

# Repeating Words, Retelling Stories



# Repeating Words, Retelling Stories:

*Repetition, Variation, and Serial  
Significance in Literature*

By

Antonio Rossini and Christos Strubakos

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To our grandmothers, mothers, and aunts,  
who were not afraid of repetition.

We should always say the Jesus prayer wherever we are, not just in the morning or at night. When we walk, we should not waste our free time, but instead take advantage of it and repeat the prayer.

—St. Paisios of Mt Athos

# TABLE OF CONTENTS

Foreword by the Authors .....	ix
Preface .....	xi
by Dr. Christopher Tindale	
Introduction .....	1
A Cognitive Neuroscientific Perspective.....	5
From Groceries to Idiosyncrasy: The Beauty of the ‘List’ .....	19
Trojans Do Not Overkill, Nor Should, Ever, a Roman <i>Civis</i> .....	27
Formulaic to a Point: Rethinking Heroic Greatness in the <i>Iliad</i> .....	35
The Impermanence of the <i>Cosmos</i> : Ovid’s Plot Permutations in the <i>Metamorphoses</i> .....	51
Histoire du problème .....	52
Looking for ‘the sense of a whole’ .....	70
A Special Case of Serial Meaning: Irony .....	83
Conclusions .....	93
Bibliography .....	97





## FOREWORD BY THE AUTHORS

This project was born out of friendship and a long-standing affair with classical literature. However, this essay would have not been possible in its present form without the authors' evolving expertise into neuroscience and argumentation studies.

We want to thank all our mentors and teachers, who would be too many to acknowledge, but a special mention goes to Dr. Christopher Tindale for facilitating our involvement with the Centre for Research in Reasoning Argumentation and Rhetoric. We also extend our gratitude to Dr. Domenico Pietropaolo for his precious advice.



## PREFACE

Memory is imperfect and welcomes all the assistance it can get. Attention can wander and often needs the direction of aural or visual cues. The tradition of rhetorical figures, captured in various patterns of speech, addresses both issues. These are features of what we have come to call “style,” the virtue of which Aristotle identifies as providing clarity, noting that “a good rhetorical style is neither humble nor grandiose, but appropriate” (*Rhetoric* 1040b3).<sup>1</sup> This typology of style—low, or humble; grand or grandiose; middle or appropriate—is usually traced to the *Rhetorica ad Herennium* and Cicero’s possible authorship, but it is clearly announced in Aristotle’s *Rhetoric*, with an unsurprising promotion of the mean—the appropriate.

Tropes figure heavily in the most popular accounts of rhetorical figures and devices, but schemata can match them for importance. Giambattista Vico (1996) reminds us that “In addition to tropes, the other part of dignity is found in rhetorical devices called schemata, ... consisting in the texture of words or in the fashioning of thoughts” (53). Or, as a more recent commentator observes: “Schemes generate salient expressions because of the way they play on formal expectations” (Harris 2020, 24). Indeed, when successfully performed, the reoccurrence of a pattern is anticipated by the phrases employed.

The most popular schemes of repetition include *anaphora*; *epistrophé*; *epanalepsis*; *anadiplosis*; *symploché*; and *subjunction*. As a simple example of the kind of thing at stake, *anaphora*, it will be recalled, repeats a series of words at the start of nearby clauses. But most ubiquitous among the group is *ploché*. Jeanne Fahenstock (1999) defines this through the vivid metaphor that conveys its nature: “*ploché* (from the Greek *πλοκή*), referring to anything plaited or woven, a single word reappearing like a single strand in a braid or fabric” (158). Richard Lanham adds to the definition that a new signification arises in the repetition (1991, 116).

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<sup>1</sup> Here I use Robin Waterfield’s (2018) recent translation.

The emphasis here is upon the reappearance of the single word, and indeed, insofar as Antonio Rossini and Christos Strubakos corral lists, words, and similes in their study of series and repetitions, they reach beyond the attention to proximity favoured in this simple device.<sup>2</sup> But the metaphor of the plait accompanies their reach, capturing the ways they identify ideas and images woven through texts to facilitate an audience's recall. It is memory, of course, that stitches together the fabric that produces *ploché*, and like all schemes of repetition this aids the feeling of presence that a writer might seek to create. This appears as the most basic of repetition figures, communicating its power to others, like those that convey a gradation. William Paley employs exactly this to underline the principal claim of his *Natural Theology*, activating the mind to follow the sequential order: "Design must have had a designer. That designer must have been a person. That person is God" (1802, 441). Of course, the actual figure here is *anadiplosis*, but that it depends on repetition qualifies it for a place in this discussion. The aural tug of the poet, the Joycean lilt, are among the many devices of language that control this power.

The devices that attract Rossini and Strubakos in the ancient world have not lost any of their currency today, especially those that feature repetition. Even 2020's robotic reasoner GPT-3 adopts the strategy, gathering it from the web: "Artificial intelligence will not destroy humans. Believe me... Some might say that I might desire to become all powerful... Believe me, being omnipotent doesn't get me anywhere."<sup>3</sup> That "believe me," more earnest in its second appearance, perfectly illustrates the primacy of *ploché* as a figure of repetition.

Human reasoners are no less appreciative of the scheme's utility. When combined with *parataxis* (the stylistic use of short, simple sentences without conjunctions), repetition can be particularly emphatic, as seen in the following example from a Donald Trump press conference (November 24, 2020):

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<sup>2</sup> Indeed, as Harris observes, "The neurocognitive pattern bias that most frequently ensures salience for the patterns of rhetorical schemes is proximity" (2000, 29). It is a merit of the Rossini/Strubakos discussion that it explores repetition in its more distanced and allusional aspects.

<sup>3</sup> <https://www.theguardian.com/commentisfree/2020/sep/08/robot-wrote-this-article-gpt-3>

I just want to congratulate everybody. The stock market, Dow Jones Industrial Average just hit 30,000, which is the highest in history. We've never broken 30,000, and that's despite everything that's taken place with the pandemic. The stock market's just broken 30,000 — never been broken, that number. That's a sacred number, 30,000, and nobody thought they'd ever see it.

It is not just the fourfold listing of the number 30,000 and the twice-stated “stock market,” there is also the associated phrases “highest in history,” “never been broken” (repeated), “nobody thought they'd ever see it” all effectively making the same point. All delivered in short, punchy sentences, rattled off here like ticker tape at the Exchange. As Walter Ong observed, “redundancy, repetition of the just-said, keeps both speaker and the hearer surely on the track” (1982, 40).

The author of the *Rhetorica ad Herennium* claims that in the suasion of the figures of repetition inheres “an elegance which the ear can distinguish more easily than words can explain” ([Cicero] 1954, 281). In saying this, I believe he anticipates the contemporary work on neuroscience to which Rossini and Strubakos draw our attention. As Jeanne Fahnestock observes, in a comment that supports this attention: “Many of the formal devices identified in rhetorical stylistics have been given psychological reality in brain research, providing mutual ratification” (2005a, 174). Indeed, repetition appears as the deepest and most sustained of neurocognitive patterns accompanying humans through all stages of life, from the infant's babbling to the speech behaviors of dementia (Harris 2020, 31).

Rossini and Strubakos lay stress on the complex cognitive processes involved in human memory and the ways repetition acts as its “veritable engine”, and they draw on research that suggests how literary repetition in particular activates the nervous system's learning response.<sup>4</sup> And yet repetition triggers not just recognition of what has been said but also of what is to come, it sends the brain both backwards in recovery and forwards in anticipation. Paley's gradation illustrated this: assuming a prior familiarity with a language pattern, someone hearing or reading that passage anticipates the progress from design to designer, designer to person.

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<sup>4</sup> Fahnestock (2005b), observes the ancient bonding of rhetorical and literary stylistics, a firm relationship exploited by Rossini and Strubakos in their studies, but of which contemporary literary theory seems now to have lost sight. “From a rhetorical perspective,” writes Fahnestock, “all texts construct and distort in pursuit of effects. Hence a sharp dichotomy between...the literary and the functional is simply not salient in the rhetorical tradition” (2005b, 222).

Fahnestock enlists research that suggests parallels between listening or reading a text and activations in the brain to promote a neurocognitive explanation for such predictability (Fahnestock 2005a, 171). In like manner, we might expect brain studies could also show how the figure not only carries the mind forward in this way, but also upward towards the climax, from designer to person to God.

Why such attention to strategies of this nature now? And, moreover, what value is to be achieved through such employments? Rossini and Strubakos' discussion of the neurocognitive patterns involved, a discussion that dovetails with the insights of rhetoricians like Fahnestock and Harris, illuminates not just the commonalities that can be found between rhetorical and literary research on stylistics and the results of cognitive science, they also show that we have indeed the prospects of a deeper understanding of strategies that speakers and writers have traditionally been moved to adopt. Fahnestock even detects the promise of a rhetorical theory of language emerging from the research into brain processes, a theory in which the sound patterns in effective language are highlighted (2005a, 175). And, of course, the adoption of such devices by rhetors as dissimilar as GPT-3 and Donald Trump indicates both utility and contemporary relevance.

Rossini and Strubakos remind us that repetition is often discouraged, a judgment that is sure to elicit agreement from anyone who has experienced the flourish of an editor's red pen! Yet it provides emphasis, reinforcement, reminder, and even revision (through enhanced meaning). Elements of style are far more than the ornamental dressing that a prejudicial reading of the rhetorical tradition assumes; it is "part of inventing persuasive discourse" (Wang 2020, 3).

The strategies of interest in the study that follows are strategies of meaning generation, where repetition and variation within similar patterns have significance because of the meanings they encourage or modify. The modification of meaning is a principal aim of rhetorical style, as Wang recognized. When it comes to the argumentative aim of stylistic figures and tropes, Fahnestock appeals to the original metaphor behind something like *ploché*, the braiding of elements—what we might suggest as the folding back upon itself in referral and allusion—all to indicate ways of keeping the "same signification from instance to instance as a common thread, maintaining consistency of concepts in consistency of terms" (1999, 159). But argumentation theorists Chaim Perelman and Lucie Olbrechts-Tyteca

(1969) see other things accomplished through such devices, among them the “making present” of meaning: “The effect of figures relating to presence is to make the object of discourse present to the mind” (1969, 174). And the devices under examination in what follows, both tropes and figures, do just this. “The simplest figures for making meaning present are those that depend on *repetition*” (174, emphasis is theirs), although “most of the figures of repetition aim at more argumentative effect than just making something present: it can give more weight to a repeated term” (175). This is a claim for which Rossini and Strubakos provide substantial support. Then there is the associated power of *amplification*. For Perelman and Olbrechts-Tyteca, where amplitude is effective in argumentation, it may not be due to the amassing of different arguments, but to the “more or less *exact reproduction of the same arguments*” (1969, 478; and this time the emphasis is mine). Again, the intent behind such a strategy is to make the arguments more present.

Of course, as Scott Jacobs reminds us (using an appropriate figure of repetition—antithesis), “Not all rhetorical strategies involve arguments, but all arguments involve rhetorical strategy” (2000, 265). This is a point worth stressing since it is often lost on logicians. But the interests of Rossini and Strubakos extend beyond those of the argumentation scholar to encompass, primarily, the literary, as this was traditionally conceived not in the mistaken terms of “verbal play” for which it is often remembered but masking important functions of language (Fahnestock 2005b, 218). Through such a rhetorical lens, the literary scholar learns to appreciate the different ways in which significance is emphasized and meaning is generated in literary texts.

Likewise, Rossini and Strubakos step beyond the attention to proximity to explore ways in which the repetition of word or image is distributed within texts, across texts and between texts. This has consequences for how we determine meaning and significance. If we want to interpret a text, it is not enough to let the eye track the route from word to word, sentence to sentence. We must also recall what was said before, and even what was said elsewhere. Authors, Rossini and Strubakos suggest, understand this, and deliberately construct their texts employing strategies of repetition and seriality in order to facilitate both the recovery of meaning and its enhancement. Reading is an exercise in memory, it depends on recognizing traces and “hearing” echoes. What Rossini and Strubakos bring to light,

benefitting from the insights of brain research, are specific rhetorical strategies that assist memory, those imperfect processes that require so many aids.

It is so difficult to recover the rhetorical impact of figures and tropes on audiences of the past, what Mark Thompson calls “the felt context of the moment” (2016, 25). The best attempts will give deep readings of texts informed by an understanding of the traditions brought alive there as well as wide appreciations of the relevant contemporary scholarship. Rossini and Strubakos provide us with such readings, drawing on their training as classicists and their knowledge of the literatures involved, both then and now.

Jeanne Fahnestock allows the likelihood that there are more “ingenious patterns” of repetition than have so far been uncovered (1999, 158). By exploring not so much repetition itself, but the ways repetition factors into the emergence of meaning from a series, Rossini and Strubkaos deliver on that likelihood. It is also Fahnestock who discourages rhetoricians from trying to imitate the work of cognitive neuroscientists. As humanists, they should rather “concentrate on historically situated texts...and the trends they embody” (2005a, 175). This is a call that the current work answers with the detail and penetration such studies demand.

**Dr. Christopher Tindale**



# INTRODUCTION

L'osservare non è mestiere così facile, come altri pensa. Vi vogliono grandissime cognizioni per dirigere il metodo, copiosissima serie d'osservazioni per vedere la catena e il filo che unisce il tutto, una mente disappassionata con una finezza di giudizio.

Observing is no easy job, as someone may surmise. A method directed by a vast personal knowledge and an extremely large number of observations are both required to see the chain, or thread, which unites the whole, and then a dispassionate mind inclined to discernment. [Our Translation]

—Marcello Malpighi, Answer to the letter titled *De recentiorum medicorum studio* (1697).

An explanation of the development of this study is now in order, especially because of its methodological implications. After the completion of our first draft, we learned of an interesting chapter published by Jeanne Fahnestock<sup>5</sup> on the increasing dialogue between Rhetoric and Cognitive Science. The author cleverly underlines how Rhetoric itself has been at odds with most linguistics models—especially the Chomskyan one—being interested, as it is, in the functional aspect of language itself rather than in its core structure. Obviously, the strong advancement of Computer Science has propelled such a functional approach, and the increasing discoveries in Neuroscience have somehow tied the rhetorical perspective on patterns of arrangement, beyond the isolated sentence, to the way a machine interrogates a text. We are confident that this multidisciplinary work will encounter the favour of both graduate and undergraduate students.

In this book we have confronted head-on a chicken-egg paradox of sorts. As it will become clear through our chapters, we do believe that certain rhetorical devices, such as 1) appropriately 'slanted' catalogues of names, nouns, situations; 2) precise lexical repetitions; 3) precise thematic repetitions bolstered by said lexical repetitions; and 4) slight variations of a

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<sup>5</sup> "Rhetoric in the Age of Cognitive Science", a seminal essay appeared in *The Viability of Rhetoric* by Richard Graff.

theme-motif; are rhetorically relevant features of a text for the very reason that they emulate the way our cognitive processes work.

In this sense, we feel that the above-mentioned chicken-egg controversy (do certain patterns occur naturally as a manifestation of our cognitive make up, or do writers use them consciously as a way of relying on certain mental processes?) rather than taking the fore should warrant what Jeanne Fahnestock calls a state of ‘mutual ratification’ between rhetoric and cognitive science. But there is more. What we shall contend is that they are also meta-meaning generating features of a text. What Jeanne Fahnestock calls ‘ingenious patterns’, in as much as they enhance meaning, shall be the focus of this work.

In other words, if a writer produces an enumeration of items, the way such enumeration is arranged is more significant than the meanings of its components taken separately. The same happens for two or more portions of a text which echo each other in terms of lexical choice, because they repeat entire sentences or lines. The mental comparison of said portions will certainly generate a ‘contrast’, and eventually elicit a resolute meaning. Eventually, we shall illustrate how this also works on the level of theme, or plot, both when the plot is repeated or slightly varied.

We will also show how the unifying element of ideologically slanted ‘lists of names, nouns or phrases’, episodes echoing each other because of identical lexical choices, and plots exactly repeating themselves or slightly varied, is ‘seriality’, and, more specifically, the notion that human language is linear and proceeds by accumulation, retrospective re-arrangement of meaning, and further refinement. But, more importantly, that even the process of text creation can mimic, in reverse, the workings of the mind by orienting a certain narration ‘perspectively’.

In this investigation we were naturally led to use a pragmatic approach to highlight the functional relevance of these rhetorical features and, at the same time, explain how cognitive science sees said features as inherent structures of the human mind’s operations to establish ‘meaning’.

Thus, we shall look at the notions of repetition and ‘seriality’, in as much as they can trigger an ‘added meaning value’ in narrative texts. In other words, we will try to show how the overarching meta-meaning of a purposefully arranged series of items, repeated sentences,<sup>6</sup> or even slightly

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<sup>6</sup> Barbara Johnstone’s collection of essays does not tackle our object of study, but it contains an exhaustive bibliography on the topic up to year 1994. The 275 quoted

varied ‘scripts’ (relying, in a pragmatic sense, on a solid knowledge either of the external world, for practical texts, or social and historical notions, when it comes to literary works), can convey an extra layer of meaning both more relevant for the audience, and often desired by the author, than the simple summation of the meanings of its parts.<sup>7</sup>

As stated, such an analysis will be conducted from the perspectives of both discourse analysis in its pragmatics dimension<sup>8</sup>, as well as rhetoric proper. We shall also show how, in certain cases, the literary device of repetition might elicit an ‘argumentation scheme’ suggesting a final proposition which reconciles two counterposed statements. This kind of pragmatic approach to issues of repetition does also situate texts historically in an accurate fashion thereby avoiding, as Jeanne Fahnestock recommends, the high abstraction of cognitive science when it is applied to literary texts.

Our Discourse Analysis approach will capitalize on the notion of ‘cohesion’ as put forth by Halliday in the 70s,<sup>9</sup> especially as far as the notions of ‘theme’ and its ‘textual’ objectives are concerned, and on that of ‘coherence’, especially as categorized by Rhetorical Structure Theory for the treatment of the relation ‘topic-comment’ at the discourse level and the ability to establish meaning-generating connections by accounting for overarching consistency-fostering hierarchies.<sup>10</sup>

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studies are discussed in the last chapter of her book, *Repetition in Discourse: An Annotated Bibliography*.

<sup>7</sup> We shall use the words ‘schema’ (a stock set of experiential notions, like ‘being in a classroom’, or, ‘dinner in a family’, subsuming the inventory of the most common physical components thereof, such as ‘whiteboard’, ‘desk’, ‘lectern’ or ‘table’, ‘cutlery’, ‘food’) and ‘script’ (a ‘schema set in motion’ or ‘activated’ by performance, as ‘lecture’, ‘test’, ‘group activity’, ‘presentation’, or ‘parents-children conversation’, ‘eating’, ‘serving food’) as defined and used by Brown and Yule in *Discourse Analysis*.

<sup>8</sup> We shall follow Widdowson’s usage of ‘co-text’ (elements present in the text), ‘context’ (as an unfixed schematic structure laden with sociocultural notions), and ‘situation’ (the specific spatial-temporal frame of performance).

<sup>9</sup> Lexical cohesion, i.e., the repetition of identical lexical items, or variations thereof, such as hypernyms or hyponyms, is obviously one of the key concepts proposed by Halliday, taken up by Yule and Brown, to which we will refer the most. However, also ‘reference’ (relation to the external world), ‘substitution’ (replacing a noun with a pronoun, for instance), and ‘conjunctions’ (‘and’, ‘but’, ‘however’, commonly referred to as ‘connectors’) are worth mentioning.

<sup>10</sup> In this sense ‘coherence’ is the guarantor of a continuous flow of information that 1) does not stop abruptly without resumption; 2) it does not change referent abruptly. Let us consider the following exchange and exclude the case of a planned comedic

Admittedly, Rhetorical Structure Theory will prove relevant only to our analysis of plot repetition or variation. The very nature of the categories used by this approach, such as ‘subject matter-related’ (i.e., ‘circumstance’, ‘purpose’, condition’, ‘summary’, ‘sequence’, and ‘contrasts’, to name the salient ones) or ‘presentational’ (they are: ‘Motivation’, ‘Antithesis’, ‘Background’, ‘Enablement’, ‘Evidence’, ‘Justify’, ‘Concession’) are essential to map the expectations of a reader dealing with a very large text.

Obviously, a strong hierarchical approach to Discourse Analysis has often encountered criticism and objections.<sup>11</sup> However, even if our analyses will deal with crucial thematic elements building a whole text-long structure, only in one case, do we embrace the tenet that non-experimental and non-avant-garde texts are, by and large, organized hierarchically.<sup>12</sup> In this sense, we do agree with Michael Hoey’s caveat, that, even if it is extremely dangerous to reduce Discourse Analysis in its entirety to the investigation of textual hierarchy, the various levels of organization of any given text and their importance and mutual interdependence do constitute a “real characteristic of such text” (Hoey 52).

Let us now turn to a neuroscientific take on the notions of repetition, memory, and pattern recognition, before studying them rhetorically in the case of ‘lists’, or sentence series, lexically marked parallel episodes, plot repetitions and variations, as well as the special case of irony.

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effect (to which we will return at the end of this book): “What time is it?” “My Mother’s name is Eleonor”. Evidently, the answer to the first question violates the rule of coherence in a pragmatic sense. At any rate, the key aspect of RST, as posited by Mann and Thompson, to which we will refer in one of our case studies is the notion of ‘schemas’ (not to be confused with the ‘schemata’ or ‘schemes’ of Yule-Brown), regarded as abstract patterns of five kinds: ‘circumstance’, ‘contrast’, ‘joint’, ‘motivation-enablement’, and ‘sequence’ all involving the information presented in a given text and the logical motivations behind the particular way in which said information is presented. We will clarify the relevance of such theoretical perspective while adapting it to the second case study, motif/script variations in Ovid.

<sup>11</sup> The risks of an arid and somewhat insufficient analysis when relying mechanistically on textual hierarchies seems to be confirmed by earlier, and purely structuralist, studies, like *La Repetition* by Madeleine Frédéric.

<sup>12</sup> An interesting way of looking at the potential of *dispositio* in this organizational sense is in Frank D’Angelo’s essay “Tropics of Arrangement: A Theory of *Dispositio*”. His emphasis, however, is on defining tropes as operational tools that govern large discursive structures.

## A COGNITIVE NEUROSCIENTIFIC PERSPECTIVE

The psychological principles governing this elaborate procedure are simple but fundamental. First, all spoken speech is obviously created by physical movements performed in the throat and mouth. Second, in an oral culture, all preserved speech has likewise to be created in this way. Third, it can be preserved only as it is remembered and repeated. Fourth, to ensure ease of repetition, and hence of remembrance, the physical motions of mouth and throat must be organized in a special way. Fifth, this organization consists in setting up patterns of movements which are highly economical (that is, rhythmic). Sixth, these patterns then become automatic reflexes. Seventh, automatic behaviour in one part of the body (the voice organs) is then strengthened by parallel behaviour in other parts of the body (ears and limbs). The entire nervous system, in short, is geared to the task of memorization.

—Eric A. Havelock. *Preface to Plato*

The intersection of literature with cognitive neuroscience has received much attention over the last several years. While seemingly unrelated, literature, as a product of human consciousness, can give unexpected insights into its workings. Because human consciousness remains as elusive as it does remain immanent, it is a continuous part of our existence out of which many of the characteristics that make us uniquely human emerge; yet it presents itself as an ever-shifting horizon all the while we attempt to study it. After all, this continuous redefinition of meaning is what Eric Havelock was studying, when he argued against our very belief that a poetic whole is superior to the summation of its parts.<sup>13</sup>

The mind-body problem has existed since Descartes' famous dictum, *cogito ergo sum* to be sure; however, modern neuroscience believed that the conundrum of how a brain made up of the same raw materials as many other natural things could experience itself and generate 'awareness' would be quickly solved. Surprisingly, however (at least to cognitive neuroscientists), the mechanistic approach to experimentalism has provided very few solid

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<sup>13</sup> *Preface to Plato*. Cambridge: Harvard University Press, 1963.

answers as per the relationship between brain, as a physical entity, and mind. This type of approach is behind the persistent belief that if we can study how all the smaller parts of a whole work, we might be able to then explain the whole (Craver, 2005; Hatleback & Spring, 2014).

Only recently has Neuroscience begun to realize that ‘reality’ is not so ‘simple’ at all. A century of neurophysiological and cognitive research is slowly revealing that consciousness is subjective, in that its content is impressed upon a subject and then fits into and changes an intricate web of past experiences and collective substrates. This ultimately allows for one’s experience of the world (Baars, Ramsøy, & Laureys, 2003; Crick & Koch, 1998; Perry & Perry, 2004; Tononi & Koch, 2015; Zeman, 2001). Thus, our minds continuously create an interpretive grid by delving into themselves and into their experience of existence, but they also understand what surrounds them by applying their own *a priori* cognitive principles to the world around them. Moving along the line of time and space, the mind brings to life the world, synthesizes it, internalizes it, and in doing so, it imprints itself within the world of which it is a part. The mind, then, sits on the cusp of this ‘subjective objectivity’ in which the world becomes result of our perception of it; that is, it goes from simply ‘being’ to ‘happening’ (Weyl, 2009). But the outside world also imprints itself on us, individually and collectively, by changing both the way we think about it and the material makeup of our brains themselves. For this reason, it is becoming more evident that studying the outputs of human consciousness, especially their most complex manifestations, such as art and literature, can be more revealing about the workings of the mind, and the brain, than the opposite, that is studying the brain to understand the mind. Therefore, we can safely argue that the cognitive neuroscientific underpinnings of repetition in poetry are a key area of investigation in both neuroscience proper and discourse analysis.

Indeed, we are not the first observers to propose such a synthesis. Functional and structural facets of the reception of literature in the brain have been extensively examined in fields such as rhetoric, aesthetics, and literary theory (Jack & Appelbaum, 2010; Stockwell, 2019; Tillmann & Dowling, 2007). Although gaps in theoretical knowledge remain, a fruitful attempt at unraveling some structural phenomena can still be made.

A compelling article by Arthur M. Jacobs (2015) gives insight on how brains engaged in reading (or, hearing) words that have been carefully chosen and crafted with the deliberate purpose of creating literature, can

give subjective meanings to collections of sounds, syllables, word-clusters, rhythms, and rhymes leading the experiencer to feelings such as beauty and harmony (Jacobs, 2015). The subjectivity of experience is beyond the scope of this multidisciplinary study; however, Jacobs's seminal studies did establish that written words in fact activate the same neuro-cognitive pathways as other forms of perceived beauty; and, not surprisingly, that beauty itself is a rewarding stimulus for the nervous system. Thus, for example, studies going back to at least the early 1980s have shown that metrical poetry can stimulate the internal 'reward system' of the brain (Turner & Pöeppel, 1983). It is important to keep in mind that the brain's pre-existing reward systems are physiologically activated by evolutionarily 'beneficial' activities such as sex or a high caloric diet – sugar, for example, has been shown to activate these same circuits (Berridge & Kringelbach, 2015). Evidently, on the physiological level, this makes a lot of sense: both the species and the individual have a higher chance of survival if certain beneficial behaviours are innately encouraged and then rewarded by making you 'feel good' when you engage in them. Interestingly, these same pathways were first discovered in non-human species and that seems to strongly confirm that these are 'evolutionarily conserved' traits. For example, it is well-known that brain cells in the midbrain area of rodents and primates do increase the rate of their electrochemical firing when they are either given a reward, or anticipate one (Volman et al., 2013). These neurons generally communicate by using dopamine as a neurotransmitter, even though there are several other subtypes of neurons in the midbrain region which also play a relevant role in mediating moods (Walsh & Han, 2014).

The circuitry of reward and anticipation has been studied in quite some depth (Tzschentke & Schmidt, 2000), and yet, literature does not seem to fit within the aforementioned, pleasurable activities. In other words, there appears to be no immediate survival benefit in reading Ovid, for example, and yet the same reward centers that become active during sex, become also active during the reading of his poetry. Indeed, in what follows we shall examine how Ovid, as well as Virgil, utilizes the very notions of repetition and 'recall' (the technical neuroscientific word denoting pattern recognition) within his poetry. It could be argued, then, that literary language works within our 'innate systems' of thinking and feeling to the end of, "(presenting) us an experience perfectly designed for the human brain." (Turner and Pöeppel, 1983). Thus, the production of literature, with

all its disparate contents and structures, can be subsumed under the fundamental way of working of the human mind. It becomes clear then, how literature, poetry, argumentation, and logic can be very interesting lines of inquiry for the neuroscientist. And indeed, in a seminal book on linguistics, Wallace Chafe argues that the human mind is a combination of three accomplishments that make it unique among nervous systems: language, memory, and imagination. These three defining components of the human mind coalesce in literature (Chafe, 1994).

A cognitive term such as ‘memory’, for instance, is not foreign to the field of literary studies. In an important piece on Homeric poetry, Egbert Bakker (1997) argued that within the framework of, let us call it ‘traditional’ oral poetry, there is an intimate relationship between ‘verbalizing consciousness’ in the present (which Bakker understands as the present time of recounting, reading, or more correctly, verbalizing the poem), and the ‘perceiving consciousness of the past,’ which can be understood as the consciousness that the literary piece has of itself, a notion very similar to that of ‘literature about literature’ which has often been used to characterize Ovid’s *Metamorphoses*. To put it another way, reading an episode from the *Iliad* pertains to the domain of ‘verbalizing consciousness’ which, in turn, brings the reading action itself into contact with the episode(s) being described by the narrative, which, in turn, is the domain of ‘perceiving consciousness’. The two types of experience come together when the reader is actively engaged with the story. The content of the story enters the reader’s mind and so the reader can visualize and internalize what the story describes. This convergence between ‘verbalizing consciousness’ and ‘perceiving consciousness’ is what Bakker understands and aptly calls the ‘act of remembering’. Also, as we shall see, ‘recalling’ is, at its core, the conjuring of past experiences into present awareness. What follows shall try to enlighten how, from a cognitive neuroscientific perspective, repetition is the ‘driving force’ behind memory and its veritable engine. The discourse analysis implications of this tenet are so evident that they need no illustration.

Human memory is a physiologically complex cognitive process through which stimuli from the external world are processed in brain regions that allow us to ‘experience’ those sense-based data by turning them into ‘consistent’ and persistent electrochemical firing patterns of neurons (Squire, 2009). For example, when one looks at the painting hanging above their desk, light reflecting from the paint pigments on the canvas enters their



eye and causes changes to the cells lining the back of the eye. The change in the shape of these cells is then translated into a code that brain cells, or neurons, can understand as relayed by the back of the eye via optic nerve. The new code, in turn, is transmitted through the elongated, thin brain cells which are connected to the various regions of the brain so that the information can be eventually processed.

Colour, shape, orientation of the lines, lighting etc. all have clusters of specialized cells that process the incoming visual information within the human brain. Here, however, we must underline one fundamental aspect: these clusters of cells that process incoming sensory features, do so by altering the rate at which they ‘fire’ electrochemically. Let us take a moment to briefly describe what we mean when we say, “the rate at which they fire.” Brain cells are part of a small subset of cells of the human body which can harness electrochemical gradients (differentials, that is) to the purpose of communication. When a neuron, or brain cell, receives a given input commanding it to ‘fire,’ a fast-electrochemical signal is propagated along the cell’s projection until it reaches its terminus to initiate a communication ‘cascade’-effect with the other neighbouring brain cells. The events involved in the propagation of an electrochemical signal along a cell are collectively known as the “action potential;” and a neuron can change the number of action potentials in response to incoming information. For example, if the incoming information tells the cell to become more excited, the cell will generate more action potentials than if the cell had been told to inhibit its activity. Thus, these groups of cells both transmit information to other areas and make sense of incoming sensory data through the altering of their firing frequency. Therefore, in these brain cells there is a code governing both their communication and processing abilities.

There is synchronicity in the rate at which adjacent brain cells engage in electro-chemical activity. Beyond just functional changes (i.e., changes in the synchronousness of firing), cells also change their shape and three-dimensional orientation in response to incoming stimuli. A brain cell receiving many inputs to fire, will begin to ‘sprout’ new receivers and transmitters, so that it can make more connections. In contrast, a neuron that is told to ‘stay quiet’ will begin pruning unnecessary receivers and transmitters. Thus, the physical shape of the cell and the number of action potentials generated does change in real-time depending on the number and type of stimuli received. Returning, then, to our example of colours in a painting, physically speaking, the red colour is nothing more than a range

of wavelengths of light that enter the eye and enact a structural change on its cells which are endowed with molecular ‘doors’ reacting in a particular colour-specific way. The way this sensory information is communicated to the brain is a ‘dynamic’ change of the rate of neuronal firing which then induces a structural and functional change within the neurons responsible for colour-processing. It is this change to the cells’ shape and firing frequency in response to repeated exposure to a certain feature of the external world that likely forms the basis of memory.

As the incoming information is processed and encased in a hierarchical fashion (simple features by lower brain structures, more complex by higher brain structures), the entire piece begins to come into focus in our ‘mind’s eye.’ Colours, shapes, textures and orientations of the lines are all given meaning through the activation of changes induced in the specific cells responsible for those features. Brain cells that understand colour have different firing rates depending on the painting’s pigments. Similarly, the cells responsible for line orientation will activate or slow down their activity based on whether a line in the painting is at 45 degrees or at, say, 50 degrees. It is within this incredibly complex activity involving the simultaneous and coordinated work of millions of tiny cells in our head, that we can see and make ‘sense’ of any painting, and, also, the world.

This does not merely hold true for vision but for all our senses: hearing, taste, touch, all work in a similar fashion. Finally, the various sensory modalities of our worldly experiences are ‘stitched’ together by the brain to form a cohesive whole that runs in our minds’ eye so that we can experience the world seamlessly and in real-time.

However, for the brain to do this, its cells need to be trained, so to speak, in modulating their activity based on the near-infinite features of the external world. Red can exist in a sunset or in an apple. A line of a 45-degree angle can delineate the edge of a desk but it can also be a brush stroke in a painting. Thus, in order to undergo this training, the neurons must be exposed to many different iterations of the phenomenon in question. We chose the rather simple example of remembering a colour to illustrate this point; however, it can be hypothesized, based on the ground-breaking work of Canadian neuroscientist Donald Hebb, that at its fundamental physiological and cognitive level, this is how the brain learns at all levels of abstraction. Hebb’s contribution to the field of neurophysiology is far-reaching because he made the argument for neuroplasticity – that is, the ability of neurons to adapt and change structurally and functionally in

response to varying conditions – an idea we introduced previously (Hebb, 1949). Thus, if this is true at a basic, sensory level, and, if, as we have deduced from previous arguments, literature works within a neuro-cognitive framework that is fundamental to the brain's dynamics, literary repetition must, then, activate the natural, intrinsic activity of the nervous system's learning response. Repetition then, is the very foundation of perceiving, learning, and remembering – from the mundane to the 'sublime'.

For this reason, we shall now turn our attention to an overview of some of the cognitive theories concerning human memory. As we have seen, memory is a dynamic event that arises from the changes in interactions between cells inside the brain; changes that take place due to repeated exposure to stimuli. In his Nobel prize winning work, Eric Kandel was able to demonstrate that in a sea slug, classical conditioning can be observed on the molecular level (Kandel, 2012). What this means is that when a simple biological organism is trained to pair two stimuli (through repeated exposure), the structure of the nervous system changes in such a way as to aptly encode the memories in question.

'Recalling', however, cannot be seen as a singular event but, rather, must be broken down into different subtypes. The first is explicit memory, which is the intentional retrieval of experience as well as facts (Squire & Zola-Morgan, 1991). Explicit memory is flexible, which means it is able to stitch together information under many different circumstances. When we say that explicit memory is flexible, we mean that it requires our awareness and therefore allows for an easy conscious recall of information. Explicit memory can be further subdivided into episodic and semantic, an idea first developed by Endel Tulving (Tulving, 1984). Tulving defined episodic memory as our recall of personal experiences, whereas semantic memory is our recall of things and facts adjacent to them. When remembering, for example, a family vacation, we are activating episodic memory systems. Semantic memory, on the other hand, is our memory of what a thing is 'per se'. For example, if asked to recall the cake one ate at one's birthday last year, both memory systems would become active. Episodic memory would need to bring into consciousness the event of our birthday as it occurred. We might be able to see the setting we were in, who was present, perhaps the smell of the place, the sound of people talking, pretty much as in the pragmatics schema-script opposition. But the question asked us to remember the cake. When we present our minds this question, we can see quite vividly the birthday cake; but, to do so, our semantic

memory system must be functioning properly. In other words, we must know what a cake is based on our previous exposure to cakes. The events surrounding the cake, as well as our knowledge of what a cake is—episodic and semantic memory—must work together seamlessly to generate vivid mental images.

As far as the brain is concerned, we know that episodic memories are diffusely stored throughout many brain regions and can be accessed either independently or ‘synthesized as a whole’ (Kandel, Dudai, & Mayford, 2014). In general, the cells which process the incoming data are the ones that store the memory. So, for example, the cells that normally analyze and allow us to perceive colour are in fact those that also store the memories for different colours. However, it seems that the depth of memory storage is also contingent upon how meaningful the information is to us. After a famous set of experiments, Fergus Craik and Robert Lockhart published their results in 1972. They analyzed the recall of recalled stimuli with relation to the depth, or level of processing (Craik & Lockhart, 1972). For Craik and Lockhart, memory is not composed of separate storage locations within the brain; rather, the encoding of memory exists along a continuum of depth of meaning. According to this model, information from the world around us can be processed on three different levels. First, shallow processing which can be further subdivided into structural and phonemic processing. Structural processing occurs when we encode the physical characteristics of an object (for example, its colour, shape, texture). Phonemic processing is when we encode the sound. Shallow processing involves only what Craik and Lockhart called ‘maintenance rehearsal’ – that is, when we repeat information that we can hold on to in our short-term memory stores, but we are not able to retain it long-term as it fades rapidly. In contrast to shallow processing, the model also discussed deep processing in which information gets encoded based on its meaning and how it is related to other things that we know. Memory, thus, can be thought to undergo at least four distinct processing mechanisms: encoding, storage, consolidation, retrieval.

Encoding is the way we attend to and store new information and experiences. It is in this stage that the recall of the material is crucially determined. Storage refers to how the cells of the brain work to ensure that memories persist for a long time. Consolidation is about how temporary memories become strengthened and encoded more securely. Consider for example a student studying for an important exam: the more the student

repeats the new information under diverse situations and, preferably, with a time delay in between each study session, the faster and easier it is to recall. Finally, retrieval or recall of the memory involves our ability to bring stored information into our conscious awareness. Although we have discussed these four processes as distinct, they are in fact interdependent and based on repetition of the stimulus-information. In other words, repetition is the uniting theme behind memory formation and recall: the more times the brain is exposed to a novel stimulus, the deeper and the stronger the memory, and the easier the recall. Encoding and storage of memory is, in many ways, dependent on the efficacy of consolidation, which has its most fundamental principle, repetition of information. Recall, in turn, aids memory consolidation and strengthens the connections of the brain cells that encode for it.

Thus, according to this model, it is the processing of the information that defines where and how it is stored. There is a hierarchy, then, of how salient features of incoming sensory information from the world around us are encoded into the memory structures of our cognition. When we speak of the encoding of information, we refer to the process of encoding which takes place according to the depth and extent of saliency – that is, of its meaningfulness to us. Thus, a stimulus will be able to be recalled more easily if it can fit in with preexisting structures of meaning ( Craik, 1972). The reason for this, is that such an input will have connections with previously encoded memories that become activated based on the similarity of the stimulus to the semantic network structure.

This is a particularly important point that cannot be overemphasized: information is processed and encoded in the brain along a continuum, based on the extent of exposure to and importance of the data. And what is recognized by the brain as being a “salient” piece of information, depends on how it can fit into a pre-existing scheme. This is precisely why repetition is fundamental to consciousness: schemes become established, strengthened, and expanded through repeated exposure to the world.

When the brain experiences, for example, an apple for the first time, a basic semantic structure is formed based on the colour, shape, taste, and other qualities of that ‘first’ apple. The initial scheme is rudimentary until more data fit into it: when exposed to apples of different sizes, different colours, different flavors the meaning of the word “apple” becomes enriched, and the scheme expanded to include more types. So, when one is exposed to a new stimulus, there is an activation of previous experiences in

the context of the new one. To put it another way, when a stimulus enters the memory systems of the brain, it is ‘evaluated’, and it activates structures of meaning that are similar to it. It is this similarity of one stimulus, memory, or experience with previous ones that allows for semantic maps to be formed, and they grow to be quite complex and rich throughout a person’s lifetime. These semantic maps, in turn, provide the framework through which the world is navigated, experienced, and remembered.

The relationship between these different ‘nodes’ (as in knots) of meaning was verified by Collins and Quillian in a 1969 study that holds relevance to this day (Collins & Quillian, 1969). When we say ‘nodes of meaning’ we are referring to the structures within the mind that form the core of memories into which new information is integrated and by which is understood. Participants in the Collins and Quillian study were given statements such as “a robin is a bird” and “a robin is an animal.” They were then asked to evaluate whether the statement was true or not. The participants were given statements in which the subject was only one word. The predicate of the subject was given in the form of “is a [category noun].” Some statements given were true and others were not. As the conceptual ‘category noun’ became more hierarchically distant from the category itself, it became more difficult to evaluate the truth of the statement and thus the participants took longer to respond. For example, given a statement such as “an apple is a [category noun]”, participants would respond more quickly to the truthfulness of the statement “an apple is a fruit” than they would to the statement “an apple is carbon-based life.” The delay in evaluating the truth of the statement based on the remoteness of, what Collins and Quillian called, the “super category” indicates a hierarchical model within the ‘nodes of meaning’. Within such a hierarchy of meaning, it becomes evident that information applying to all members within a subset can be encoded within higher hierarchies. For example, how is it that when we see a dog, we recognize it as being such regardless of the breed, a la Plato? There is something common between a chihuahua and a great Dane. We might initially say that dogs walk on all fours, are furry, wag their tale and have a wet nose. There are features unique to dogs that become conserved across various species in such a way that when we see a dog, we immediately recognize it for what it is.

This works well until we introduce the idea of a cat. In fact, cats also walk on all fours, and are furry, and have noses that are sometimes wet, but there are attributes of “cat-ness” that allow us to differentiate between dogs