for instance, how language is represented neurocognitively, or what it means to hear familiar or novel sound sequences, or how rhythms activate emotions. And it can't say anything very definitive about memory at the level of interest relevant to these speculations.

Instead of a theoretically informed and validated theory of memory, I have a productive pastiche of association and faculty psychologies, of perception experiments, largely from the Gestalt school, and of intuition. We all know, for instance, that repeating a phone number, or a name, or a narrative poem over and over to ourselves, vocally or subvocally, will help us remember it. We seem to be 'practicing' knowing it until we actually do know it, and the fact that neurons fire in patterns (that is, fire *repetitively*) in correspondence to stimuli suggests a mechanism whereby the number or name or poem becomes neurocognitively entrenched. Whatever. We all know that repetition is a factor in remembering information. We know that such notions as similarity and difference are perceptually important (shown in Gestalt

conditions are age-related, and dementia mostly affects the elderly. The most common cause of dementia is Alzheimer Disease, a progressive, degenerative disease of the brain (Alzheimer Society of Canada, 2010; Tyas & Gutmanis, 2015).

experimentation) and endemic to our categorization (a theme in psychology at least as far back as Aristotle)—perception and categorization both being central to memory. There are other such factors at play in memory, and we will see some of them later (such as sequence), but we can proceed for now with these three (repetition, similarity and difference): "An apple a day keeps the doctor away" is cognitively resilient, we can say with confidence, because the syllable /ej/ repeats; because the prosodic structure of "apple a day" repeats in "the doctor away;" because *day* and *away* are similar (they share a syllable); because *day* and *away* are different (they both have different onsets to their syllabic nuclei and the latter also has an additional syllable); that is, because the colligation plays to the ways our mindbrains are structured.

We have no idea how schemes arose, though it is difficult to believe they are products of conscious invention. While individual rhyming colligations, like "fun in the sun," are personal creative inventions (or were at some point), rhyme itself not a personal creative invention. Just as metaphor is what you get when you add language to a mindbrain that works analogically, and antithesis is what you get when you add language to a mindbrain that works contrastively, so too is rhyme what you get when you add language to a mindbrain that works on repetition. Or, if rhyme can be said to be invented, so too was rhythm, affixation, grammatical roles, predication.

There is something different about rhyme, however, that sets it apart from the flow of affixes, grammatical roles and predications from which it stands out, something that gives it the power to make expressions more cognitively resilient, something figurative.

What makes rhyme different from 'just' language, the kind of language that grammarians and linguists generally care about—phonotactics, subject-verb agreement, denotation, conventional syntax—the aspects of language that comprise the ground against which figures stand out? Nothing that is hard and fast. After all, lots of words in the routine flow of language rhyme—*hum-drum, itsy-bitsy*, *artsy-fartsy*. But the default distribution of syllables in a language, within certain constraints, is 'arbitrary.' Rhyme is non-arbitrary. Indeed, syllable distribution willfully avoids rhyme: "languages of the world frequently show evidence of conspiracies to avoid 'accidental' repetition of phoneme strings" (Menn &

MacWhinney, 1984, p. 519).[5] The upshot is that it is uncommon for the same syllables to show up at the ends of words within hailing distance of each other. Rhyme seems, therefore, like something 'extra,' something that is overlaid on 'just' language, on everyday language, bland language, hum-drum language; something redundant. That's how figured language is always perceived—as standing out from 'just' language, violating its expectations in some way, deviating. That sense is not quite right, of course, because figures are woven into the fabric of everyday language. But it's right*ish*, a kind of productive fiction, like the one physicists employ when they pretend weight and mass are different even though they never occur separately in matter. Groupe μ calls the fiction of figureless, arbitrary language, "degree-zero language" (1981, p. 217), a hypothetical construct against which we define figural 'deviations.'

My neighbor's frequent question to me (and related variants) stands out from the expectation of bland, arbitrary, degree-zero word distribution:

1. Are you working hard, or hardly working?

This expression is culturally entrenched as a blue-collar cliché, familiar among construction workers, road crews, factory workers, and so on. Individually, it is entrenched in my neighbor with Alzheimer's Disease. The neurocognitive features of colligations like 1, and of poetry like "The Night I Cremated Sam McGee," can help arm us against the perplexities and risks of cognitive decline.

[5] At the same time, however, Menn & MacWhinney note that there are strategies of repetition in those same languages that correlate with meaning; namely, those of "reduplication –which deliberately repeats material within morphs … in order to mark certain grammatical contrasts, achieve emphasis, and express relations iconically. Thus we see languages formally sanctioning the 'deliberate' repetition of all or part of a morph, even while going out of their way to prohibit 'accidental' repetition" (Menn & MacWhinney, 1984, p. 519). Aitchison (1994, p. 17) sees the prohibition and the sanction as paradoxical, but as rhetoricians, we realize that one does not get strategies of salience and form/function correspondences without a 'literal' ecology, a figure without a ground. We see this at play in the mechanisms languages provide to reduce lexical and phrasal repetitions as well—principally proforms and zeugmas. With no general restrictions against phonological repetitions, such specific repetitions as rhyme or alliteration would be invisible and meaningless.

The pattern underlying 1 is chiastic, a class of figures that repeats linguistic constituents in reverse order. Its most famous instance is perhaps by Alexander Dumas:

2. [T]ous pour un, un pour tous. (1849, p. 129)
   All for one, one for all. (2010, p. 80)

Our "working hard" example (1) is actually quite tricky in figurative terms. It is not an *antimetabole* like 2 (reverse lexical repetition), for instance, because only one word repeats, *working*. The *hard*/*hardly* alternation of 2 looks superficially like polyptoton (a theme-and-variation figure, similar-but-different, in which the lexical stem repeats with different affixes), but it's only loosely polyptotonic. Polysemy is at play: *hard* in this colligation can be paraphrased with something like *steadily* or *diligently*; *hardly* can be paraphrased with something like *barely* or *very little*. That is, *hard*/*hardly* is not a lexical repetition (construed as the repetition of *signans-signatum* pairs), but only a formal repetition (just the *signans*).

I emphasize this fact to make a point about the form of 1. The shifts of meaning and lexical relations are intricate, two linguistic factors that give people with dementia particular difficulties. My neighbor does not retain and deploy this phrase because of its lexical sophistication so much as because of its form, which we can perhaps see more clearly in an acoustic representation (Figure 1).

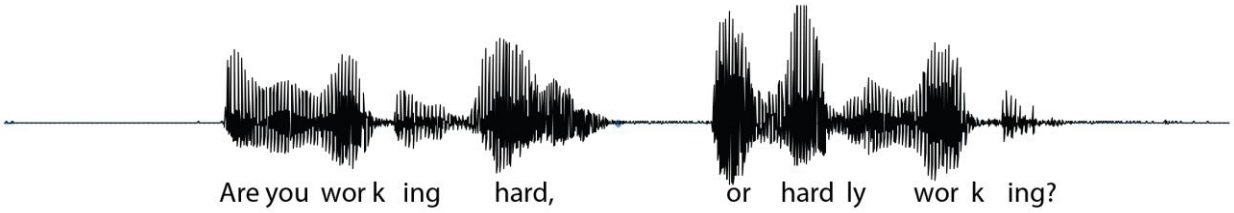

Figure 1: An acoustic representation of a typical formulaic expression used by someone with mild Alzheimer's disease

Figure 1 only represents a loose correlation between the speech sounds (symbolized by letters) and the related acoustic signal, but it is close enough to make the point. In particular, notice the two highly similar clumps corresponding to *working*, and the similar syllabic nuclei with the two instances of *hard*. There are specific, identifiable reasons why this expression is a formula in blue collar registers: themes of work and effort are bound into a structure that resonates with certain neurocognitive biases, which makes it both

mnemonic and pleasing (or witty). The expression manifests two instances of repetition (*working* and *hard*[ly]), perhaps the deepest and most basic pattern bias. The expression also manifests a sequential contrast (reversal), another deep bias. (And topically, the theme of working with or without diligence in blue collar situations leads to frequent articulations, and therefore to familiarity.)

Like all such formulae, that is, 1 has internal patterns that make it more memorable, that give it resilience in the face of memory decline.

My neighbor is not alone. People with dementia speak very, very often in such formulae. It is one of the best-known characteristics of their speech. Kelly Ann Bridges and Diana Van Lancker-Sidtis (2013) define formulaic language in this context as "fixed expressions that are known to the native speaker," including "idioms, proverbs, speech formulas/conventional expressions, expletives and pause-fillers" (p. 5)—many of which feature figuration. Attested examples of formulae in dementia speech include:

3. Am I glad to see you girls.
4. As a matter of fact, …
5. Don't call us – we'll call you.
6. Likewise, I'm sure.
7. He snores to beat the band.
8. They must be worth their weight in gold.
9. Throws somebody a dirty curve.
10. To err is human, to forgive divine. (Van Lancker-Sidtis & Rallon, 2004, pp. 222-232)

The figurative patterns are pretty obvious here, but here's a quick tabulation of the more prominent figures:

Alliteration: 3 (*glad*, *girls*), 7 (*beat*, *band*), 8 (*worth*, *weight*; *they*, *their*)

Assonance: 3 (*am*, *glad*), 4 (*a*, *matter*, *fact*), 6 (*likewise*, *I'm*), 9 (*dirty*, *curve*)

Consonance (excluding alliteration): 4 (*of*, *fact*) 5 (*call*, *we'll*), 8 (*they*, *worth*, *their*)

Epanaphora: 10 (*to*)

Hyperbaton: 3 (*Am I*)

Isocolon: 5, 10

Mesodiplosis: 5 (*call*)

Parison: 10 (Vinf < Adjective)

There is yet more figural activity here, of course, including a few tropes, the *antimetalepsis* of 5 ('[you] call us' / 'we'll call you'—like 1, a chiastic figure, this one a inversion of *signata* without *signantia*), the metaphor of 9, the antithesis of 5, perhaps a meiosis (understatement) in 3's *girls*, depending on who the referents are, but also the easily overlooked effects of lexical repetition. The *mesodiplosis* of 5 and the *epanaphora* of 10, in particular, give us alliteration and rhyme, since the repeated words necessarily begin with the same consonants and end with the same syllables. Schemes can sometimes entail other schemes in this way, which is almost always ignored in the discussion of figures but shows how the subcomponents of something like lexical repetition (namely, phonological repetitions) contribute to the cognitive resilience of the relevant utterances.

In short, speaking in colligations of the sort that dementia researchers tag with labels like *idioms*, *prefabrications*, *fixed expressions*—even, occasionally, *schemata*—is a well-known feature of dementia speech, with occasional explanations about lowering the cognitive burden or compensating for a decline of memory, since one preassembled block of speech is assumed to be easier to retrieve than a bunch of independent component words, and since familiarity is closely related to entrenchment. But there is little to no attention paid in dementia research to *why* particular colligations cohere into such formulae. Cue the rhetoricians.

In rhetoric the presence and texture of these formulae correlates with what we know by way of Burke's label of *collaborative expectancy* (1950, p. 58). A pattern, once known or felt, demands

its own completion. Charles Sanders Peirce coined two brilliant terms for this process, conceptually flanking *percept*, the sensual experience of a phenomenon: *ponecept*, the recent memory, the neurocognitive echo, of a percept, and *antecept*, the neurocognitive formation of an anticipated percept (CP 7.648; Peirce, 1966, p. 382).[6]

Ponecepts are what enable patterns of repetition. There can be no experience of *mesodiplosis*, for instance, unless its first element (*call*$_1$ of 5) remains at some level of attention, is a *ponecept*, when the second element arrives as percept (*call*$_2$). *Isocolon* would be impossible without a *ponecept* of prosody, *parison* without a *ponecept* of syntax. *Antecepts* are the agency of collaborative expectancy. There is no expectation of an imminent percept (*band* in 7) without the formation of *antecepts* (primed by the sequence "to beat the," with its saliently 'alliterative' *antecept*, *beat*).

Dementia formulae, that is, very frequently resonate neurocognitively, which is precisely what makes them more resilient against cognitive decline. Their prosodies are often roughly 'musical' or 'poetic,' with parallelisms and balance, and music is perhaps the most resilient signal structure we know against memory loss (e.g. Baird & Thompson, 2018); the resilience and ameliorative effects of poetry are less well known, but my Sam McGee anecdote illustrates them nicely, and they are beginning to gain clinical and research attention (Swinnen, 2014). The resonant formal qualities of many colligations are the primary reason why some of them are more persistent in dementia speech.

To no rhetorician's surprise, I am sure, dementia research has not turned to rhetorical figures for an account of why the formulae emerge symptomatically in the first place, why they have lodged in patient's memories, or what features support their ready and recurrent retrieval, and their more fluent articulation. But rhetoric does have answers to suggest.

4. Pattern Biases

As Jeanne Fahnestock notes, "humans prefer patterns in perceptions" (2004, p. 124), and we prefer some patterns more than others. Figures achieve their effects "because of some

[6] We know that Burke read his Peirce, but it is not surprising he didn't pick up these terms himself; they were unpublished during Burke's period of feverish autodidacticism.

'universal' appeal" (Burke, 1950, p. 58) to the mental and physiological structures between our ears. In Peircean terms, there is a ready store of schematic *antecepts* (anteceptual schematics?) in the wait. What the precise catalogue of such pattern biases is remains to be worked out, as well as the ways in which they interact. Does Bias X carry more weight than Bias Y? What conspiracies of biases are more potent than others? What individual, cultural, linguistic, or pathological differences are there among the appeal of patterns? Considerable research needs to be done to even start addressing these questions.

But we do have some dementia data currently on the table (Expressions 1, 3-10), and a few pattern biases are clearly relevant: repetition, demarcation, and sequential order.

While it is notoriously difficult to link most cognitive processes or inclinations to the wetware that instantiates them—some cognitive scientists even talk of an "incommensurability between the languages of neuroscience and psychology" (Kagan & Baird, 2004, p. 100)—repetition is one phenomenon that is irrefutably common to both areas, to both 'languages.' We know, for instance, that neurons fire repetitively. We know that neural pathways build up by repetitions of the same firing patterns. We know that the most fundamental dynamic structures of cognition are brain rhythms; that is, highly repetitive neural firing patterns. We also know that when we want to remember something, we repeat it to ourselves over and over. Repetition is so obviously a matter equally of electrochemical neural activity and of cognitive salience that data is hardly required.

Should we seek experimental verification, however, it is easy enough to come by. Bornstein (1989), for instance, conducted a meta-analysis of over two hundred experiments demonstrating the robustness of the mere-exposure effect, also known as the familiarity effect—repeated encounters with any stimuli whatsoever biases people toward those stimuli. In the case of formulaic speech, repetition not only contributes a kind of adhesion in the specific colligations (assonance, consonance, rhyme, *isocolon*, and *ploke* are all very frequent schemes in dementia formulae), repeatedly spoken and repeatedly encountered colligations wear the neural grooves more deeply, encouraging their presence in the flow of speech. As Joan Bybee has noted, "frequency of use affects the formation of grammar" (2006, p. 719). While rhetoricians (yours truly at least) might not be comfortable with the hegemony of the term *grammar* here, Bybee is certainly right that the more you hear and say

linguistic structures, the more predictably you will use them again; the more frequently you hear and say particular colligations, the more predictably they will reappear.

Our cognitive and linguistic trafficking in sequential order is also deeply entrenched neurologically. A neural pathway, after all, is a temporal pattern, one firing activating subsequent firings in a given sequence, repeated again. We live in time and we speak in time. Linguistically, we give directions, write instructions, share recipes, tell stories, and perform a thousand other speech genres that are dependent on what comes before what, and formulaic colligations by definition are sequential patterns that become entrenched. Rhetorical theories of memory are often seen as spatial, and they are. Memory palaces are organized in space. 'Parts' of the argument are distributed in various locations throughout the palace, "in an architectural design of places" (Hutton, 1987, p. 371). But the places are not randomly distributed and the palace is activated in the course of giving a speech as an embodied sequence. "We have to think of the ancient orator as moving in imagination through his memory building *whilst* he is making his speech," Frances Yates tells us,

> drawing from the memorized places the images he has placed them. This method also ensures that the points are memorized in the right order, since the order is fixed by the sequence of places in the building. (Yates, 2013, p. 3)[7]

One can see the power of sequence in terms of general perception and categorization with the Gestalt notion of good continuation (Koffka, 1999, pp. 153-154 et passim) and in terms of rhetorical figures with Burke's collaborative expectancy. Recall that what Burke tells us is that when we get the gist of a pattern, we

[7] While I take a largely amodal neurocognitive stylistic approach in this paper, another of the canons may also prove valuable for the intersection of rhetoric and dementia, delivery. This passage from Yates reminds us that mental activity is embodied, in that one does not just pluck a memory from the palace in some abstract way but by imagining one's body performing actions. Gibbs (2005, pp. 148-151) outlines how performing actions and activating neural circuitry associated with bodily actions is implicated in linguistic memory. My father's experience in learning "The Cremation of Sam McGee," for instance, was not a matter of wrinkling his brow and staring at a page, but of reading aloud to the class, rehearsing passages to siblings and to the great outdoors as he strolled back to the farm, performing it to his parents; that is, of regularly enacting the poem through bodily activities.

"collaborate [with it] by spontaneously willing its completion and perfection as an utterance" (1950, p. 59); that is, our *antecepts* surface and push the completion of the pattern that has been established by the *ponecepts*. We take up the sequence and continue it.

Repetition and sequential order are utterly intertwined. What is a lexical repetition (*ploke*) but a repeated sequence of phones (or letters), a syntactic repetition (*parison*) but a repeated sequence of phrases, a prosodic repetition (*isocolon*) but a repeated sequence of variously stressed and unstressed syllables? What is a culturally and cognitively robust lexical colligation (maxim, gnome, *sententia*, proverb, cliché, prefabrication, …) but a sequence of words that has been repeated often enough to become cognitively and culturally entrenched?

And there is another pattern bias integral to the repetition/sequence complex, of equal significance for the neurocognitive pull of rhetorical figures: position, which can be 'mutual' or 'local.' We can only have a sequence of elements if the elements are mutually ordered: some elements come before other elements; conversely, with a shift in perspective, some elements come after other elements; and, therefore, some elements come before and after differing elements (that is, between them). That's mutual position, and it is important in a sequence when there is something shifting characteristically, most notably in tropes like *incrementum*, when the value of some semantic attribute increases, as in the monetary increase of 11.

11. My son, even if you were to give me all the silver and gold, precious stones and pearls that are in the world, I would not dwell anywhere except in a place of Torah. (Pirkei Avot)

Abeles, Jack, and Singer, in this issue, show the multimodality of scalar sequences in their discussion of pain judgements.

Mutual position is also definitive for the chiastic figures, like my neighbor's refrain (1), in which the same elements precede and follow each other. The standard formalism for chiastic figures captures this mutuality of relative position nicely: ABBA.

In 'local' terms, position is relative to *landmarks*, adapting a label from Ron Langacker's Cognitive Grammar (e.g. 1987, p. 217ff). Three local positions are important for schemes, *initial* and *final*—

that is, at the "edges" or "boundaries" of figural constituents—and *medial*, between such edges.[8] As perceiving organisms, we need sensitivity to "edges" or "boundaries" to navigate the world, because they signal a shift in perceived objects. Maria Chait frames it in these terms: "edge detection is one of the fundamental processes [upon] which object detection – a more complex process – is built" (2006, p. 217). It is easy, or at least intuitive, to understand this process in visual terms. Significant changes in brightness (often abetted by changes in hue) correspond to regions of visual perception where a pencil 'ends' and the paper upon which it lies 'begins,' where the paper ends and the desk begins, the desk ends and nondesk emptiness begins. These impressions are supported by extensive neurophysiological and cognitive research, which has assigned these tasks to specific neural mechanisms (see Elder & Sachs, 2004 for a summary of relevant research). Similar mechanisms are at work discriminating acoustic 'objects,' auditory sensations that correspond to discriminatory differences, a process called "auditory edge detection" or (since sound is ineffably temporal) "temporal edge detection." Chait defines this process as "the neural basis of [a] listener's ability to make sense of an ever changing, complex acoustic world" (2006, p. 3).

Auditory or temporal 'objects' might seem abstract at first pass, but we understand and categorize temporal phenomena through reification, such as 'the roar of a lion,' 'the snap of a branch,' 'the burp of an infant.' These are all events that have a duration, but by assigning them nouns we treat the roar every bit as corporeally as the lion, the snap as the branch, the burp as the infant. If one thinks in musical or speech terms, acoustical objecthood may seem more natural: notes, in the first place; phonemes, syllables, words, phrases and clauses in the second. The mechanisms for edge/object detection in language are complex and multifactorial, and very language specific—for instance, one of the ways we know that the sequence *bingbong* should be segmented as *bing* | *bong* is because no syllables or words in English can begin with *ng* (phonetically, the sound is represented as [ŋ]), so *bi* | *ngbong* is ruled out. Other languages, like Vietnamese or Cambodian, in which [ŋ] can begin words, might segment the sequence differently. But the important

[8] While Richard Gregg does not consider rhetorical figures at all in his neglected (1984) classic, *Symbolic inducement and knowing*, his neurorhetorical approach has been important to my research generally and his attention to edge discrimination (pp. 33-40, *et passim*) is especially important for the line of research here. The actual neuroscience in Gregg's book is somewhat dated, but the results appear to have held up.

point is simply that language users do, naturally and easily, most of the time, perceive objects like phonemes, syllables, and words, which means they perceive the relevant boundaries, the edges where one such object ends and another begins, even though the actual acoustic signal is usually one big schmoosh. As Figure 1 shows, the syllables do not have sharp separations. They blur into one another.

It is this tuning-to-edges that makes beginnings and endings particularly salient locations of figural action, especially in combination with repetition, giving us such figures as alliteration (phoneme repetition at the beginning of words), rhyme (syllable repetition at ends of words), *epanaphora* (lexical repetition at beginning of phrases or clauses) and epiphora (lexical repetition at ends of phrases or clauses). Abeles *et al.*, in this issue, discuss positional lexical repetitions in the context of wind-turbine protests, showing how common they are in ordinary language (2019).[9]

5. Rhetorical Schemes or Linguistic Symptoms?

Prefabricated utterances in neurocognitively biased packages are obviously rhetorical, in the sense of fitting into the patterns rhetoricians have investigated for millennia, but their rhetorical *activity* is not so obvious. They are not quite dead figures in the way that *table leg* is a dead metaphor and *seat of a chair* is a dead metonym, words whose figural roots are so deep as to be completely lost. One cannot say or hear *rolly-polly* or *red sky at night, sailors delight* without their figural presence standing out from the prosaic ground. Around my family home, one could not even stumble into a rhyme, a wholly accidental collocation of word-final syllable repetition, without someone saying "you're a poet and don't know it."[10] Because they are primarily material, rather than conceptual, it is hard to kill and bury a scheme. Dead or dormant tropes are like underwear or socks, obscured by other material; schemic prefabs

[9] Abeles *et al.* use the term *epistrophe* for clause-final lexical repetition. I prefer *epiphora* because of its formal (and etymological) contrast to *epanaphora*, clause-initial lexical repetition.

[10] Apparently there is more to this formula than I originally knew, in a dementia poetry intervention, one of the participants came up with an extended version, replete with paronomasia: "He's a poet and doesn't know it, but his feet surely show it, cause they're Longfellows" (Swinnen, 2016, p. 1388).

are more like outer wear or hats, unmistakably on the visible surface.

What about in the pathological context? How rhetorical are schemic prefabs with respect to dementia? There are two directions this answer can take, in terms of production and in terms of interaction or treatment. On the one hand, they are diagnostic. An increasing use of prefabrications against previous speech patterns and/or a linguistic baseline can signal cognitive impairment. Prefabs are one of several linguistic indicants of cognitive impairment in dementia.[11] Other linguistic indicants include, for instance, a marked decrease in unique words in a given dementia language episode: once words enter an episode, they are recycled with high frequency, which means an overall lower vocabulary range. There is also a strong trend toward 'light words,' so-called because of their low 'semantic weight' (words such as *thing*, *place*, and *stuff*). But it is worth noting in this context that they are also the most frequent terms in their domains (that is, repeated more often in general discourse). They are encountered more often, and so they stay closer to the front of the neural-pathway rolodex (Bybee, 2006).

In figural terms, boundary repetitions of sounds as well as words is increasingly common as dementia advances. Take these two examples which satisfy the standard definition of *epanaphora* ("[r]epetition of the same word at the beginning of successive clauses or verses" [Lanham, 1991, p. 11]):

12. I say to my wife
    I say in here
    and I can't think of words (Meteyard & Patterson, 2009, p. 129)

13. Lost my teddy
    Lost my book
    Lost my keys
    Lost my bird
    Lost my love
    Lost my way

[11] The term common in the dementia literature is actually *linguistic biomarkers*. My preference for *linguistic indicants* is an attempt to reserve *biomarker* for more obviously physiological markers of pathology, such as the presence of amyloid plaques or neurofibrillary tangles in Alzheimer's Disease.

Lost my mind
Lost my soul (Swaffer, 2012) [12]

Example 12 is classed as an error (specifically, a disjointed planning error), of the sort we are all capable of committing now and again. But the scale goes way up in dementia. Example 13 is classed as a poem, a particularly moving one given its authorship by Kate Swaffer, who has dementia.

Taking them in turn, is 12 a rhetorical figure? Can an error be a figure? By the poet-but-don't-know-it metric, spontaneous productions are figures. By the heuristic of my research group, "A figure is a figure is a figure" (e.g. Harris & Di Marco, 2017, 2018). That is, if a piece of language fits the structural definition of a figure (as 12 does, of Lanham's definition for *epanaphora*), irrespective of external considerations (in particular, intentionality), it is an instance of that figure. Example 12 also satisfies a basic requirement of all rhetorical figures, "the detected alteration of degree zero" (Groupe μ, 1981, p. 37), standing out as a salient linguistic configuration against the ground of mundane, entrenched speech conventions theoretically reduced to a hypothetical degree of absolute blandness[13]).

What this means, of course, is that rhetorical schemes can be indices, symptoms, of psychological states—perhaps of fatigue or distraction when 'normal' people make such errors, and cognitive decline when pathologies are involved. But the more crucial fact here, whatever we choose to do with definitions, is that 12 indicates

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[12] This poem has a curious citation history. I encountered it in Petrescu, MacFarlane, & Ranzijn (2014, p. 211), with very ambiguous sourcing. I later discovered the fuller sourcing in a fascinating editorial by its author, Kate Swaffer (2016), who gave the source as Swaffer (2012), though without pagination (and I have not been able to consult it directly).

[13] The Groupe μ rubric does not generally present a challenge to schemes, as we have seen, since entrenched (*rolly-polly*) and accidental (*poet / don't-know-it*) schemes still register as deviations at some perceptible level. But there is some challenge in entrenched—though perhaps not accidental—tropes, along the leg-of-a-table and spend-a-weekend line. With 'dormant' tropes, the cognitive motivation behind their coinage has wholly atrophied, so that they appear entirely arbitrary, just another symbol. For my money, however, we can just extend the degree-zero notion historically back to their coinage. While this approach probably makes all words tropes, except for very rare instances like Murray Gell-Mann's invention of *quark* (and even that seems to have some metonymic explanation in his unconscious). I'm OK with that.

that repetition triggers a neurocognitive bias which is functionally correlated with cognitive resilience, and that linguistic 'boundaries' are locations of significant figural activity. Example 12, in short, tells us not only something about the speaker but also about the speech, about rhetorical figuration.

And 13? Is Kate Swaffer's poem full of *epanaphora*? This certainly seems an easier question to answer. It satisfies the two conditions we just rehearsed for 12: it fits the definition and stands out from a ground of prosaic speech. It also has a higher degree of artfulness and design, so it presents none of the intentionality complications of 12. One can certainly wonder, though, to what extent those *epanaphora* are also diagnostic. The theme clearly signals Swaffer's concern with a loss of Self, the most terrifying fear of those who suffer from dementia, until the loss becomes so great that even the nature of that fear dissolves. The overall form signals the trajectory of the disease, from rendering the daily management of material relations difficult, losing objects, to the dissolution of Self, as the reifications set in over the last four lines (the last three lines, as well, can be taken as an *incrementum*).

But the *epanaphora* may also signal the type of repetitive behaviour that characterizes much dementia, returning again and again to rummage idly in the cutlery drawer, for instance, and perhaps the cognitive gravity that beginning-landmarks have. I am not suggesting that Kate Swaffer has not crafted the poem for artistic (and pathotic) effects. Rather, I am asking to what degree her attraction to beginnings and repetitions might be dementia-related.

On the interaction or treatment front, figures are already a very common feature of clinicians and care-giver's speech, where the intention is clear. Lexical repetitions, in particular, are a very common feature of dementia care-giver speech—as, in fact, they are in infant care-giver speech. In both cases, they aid the memory and understanding of the hearer.

6. Conclusion

A more honest title for this paper might be, "A few hopeful speculations about dementia, rhetorical schemes, and cognitive resilience"—and all blessings on *Poroi* for providing a forum for this kind of incipient theorizing.

One has to start somewhere, and I am confident in the evidence that the neurocognitive biases which shape rhetorical schemes can also contribute to our understanding of, perhaps even our diagnosis of, and certainly our treatment of, dementias. The cognitive resilience of rhetorical figures, their redundancy against the noise of distraction, attentional ebbs, and the decline of memory, are all relevant to how we converse with, and listen to, cognitively impaired people.

I have not really served up anything that would count as a research program, but I have done a couple of important, preliminary things, following through on the even more preliminary suggestions of my 2013 *Poroi* article. I have claimed, with evidence and argumentation, that rhetorical schemes are a function of linguistic domains and neurocognitive biases. I have claimed, with evidence and argumentation, that these biases contribute to the cognitive resilience and cultural robustness of figural instances, like proverbs and clichés. And I have observed that such instances show their cognitive resilience in the way their frequency increases in the speech of people with dementia.

And I have claimed, with evidence and argumentation (last *epanaphora* of the paper; I promise), that rhetorical schemes might serve diagnostic purposes for cognitive conditions and syndromes. My hope is that I have also interested you in exploring the ways in which rhetoric might contribute to dementia studies, and ultimately to helping the lives it afflicts.

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