Arguments in Gradatio, Incrementum and Climax; a Climax Ontology

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Abstract. Climax is a compound rhetorical figure that includes Incrementum and Gradatio; Gradatio, in turn, is a series of Anadiploses. We report on a novel suite of ontologies that describe these figures and their interconnections. With influence ranging from ancient analysts to a particular study by Jeanne Fahnestock we model the figural structure and aspects of argumentation and cognitive affinities. The key structures for the purpose of argumentation are two overlapping ordered *series* that give *support* to *claims* argued by the coalescing figures. Incrementum has a uni-directional series that exhibits a semantic increase whereas Gradatio shows an overlapping series where semantic properties are distributed less evenly. The resultant Climax *comprises* these two constituent figures and produces a complex argument structure where overlapping series generate multiple, reinforcing claims. Our ontologies are developed in the Web Ontology Language (OWL), validated for consistency and published online.

1 INTRODUCTION

The subject of this report is the rhetorical figure of **Climax**. It is a figure long in history and deep in complexity. We describe the history and background of research in this field—both linguistic and computational—and follow that with an outline of our own investigations. The resulting ontology output is available online.[8]

The importance of rhetorical figures for Argumentation generally ([1], [11], [7], [17], [16], [24], [47]) and Computer Argumentation in particular ([12], [13], [20], [27], [25]) is increasingly clear. Whenever we deal with rhetorical figures, however, we cannot overlook the fact that the traditional literature presents considerable challenges. The tradition is a long and multiplex one—multicultural, multilinguistic, multidisciplinary, and multifactorial—full of riches, but also inconsistent and occasionally even contradictory. The terminology can be especially troublesome. We focus on a small cluster of related figures we call **Climax, Gradatio, Anadiplosis, and Incrementum**, names drawn from the tradition but fixed more precisely by the Waterloo Rhetorical Figure Ontology (sketched briefly, at different stages, in [16] and [25]). Climax is the central figure in this project; the other three all occur as independent figures, but when combined they realize the figure Climax. Our research is therefore a contribution to computational argument studied and the study of rhetorical figures, especially their combinatorics. The term Climax has an ancient provenance—from the Greek κλιμαξ (meaning ladder or staircase). Aristotle may reference it, in his defining treatise *Art of Rhetoric*, discussing the "the manner of Epicharmus"—a comedic dramatist known for exaggeration. Aristotle uses the terms *combination* (συντιθεναι) and *building up* (εποικοδομειν, e.g. as in a house). "[C]ombination," he says in this context, "is an exhibition of great superiority and appears to the origin of great things" and notes that "of two things that which is nearer the end proposed is preferable" [1]. But Rhys Roberts, in his popular translation, in fact renders εποικοδομειν as Climax, and the great 19th century Classicist, Edward Meredith Cope, glosses Aristotle's comments on the style of Epicharmus here as "the building up of one phrase upon (επι) another, one rising above another step by step, like the rounds of 'a ladder' (κλιμαξ), or the stages of a building" [11]:1.142.

The term Gradatio is from the Latin for step (*gradus*). It appears in the early handbook erroneously attributed to Cicero, the *Rhetoric ad Herennium*, where Caplan translates it as Climax, and translates the definition as "the figure in which the speaker passes to the following word only after advancing by steps to the preceding one" [10], along with numerous, not fully uniform examples, such as the following:

> I did not conceive this without counselling it; I did not counsel it without myself at once undertaking it; I did not undertake it without completing it; nor did I complete it without winning approval of it. (1)

Some of the examples, though not all, include a semantic incline (a 'ladder'). The author notes that the defining characteristic of Gradatio is "the constant repetition of the preceding word," over phrase or clause breaks, adding that this repetition "carries a certain charm" [10].

The two words, then, are frequently treated as Greek/Latin synonyms. But we can see at least two processes at work, and the Waterloo Rhetorical Figure Ontology definitions isolate these processes. We use *Gradatio* for the step-wise advancement, phrase-to-phrase or clause-to-clause signaled by the repetition across phrase or clause boundaries. We use *Climax* for those cases where this movement 'rises up' as on a ladder, a classic example being:

> The industry of Africanus brought him excellence, his excellence glory, his glory rivals. (2)

Here we see not just the repetition across clause boundaries, but an 'increase,' a semantic 'rising up' with the relevant terms: excellence is surpassed by glory (note, too, that industry is surpassed by

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excellence). But there are two further decompositions we need for full precision of Climax, one lexico-syntactic, the other semantic—respectively, they are the rhetorical figures Anadiplosis and Incrementum.

The term *Anadiplosis* is from the Greek (αναδιπλωσις), meaning 'doubling.' It is defined by Susenbrutos as "when the last word of a previous clause is repeated at the beginning of the following clause," giving examples such as:

> Then follows wondrously beautiful Astyr, Astyr, relying on his steed. [7]:50 (3)

The term *Incrementum* is perhaps the only self-evident one among our figural terms, since English has absorbed it into ordinary language, for quantitative or qualitative increases. The Early Modern rhetorician, Henry Peachum defines it "as is a form of speech, which by degrees . . . we make our saying grow, and increase by an orderly placing of wordes making the latter word alwaies exceede the former in the force of signification," with examples like this:

> Neither silver, gold, nor precious stones might be compared to her vertues. (4)

The distinguishing characteristic of Incrementum is a series of words (three or more) from the same semantic domain, in which each subsequent word in the series increases along some metric (size, beauty, intensity, status, and so on).

As English scholar Michael Ullyot has noted, "[G]radatio's admixture with other figures and tropes makes its edge cases more difficult to detect" [6] and this phenomenon of interweaving figures was a key theme of our research from conception through to implementation; indeed, that is what makes our project so interesting. More precise definitions and further examples follow in the body of our paper, but the relation among our figures is as follows:

- Anadiplosis features repeating elements on either side of a phrase or clause boundary.
- Gradatio is a series of Anadiploses.
- Incrementum is a series of same-domain words in which each subsequent word marks an increase along some semantic scale.
- Climax is an amalgam of Gradatio and Incrementum, such that each word featured in a phrase- or clause-boundary repetition-pair marks an increase along some semantic scale.

We use the word *ontology* (another linguistic import from the Greeks) in two ways. First, simply as a means of describing elements within a domain such as those of rhetorical figures, argumentation and cognition. The second is more formal and necessitates a representation scheme and a framework of formal logic, both within a computational system. We choose the Web Ontology Language (OWL)[9] for its flexibility, freely-available tools and interoperability within the Semantic Web movement [3].

Our research goal is manifold: to elucidate in more detail the structures within the figure of **Climax** and others related to it; to record these structures in a formal way with a clear, controlled output to be used in computational research into rhetoric and natural language of higher order; and finally to delve deeper into the workings of these figures and illuminate aspects that cross over into related fields such as Natural Argumentation and Cognitive Science.

Our implementation of a suite of ontologies came after much deliberation and discussion of the ways in which the various schemes and tropes act and our methods and resultant output are discussed in subsequent sections. So far our implementation is limited to the few figures we have studied closely. Although ultimately intended for automatic figure detection, this is a current future goal and we bear in mind the experience of others in pigeon-holing the works of writers across the ages: "Authors of literary texts take license with the formal conventions of rhetorical figures; their departures from convention are (as we have argued) a hallmark of individual literary style. Our task as human readers is to judge whether the form is a sufficient and necessary condition for the function" [6].

[9] https://www.w3.org/2001/sw/wiki/OWL

2 BACKGROUND

2.1 Rhetorical Figures

The two most common types of rhetorical figures are tropes, which concern meaning, and schemes, which concern form. Tropes, such as Metaphor, Metonymy, or Synecdoche, are based on semantics, whereas Schemes, such as Rhyme, Alliteration, and Anadiplosis, are based on form. Our ontology involves both tropes (Incrementum), schemes (Anadiplosis, Gradatio) and combinations of the two (Climax). Being subsumed by the semantic category for matters of taxonomy, we consider Climax to be a trope. Compared to tropes like Metaphor and Metonymy, the figures in our ontology have not been as thoroughly studied. In her 1996 article [15], Fahnestock develops a place in argumentation for Incrementum and Gradatio. In their manuscript [6], Bradley and Ullyot use regular expressions to find instances of Gradatio.

Anadiplosis is the repetition of the last word or word string of one colon (a clause which is grammatically, but not logically, complete) at the beginning of the subsequent colon ("sleet" in (5)). When multiple Anadiploses occur in succession, this is known as **Gradatio**. Gradatio then is a sequence of Anadiploses. Examples (6) and (7) are instances of Gradatio.

> Snow turned to sleet, sleet to rain. [14]:124 (5)

> Out of joy strength came, strength that was fashioned to bear sorrow; sorrow brought forth joy. [2]:257–258 (6)

> Be secret then, trust not the open air, for air is breath, and breath blown words raise care. [29]:372 (7)

Incrementum—a figure of semantic increase—is often contrasted with another figure, Decrementum, a figure of semantic *decrease*. For the purposes of our ontology, the figures of Incrementum and Decrementum have been combined into Incrementum, as both figures contain a succession of words with scalar, absolute-value increase—whatever the direction of this increase, we argue, depends on one's point of view. (4) is an instance of Incrementum (with "silver", "gold", "precious stones" and "her vertues" increasing semantically); (8) arguably contains a Decrementum and then an Incrementum, but we consider them both Incrementa (with semantic increase or decrease between the pairs of objects, from "proud man" and "Lucifer" to "flowers in medowes" and "stars").

> In dispraise. Thus a proud man is called Lucifer, a drunkard a swine, an angry man mad. In praise. Thus a fair virgin is called an Angel; good musick celestial harmony; and flowers in medowes, stars. [42] (8)

The figure of **Climax** is a Gradatio with semantic increase, where the elements of the Anadiploses of the Gradatio are the same as the elements of the Incrementum. Again, when Gradatio occurs with *Decrementum*, it is often known as *Anti-climax*, but for the purposes of our ontology, we call both these of figures Climax. Examples (9) and (10) are instances of Climax (where in (9), the repeating elements are "hours", "days" and "year"; in (10), the repeating elements are "designer" and "person").

Minutes are hours there, and the hours are days, / Each day's a year, and every year an age. [44] (9)

Design must have had a designer. That designer must have been a person. That person is GOD. [35] (10)

The form of each of these figures is paired with a function that in turn renders each of these figures cognitive. Anadiplosis contains lexical repetition in salient positions (namely colon boundaries). Gradatio contains the same lexical repetition and positioning, as well as succession. Incrementum contains succession and semantic increase. And Climax contains all of these—lexical repetition, positioning, succession, and semantic increase.

Another important characteristic of rhetorical figures is their tendency to occur simultaneously. For example, (9) is an instance of Climax, but also contains Rhyme; (10), also a Climax, contains Polyptoton or a repetition of words with derivational changes ("design" and "designer"). Note that the very definition of Climax has Gradatio and Incrementum occurring simultaneously, and that the definition of Gradatio includes Anadiplosis.

2.2 Argumentation

Argumentation theory "is a rich, interdisciplinary area of research straddling the fields of philosophy, communication studies, linguistics, and psychology" and involves many theoretical constructions such as *Argument*, *Arguer* (or *Proponent*), *Audience*, *Rebuttal*, *Contradiction* etc. [4]. For our models we make use of two key ideas—*Claim* and *Support*. A Claim is a central point in an argument that is being assumed or conveyed by an Arguer. Supports are assumptions that attempt to convince the audience that the Claim is valid.

Despite the fact that, in the modern computational period, "rhetoricians and argumentation scholars have been very slow to catch on to the role of rhetorical figures in argumentation" [25], there are a number of studies which influence this growing field and our project within it.

A major influence on our research is Jeanne Fahnestock's work on Incrementum and Gradatio [15]. Fahnestock covers authoritatively the rhetorical background of these and related figures and then, beginning with Aristotle's *Topics*, expounds on their relation to the making of arguments. Firstly, rhetorical figures can be used to *epitomize* arguments; that is, an argument is often conveniently and memorably summed up in a phrase containing rhetorical figures. This is especially true for Incrementum, which can serve diverse argumentative functions. One key function is the *graded series*—analogous to the "dialectical tradition of arguing from the more or the less". Incrementa can be defined by the way they create a set of related elements that vary over the length of a figure. This can be done to bridge antithetical points (for example, without the use of Incrementum, there is a large conceptual gap between "minutes" and "age" in (9), "design" and "God" in (10), etc.). Most often this variation is uni-directional and, as she says of Kenneth Burke's assessment: "it invites the audience's participation in its construction or completion, a participation that amounts to a kind of identification with the formal device" [15]. A commonality of genus or category must be perceived in the arguer or audience and our ontologies wrap this complexity in the concept of *Idea*. Important also is the ordering by increase or decrease of the common quantity or attribute—which we model in Incrementum as an *Increase* property on the *Idea* entity. This is even more effective in Climax, where the repetition of Gradatio can be used to link the increasing ideas more strongly. Incrementum can also be used to argue that the value of something is greater than another. For example, in (4), "her vertues" is placed after "precious stones", suggesting that "her vertues" are the most valuable of the objects given.

Argued by Aristotle (and Fahnestock) is that the continuity of genus is present "in different degrees" and (after Piaget) predicated on "the ability to draw analogies between members of different categories". The complexity of this seemingly basic cognitive function is currently computationally intractable when we look to examples of Incrementum and Climax.

Gradatio, as compared with Incrementum, has a slightly different argumentative form. Its chief argumentative function is to chart a chain of influence (at its strongest, a chain of causation), as we can see in the example below. Rather than a figure-wide series moving from origin to end point, according to a "teleological principle", Gradatio creates an overlapping, smooth series of steps that doesn't necessarily aim to bring out an end point argument [15]. Instead it either brings together or pushes apart two ends of a conceptual spectrum by virtue of evoking in the audience a continuum or a fragmentation across the series. We can see this in this argument about the importance of large predators to the overall health of an ecosystem:

1. Large predators create carcasses of large prey.
2. Carcasses of large prey add nutrients and humus to the soil.
3. Enriched soil creates lush vegetation.
4. Lush vegetation attracts small herbivores, such as snowshoe hares.
5. Snowshoe hares attract mid-size predators, such as foxes.
6. Foxes displace smaller predators, such as weasels.
7. Displaced weasels become prey for avian predators, such as owls. [43]

We have idealized this argument somewhat, from a 1995 *New York Times* article, and mapped it more tightly to the Gradatio structure than in the original ([16]:109), to show how the Gradatio can chart the chains of influence that might be asserted in argumentation.

The Gradatio form is perhaps most familiar to argumentation scholars in context of informal logic:

A leads to *B*
B leads to *C*
C leads to *D*
D leads to . . .
. . . which leads to HELL.
We don't want to go to HELL
———
Don't take that first step *A*. [43]

The classic form of the slippery slope argument, since it is ostensibly a causal- or influence- chain argument, is the Gradatio. Of course, as we know, most slippery slopes are rarely furnished with a long articulated chain. They often go from *A* straight to HELL, as in this example:

Once a man is permitted on his own authority to kill an innocent person directly, there is no way of stopping the advancement of that wedge. ... Once the exception has been admitted, it is too late; hence, the grave reason why no exception may be

> allowed. That is why euthanasia under any circumstances must be condemned. [23][45]

Douglas Walton calls arguments like these, "compressed slippery slope" arguments ([5]:281f). More frequently, some of the steps are filled in, but we only get a single instance of each alleged causal link (meaning that the Anadiploses are left out), as in:

> Jeff! You know what happens when people take drugs! Pretty soon the caffeine won't be strong enough. Then you will take something stronger. Then, something stronger. Eventually, you will be doing cocaine. Then you'll be a crack addict! [43]

Walton schematizes this structure with what he calls a Sequential Premise, namely: "carrying out A_0 would lead to A_1, which would in turn lead to carrying out A_2, and so forth, through a sequence $A_2,\ldots,A_x,\ldots,A_y,\ldots,A_n$". Among this sequence for slippery slope arguments is a subsequence, he says, manifesting a "gray zone where x and y are indeterminate points" where a loss-of-control premise occurs, and the escalation continues to A_n, the "catastrophic outcome premise," going to HELL. These characteristics are definitional of the basic slippery slope argument ([5]:288).

Whether each step is spelled out, insinuated, or adumbrated, the schematic structure of the argument always follows the $A \rightarrow B, B \rightarrow C, C \rightarrow D$, etc. of the Gradatio. In fact, the "*A* leads to *B*" passage above, is Bradley Harris Dowden's explication of the "Jeff!" passage in his Logical Reasoning textbook.

But there is also a semantic aspect to slippery slope arguments that is not apparent in the $A \rightarrow B, B \rightarrow C, C \rightarrow D$, etc, Gradatio form alone. This semantic aspect can be seen in both the compressed euthanasia argument and the stepwise stronger-drugs argument: a scalar increase. In the euthanasia argument, the increase is presumably in a series of steps from some acceptable life-taking act (A_0) toward arbitrary and heinous acts of murder (A_n). In the stronger-drug argument, the increase is in the strength (and danger) of the drugs, from Red Bull (A_0) to crack (A_n). Dowden suggests this increase with his catastrophic end-term, HELL (A_n), but the defining semantics of a slippery slope are not just the endpoint itself but stepwise increases toward it. In short, the ideal form of the slippery slope argument, fallacious or reasonable, is a Climax.

The association of rhetorical figures and argumentation has been reported in a number of other recent works such as Yuan [49], Mehlenbacher [31], Lawrence et al. [30] and Mitrović et al. [32]. In an editorial by Harris and Di Marco [25], from the same journal, the importance is placed on "Repetition... such a fundamental aspect of neurocognition that we literally could not think without it", and included also is a description of the usage of Antimetabole in various US General Elections where repetition and symmetry take on important argumentative aspects (if you say something enough, it sticks). More generally the case is made that "since arguments are all the products of human minds engaging other human minds", which exhibit "important patterns of commonality", "Figures provide a way to see those patterns of commonality in argumentation".

As recounted by Mitrović et al., "argument schemes... can be seen as historical descendents of Aristotle's *Topics*" [32]. Fahnestock creates the same connection and states, "Arguments... require, first of all, that subjects being ordered by degree seem to belong to the same genus or category, at least in the perception of the arguer and audience" [15]. We have developed this fundamental principle in our work by the inclusion of the ontological entity *Similarity*. Our concept of comparison (a prerequisite for arguers' and audiences' ability to determine genus or category similarity) is enabled by including this ontology class with relationships to other entity classes such as *Idea* or *Token*. *Similarity* has properties that give it a type and an amount so that comparisons can be nuanced and multi-dimensional.

In their 2017 paper Lawrence, Visser and Reed conducted a pilot study into argument mining over a set of rhetorical figures (six schemes and two tropes). Their goal is to "test the established form-function pairings of the figures on quantitative empirical grounds". Pre-annotated texts are "segmented into the constitutive dialogue units and associated propositional units – in the AIF ontology". The Argument Interchange Format (AIF) is an ontology for argument-related concepts representing an argument as a set of nodes in a directed graph [9] and aims to "consolidate the work that has already been done in argumentation mark-up languages and multi-agent systems frameworks" [37]. In our ontologies we create argument-theoretic commonalities with AIF by including concepts for Claim and Support. Developing this connection is an area for future work.

An area of interest that we have not developed is Rhetorical Structure Theory (RST) [46] which incorporates a theory of "semantic organisation of text" [25], but does not focus on rhetorical figures in the sense that our work intends. Overlap between RST and argumentation has been investigated previously ([21]) and we would imagine this could be an area for further ontological research.

2.3 An Ontological Approach

Ontologies are a way of representing and organizing concepts and relationships between them. The largest previous work done in ontologies for rhetorical figures by Mitrović et al. [32] ontologically models many rhetorical figures in Serbian, including Anadiplosis (*palilogija/anadiploza*) and an Incrementum-like figure called "climax" (*amplifikacija*), but Harris et al. [26] explain that it is an intuitive but still "surprisingly novel" field of study.

As explained further by Harris et al ([26]), ontologies are ideal for representing ideas as complex as rhetorical figures, which have specific properties and are often interrelated. Anadiploses, for example, have the property of repeating strings between word boundaries. Multiple occurrences of Anadiploses create Gradatio, so we can say Gradatio *comprises* Anadiploses. When Incrementum and Gradatio occur together, we have Climax; hence, Climax *comprises* Incrementum and Gradatio. Furthermore, as we saw, rhetorical figures have a tendency to co-occur. In the future, if more figures are to be modelled, they could be more easily combined with other models using an ontological approach.

Because the Climactic Suite can be neatly described with a relatively small group of figures—Anadiplosis, Incrementum, Gradatio, and Climax—it was an ideal suite to model. Previous ontological work has been done on the "Chiastic Suite" of figures, which includes but is not limited to figures such as Antimetabole. This proved to be difficult because, compared to the Climactic Suite, Chiasmi involve more cognitive affinities, have a greater range of rhetorical functions, and involve more complex combinatorics (frequently co-occurring with other figures of repetition and parallelism, as well as with the Trope, Antithesis. Hence, the Climactic Suite offers a relatively isolated group of rhetorical figures to work with as a starting point to modelling other groups of figures in the future.

In effect, ontologies are simply descriptions of related concepts. The process of modelling a concept like a rhetorical figure itself is a large part of the ontology; with each property and relationship, we make a deliberate choice regarding the concepts we model. Furthermore, ontologies are the stepping stone to automating the detection of rhetorical figures; they can reason about the objects they represent, as we will see later in the discussion of our ontology.

We deliberately underspecify our ontology. The variation in patterns of figures in real text means that, as we attempt to specify and hone the elements and properties we find, instances of figures cease to conform to the model. We also do not describe constraints and property characteristics such as symmetry, reflexivity and cardinality. For the purposes of clarity in this report we wish to maintain a high-level view of the entities and relationships, however we recognise that further specification of these details will be necessary in order to improve the efficiency of inference in light of assumptions such as the Open World Assumption.

3 METHOD

We began with a bottom-up approach, starting with the simplest figure, Anadiplosis. Note that this is somewhat different from the bottom-up approach used to model Antimetabole in Harris et al. [26], in that we begin with the figure, whereas they began with instances of (multiple) figures. Instead of looking at the figures present within an instance, we focused on the syntactic constituents of each instance. We began with a single instance of Anadiplosis and annotated it, resulting in a list of constituents that we needed to be able to capture in our representation: words or groups of words, positions, cola, passages, equality relations, and part-of relations. From this, we modelled Anadiplosis, then Gradatio and Incrementum in parallel, before modelling the compound figure, Climax.

We refined many of these concepts, such as changing "sentence" to "clause" to "bag" to "colon"; "sentence" and "clause" were too restrictive, but "bag" appeared too vague and non-standard. We struggled with defining a word's proximity to a colon boundary, as often the words making up an Anadiplosis do not occur precisely at the ends and beginnings of cola. Furthermore, we introduced the concept of "tokens" to the model, which represent the words or groups of words repeating across boundaries, the epitomizing elements of an Anadiplosis. Since we hoped that our ontology could be used to perform automated detection in the future, it was important that we demarcate the defining characteristics of each figure, even if these characteristics may be obvious for human annotators.

We also considered a cognitive model of Anadiplosis, which uses concepts and ideas rather than words and tokens. Although we abandoned this idea because it runs counter to a rhetorician's definition of the figure, we borrowed from it the concepts of "closing" and "opening" tokens. We say that tokens can "close" a colon or "open" a colon, implying their positions relative to colon boundaries but that they may not be the only words in that position.

Modelling Incrementum and Climax came with difficulties as well. Incrementum, unlike Anadiplosis and Gradatio, is a semantic figure, and semantic figures are trickier to represent than syntactic ones. We debated over whether the epitomizing elements of an Incrementum were the semantically increasing words or the *ideas* behind those words. In the end, we decided it was indeed the ideas, since words can be replaced with synonyms but still make up an Incrementum, as one would expect in the definition of a trope. We also discussed the nuances of the semantic change, and whether this change should be represented as its own class (i.e. as class Gradient) with properties or as a relationship between ideas. It was at this stage that we also considered Incrementum and Decrementum to be the same figure. We decided on representing semantic increase as a relation, not only because it was simpler but because relations allow for properties that are true of semantic increase, such as transitivity (e.g. if C semantically increases from B, and B semantically increases from A, then C semantically increases from A). Furthermore, we modelled Climax as the intersection of Gradatio and Incrementum, when the epitomizing elements of Gradatio and those of Incrementum are the same. This makes sense because, by definition, a Climax must have an Incrementum, must have a Gradatio, and only occurs when these figures overlap.

4 ONTOLOGY

Our research brings forth a set of novel ontologies of the rhetorical figures described previously. The primary focus is on the form of constituent elements, but the main purpose of developing these ontologies is to provide a structural reference for future analyses, including computational approaches and to generate greater understanding of the subject figures by the process of ontological analysis itself.

Harris et al. [26] describe the RhetFig project that has analysed the figure Antimetabole for the composition of an OWL ontology. The authors describe the various approaches to modelling a complex linguistic structure such as Antimetabole. Their analysis calls the conceptual elements involved in rhetorical figures Cognitive Affinities such as CONTRAST, SIMILARITY, SEQUENCE, REPETITION and POSITION. Antimetabole, by their analysis, utilizes the affinities of REPETITION, SEQUENCE and CONTRAST. Research into the ontology representations of the cognitive aspects of rhetorical figures is a growing field [26] [34].

An important aspect of our models is that they describe the domain accurately for as many examples of a particular figure as possible. Evaluating that there are very few exception figures that cannot conform to our models is important. However, we recognize that the attribution of figures to real text can be subjective and so not all figures that are labeled as Anadiplosis, Gradatio, Incrementum or Climax will validate in their form and function to our model. We accept this and will take these exception cases as future work to validate that our model is accurate.

An important goal with ontology engineering in the domain of language analysis is to be able to share and re-use the work of others. By publishing ontologies and knowledge bases to the internet we hope to encourage others both inside and outside of academia to benefit from agreed definitions for shared concepts. Our ontologies are represented in OWL (Ontology Web Language) and therefore useful for integration into the Semantic Web or other computational applications that can utilise XML representations.

Evaluating our approach takes a number of forms; we consider both the output and the process. The process of analysis has brought new understanding and shone a light on new pathways of discovery yet to be followed. The ontology as an output is evaluated in section 5.2 of this paper. Future work includes using the ontologies in action for computational processing.

We now take each figure in turn to describe its elements and then summarize the combined model.

The top level entity in our models is Passage. We take this to mean any span of written words that can range in size from an entire book to a simple sentence. The allocation of a figure within a passage is a subjective operation, especially in the case of tropes which are more dependent on semantics than linguistic surface structure.

4.1 Anadiplosis

The central entities involved in the figure of Anadiplosis are the Closing-Token and Opening-Token (both sub-classes of Token) that are related by a Similarity measurement (with type and amount recorded by the of-type and of-amount properties respectively) that are located in Adjacent Cola and therefore repeat across a grammatical boundary closely proximated. The Closing Token appears in the closing section of the initial colon and the Opening Token appears in the opening section of the second colon. This naming is perhaps unintuitive, but reflects the location of the Token in line with its role across the cola. We choose to model the repeating entity as a Token rather than the more usual Word because of our assumption that Anadiplosis can act across elements that are not simply words, e.g. phrases. By abstracting the thing that repeats into a Token we can then ascribe any particular individual item in a text to that class of thing.

Anadiplosis is not characterised only by words that are identical, but can be reflected in a repetition of words in different inflections. Therefore the similarity measurement captures orthographic differences where a property is shared.

We model the concept of a boundary by including the class of Colon, an instance of which must be adjacent to and Precedes another instance of Colon. Where these two cola are next to one another and contain Tokens that are similar we can say that Anadiplosis is evoked. We introduce the concept of Idea in the Anadiplosis model. This is a vague concept aimed at capturing something subjective about the thing(s) that evokes it. We might imagine a concept space driven by the Arguer and populated by intended and unintended ideas from which the audience may or may not conceive. Each Anadiplosis Token evokes the same idea.

Our model for Anadiplosis is shown in Figure 1.

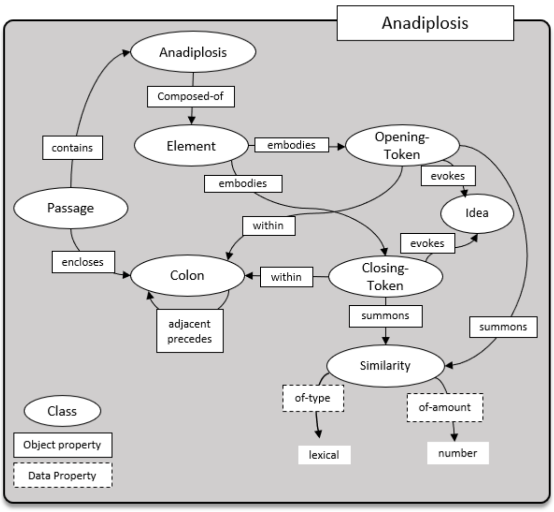

Figure 1. Our model for the scheme of Anadiplosis

4.2 Gradatio

The figure of Gradatio is in essence simply a repetition of a number of instances of Anadiplosis. Here we introduce the idea of proximity through the object property of proximal. One or more instances of the class of Anadiplosis can be proximal to another instance of the same class. This is a subjective measure (we describe problems and future work in relation to this later in this paper). A Passage contains an instance of Gradatio which comprises more than one instance of Anadiplosis that are Proximal to one another.

In this ontology we also reflect the Similarity between adjacent Anadiploses which acts in concert with the intra-similarity in each Anadiplosis which can have the effect of "spanning a conceptual gap" [15].

In the Gradatio ontology we introduce the concepts of Series-Position, Series, Claim and support. We model each instance of Anadiplosis as having a position in the series (either Initial, Mid or Final) and joining a Series which, in concert, supports a Claim.

Our model for Gradatio is shown in Figure 2.

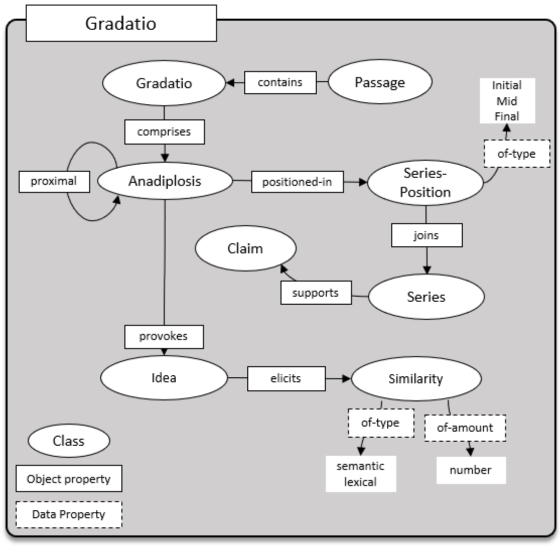

Figure 2. Our model for the trope of Gradatio

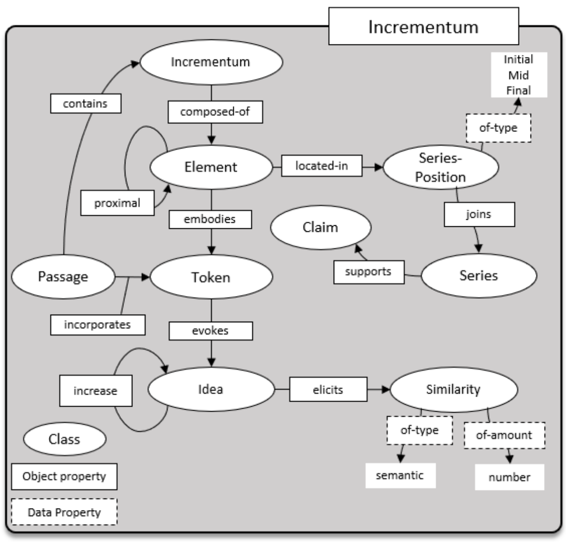

Figure 3. Our model for the trope of Incrementum

4.3 Incrementum

The Incrementum model makes use of the Idea class again. This is our method of capturing the particular facet of semantic content—the variation of which over a Passage can be said to be Incrementum (or Decrementum). We say that an instance of a Token evokes an instance of an Idea that has a similarity relationship to another instance of an Idea in the same Passage and where this exists that Incrementum exists too.

We also model the concepts of a Series in support of a Claim. In Incrementum a directed graded series is created, the elements in which are located in either Initial or Mid position and the Final position being the effective end-point all of which drive the Claim via a supports property.

Our model for Incrementum is shown in Figure 3.

4.4 Climax

Our final model is for the figure of Climax. This is modelled as a combination of the previously-described figures. We say that when Gradatio Comprises Anadiploses with Elements that are the same Elements as those with which an instance of Incrementum has a Composed-of relationship, an instance of Climax is evoked and is contained in the Passage. The argumentation aspects of Climax (beyond those already described for the sub figures) are not modeled yet as these are more complex to elucidate. It is an area of future work for us to develop this.

Our model for Climax is shown in Figure 4.

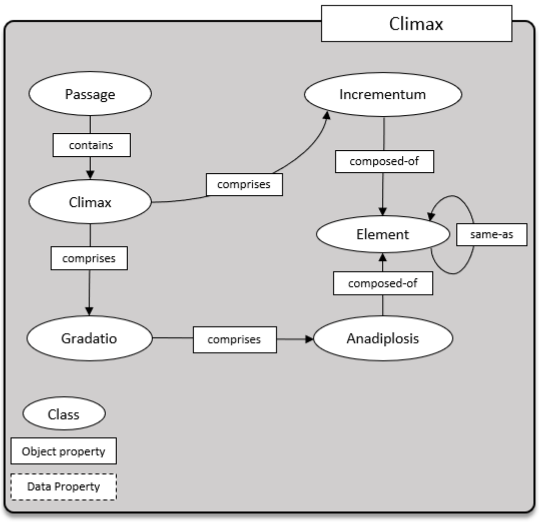

Figure 4. Our model for the trope of Climax

5 IMPLEMENTATION

The ontology was implemented in OWL using the Protégé editor [33]. The implemented OWL ontology captures the concepts denoted in the figures from previous sections using a set of axioms in terms of classes, object and datatype properties, and individuals (instances). The axioms can be represented using RDF triples in the form of (Subject, Property, Object). For example, the axiom that represents the fact "a figure is composed of an element" can be denoted as the triple `(Figure, composedOf, Element)` where **Figure** and **Element** are classes and **composedOf** is an object property from the ontology. In other words, the domain and range of the property composedOf are the classes Figure and Element respectively. For readability purpose, the first appearance of each class and property name is represented using boldface text where class names are capitalized. Individuals and RDF triples are represented using teletype text, e.g., `passage1`.

5.1 Example

We use the following passage as an example to demonstrate our ontology.

> Design must have had a designer. That designer must have been a person. That person is GOD. [35] (10)

The components in this passage are labelled as instances of classes **Passage**, **Colon** and **Token**. The RDF triple `(passage1, rdf:type, Passage)` states that the instance `passage1` is an instance of the class Passage where the property `rdf:type` indicates the instanceOf relation [8]. The selection of constructed instances and their relations are listed in *Appendix1*.

As denoted by *Appendix1*, the sample passage consists of instances representing each colon and token that appeared in the passage. A token is a word or phrase that occurs in a figure and **evokes** some idea. For example, the two appearances of "designer" are represented by the individuals `t1` and `t2` where both are instances of the class Token. That is, tokens `t1` and `t2` both have a string value "designer" and **evoke** an instance `idea1` of the class **Idea**. The similarity between the tokens is captured by the instance `sim1` of class **Similarity**. Tokens `t3` and `t4` have value "person" and both evoke `idea2` and **summons** the instance `sim2` of class Similarity. Token `t5` has the value "God" and evokes `idea3`. Furthermore, `t1` and `t3` are instances of **ClosingToken**, `t2` and `t4` are instances of **OpeningToken** which are subclasses of the class Token. A closing token appears near the end of a colon which "closes" the colon. Similarly, an opening token is placed near the beginning of the colon which "opens" the colon. Therefore the figure Anadiplosis is characterized by instances of ClosingToken and OpeningToken where the tokens refer to the same word as demonstrated by `t1` and `t2`. The repetitions created by the words "designer" and "person" created two instances of the class **Anadiplosis** in the sample passage. These instances of Anadiplosis are represented by the instances `anadiplosis1` and `anadiplosis2` which are connected to instances `ana_element1` and `ana_element2` of the class **ElementOfAnadiplosis**, which in turn **embodies** individuals of `t1` through `t4` which are instances of the class Tokens that represent the words "designer" and "person" respectively.

Gradatio is a figure consisting of two anadiploses, and is represented by the individual `gradatio1` which is an instance of the class **Gradatio** that is connected with `anadiplosis1` and `anadiplosis2` via the property comprises. The instance `anadiplosis1` and `anadiplosis2` are connected to instances of class **Series-Position** named `ana_sp1` and `ana_sp2` via the property **positioned-in**, which **joins** together to form a series represented by an instance `series1` of the class **Series** which **supports** an instance `claim1` of the class **Claim**. Each pair of Anadiploses **provoke** a common Similarity instance that has a **type** and **amount**. This similarity reflects the fractured continuation across the whole Gradatio, identified by Fahnestock [15].

An Incrementum is characterized by the semantic increase that exists among the words "designer", "person", and "God". An instance of **Incrementum** named `incrementum1` was used to represent this rhetorical figure which is linked to three elements of Incrementum (i.e., `inc_element1`, `inc_element2`, and `inc_element3`) via the property composedOf. Each element embodies tokens `t1` to `t5` representing the words "designer", "person", and "God" where each token evokes a certain idea which is represented by the instances `idea1`, `idea2`, `idea3` respectively. As shown in *Appendix1*, `idea3` is linked to `idea2` which in turn links to `idea1` via the property **increases**. The instances of elements of Incrementum are also connected by the properties **proximal** and **precedes** which denote the proximation and ordering of the tokens embodied by the elements. Similar to the instances of class Anadiplosis discussed above, the elements (i.e., `inc_element1`, `inc_element2`, and `inc_element3`) of the instance `incrementum1` are connected to instances of class Series-Position named `inc_sp1`, `inc_sp2`, and `inc_sp3` respectively via the property **located-in**, which are connected to an instance `series2` of the class Series via property joins. The instance `series2` uses the property supports to link to an instance `claim2` of the class Claim.

The individuals discussed are representations of four rhetorical figures within the sample passage, i.e., two Anadiploses (`anadiplosis1, anadiplosis2`) which forms one Gradatio (`gradatio1`) and an Incrementum (`incrementum1`). The figures Gradatio and Incrementum form the last rhetorical figure which is a Climax represented by the individual `climax1` which is an instance of the class **Climax**. This instance is connected to `gradatio1` and `incrementum1` via the property **comprises**. A property called **same-as** that linked `inc_element1` and `ana_element1` indicates that these figure elements embody tokens with the same idea. Therefore it is the same tokens that repeat in Anadiplosis which also possess semantic increase in the Incrementa which in turn form the Climax. The instances `inc_element2` and `ana_element2` are connected in a similar manner. With all components within the sample passage represented using OWL instances, it is now possible to infer relations among each token, colon, and rhetorical figures within the passage.

5.2 Validation and Evaluation

The implemented OWL ontology and instances constructed are validated to be logically consistent by the HermiT 1.3.8 reasoner [39]. We evaluate the implemented OWL ontology and sample instances by following the methodologies for ontology evaluation discussed by Gruninger and Fox [22], where a set of competency questions were developed as requirements for the ontology. The implemented ontology must be able to represent concepts and relations within the competency questions and infer the results [19]. Our ontology was evaluated by answering the following competency questions:

1. List all cola.
2. List all tokens.
3. What are the tokens related to figure X?
4. Does figure X consist of other rhetorical figures?
5. Display the semantic increase that formed Incrementum X.

The competency questions were then translated into SPARQL queries [36] where results can be retrieved from the example instances developed in the previous section. Note that prefix namespaces are omitted to increase readability.

1. List all cola.

```
SELECT ?x WHERE { ?x rdf:type Colon }
```

Table 1. List all cola result

?x
colon1
colon2
colon3

This query simply retrieves all instances of the class Colon.

2. List all tokens.

```
SELECT ?x WHERE {
   {?x rdf:type Token} UNION
   {?x rdf:type ?c.
   ?c rdfs:subClassOf Token}}
```

Table 2. List all tokens result

?x
token1
token2
token3
token4
token5

Similarly, this query simply retrieves all instances of the class Token. This includes instances of OpeningToken and ClosingToken which are subclasses of Token.

3. What are the tokens related to figure X

```
SELECT ?y WHERE {
   ?x rdf:type ?a.
   ?a rdfs:subClassOf Figure.
   ?x composedOf ?e.
   ?e rdf:type ?b.
   ?b rdfs:subClassOf Element.
   ?e embodies ?y.
   {?y rdf:type Token.} UNION
   {?y rdf:type ?c.
   ?c rdfs:subClassOf Token.}}
```

Table 3. Tokens related to figure x result

?x	?y
anadiplosis1	token1
anadiplosis1	token2
anadiplosis2	token3
anadiplosis2	token4
incrementum1	token1
incrementum1	token2
incrementum1	token3
incrementum1	token4
incrementum1	token5

This query returns all instances that are related to an instance `?x` of the class Figure. Specifically, it returns instances of Element and Token linked by the properties composedOf and embodies respectively. We can replace the variable `?x` with a specific figure such as `anadiplosis1` in which only `token1` and `token2` are returned.

4. Does figure X consist of other rhetorical figures?

```
SELECT ?x ?y
   WHERE {
      ?x rdf:type ?a.
      ?a rdfs:subClassOf Figure.
      ?x comprises ?y.
      ?y rdf:type ?b.
      ?b rdfs:subClassOf Figure.}
```

Table 4. Does figure x consists of other figures result

?x	?y
gradatio1	anadiplosis1
gradatio1	anadiplosis2
climax1	incrementum1
climax1	gradatio1

This query returns all instances of Figure connected by the property comprises. If we replace the variable `?x` by a specific instance of Figure, e.g. `climax1`, then the query returns all instances of Figure that `climax1` comprises, i.e., `gratadio1`, `incrementum1`, `anadiplosis1`, and `anadiplosis2`.

5. Display the semantic increase that formed Incrementum X.

```
SELECT ?idea ?increasedIdea
   WHERE {
         ?x rdf:type Incrementum.
         ?x composedOf ?e.
         ?e rdf:type ElementOfIncrementum.
         ?e embodies ?y.
         ?y rdf:type ?c.
         ?c rdfs:subClassOf Token.
         ?y evokes ?idea.
         ?idea increases ?increasedIdea.}
```

Table 5. Semantic increase in Incrementum x result

?idea	?increasedIdea
idea3	idea2
idea2	idea1

An Incrementum is linked to an element which embodies some tokens that evoke an idea. This query first finds instances of Idea that are related to the instances of Token connected to the Incrementum `?x`. Then the query evaluates the property increases between the instances of Idea and returns the result. We can replace the variable `?x` with a specific instance of the class Incrementum, e.g., `incrementum1`, which yields the same result.

6 CONCLUSION

Our project has several goals. One is to elucidate structure to the understanding of Anadiplosis, Gradatio, Incrementum and Climax. We attempt this through the analysis and development of an ontology suite. We model the fine detail of each figure and consistently apply it to real-world examples of figures. This part of our project was successful, but until we extend the reach of our ontology output and include rhetoricians and users from other backgrounds we cannot be sure that either the descriptions are sensible or that the model is coherent for all the diverse variations in figures to which the descriptions are yet to be applied. The ontology is modeled and developed in OWL which enables us to utilize the power of logical inference and validation with tools such as Protégé. It also enables significant reuse within the Semantic Web movement and by publishing the files ontologies online we enable others to benefit from our work.

We hold to the idea that ontology engineering often brings benefits both in terms of the eventual output (e.g. as an XML representation to be shared and utilised), but also for the process itself of analysing a particular domain. This has been a theme of the work in analysing rhetorical schemes where significant insights have arisen from ontologically-driven knowledge engineering. This is not the only goal, however, and we aspire to take all ontologies forward into computer models that do a number of different tasks from describing, quantifying, discovering and elucidating what is a fascinating and important domain of artificial intelligence research.

The suite of ontologies contains an individual model for each figure that are combined into a single OWL file. Care was taken to name classes and properties so that no overlap would occur. Many hours were spent discussing the various aspects of the figures and issues that were raised include the idea of proximity in language and how to model this. Obviously any figure must have elements that are in some way aligned closely to each other, usually in the same sentence or group of clauses. To express this in a formal, flexible and constrained way was too difficult given the wide variety of examples in existence. We settle on the concept of Proximal which evades the issue somewhat, but captures the essence. For automated categorization of figures we are aware that this issue will need to be addressed for computational purposes and that a variation in word distance or equivalent would be suitable for defining this.

Our main influence was Fahnestock's analysis from 1996 [15] in which she discusses the argumentation aspects of Gradatio and Incrementum. Considering them as series-formative structures with variation in the direction and fragmentation of the perceived semantic properties gives us enough to build models where we merge the surface features with underlying properties of meaning (which is ultimately why we are studying rhetorical figures). Going further we relate the elements in the sequence, from their sequence positions, to the support they give to the claim that the figures are making towards an audience.

We hope that by encoding these entities in relation to these important rhetorical figures we can provide some benefits to computational rhetoric especially in the area of argumentation analysis. The burgeoning field of argument mining is another area where, because of connections we have included to some basic concepts of argument theory, some benefits can be drawn out in support of applications that highlight automatically argument schemes and supporting claims.

In parallel to the benefits to computational applications, we share our findings into the inner workings of these figures. Through our abstraction and aggregation process coupled with testing against real-world examples of each figure, we are confident that our model is accurate, however this is yet to be tested on a large set of figures.

7 FUTURE WORK

The initial goals of our project have been achieved and we are continuing with our analyses and intending to put our output to computational use in various areas such as figure detection, but we also highlight many areas on which we would like to work in the future and list them below with descriptions of the purpose and context.

1. The current state-of-the-art technologies for classification employ Machine Learning techniques, including Neural Networks, which require much data for training. One possible effective way to acquire this data is through a Gamesourcing project, which would considerably speed up populating our database, increasing the training precision on the task of automated rhetorical figure recognition by gathering the players to annotate new rhetorical figure examples upon a rewarding system offered by the Game.
2. In addition, the level of proximity (Proximal) of a Token to a Colon boundary may strengthen or weaken the presence of a rhetorical figure, such as Anadiplosis, or even invalidate its occurrence; another example to consider is the Proximal value for more than one instance of Anadiplosis, to compose a Gradatio. Therefore, several ways of measuring proximity using both true positives and negatives about the presence of a given rhetorical figure must be evaluated, ranging from word count distance to semantic distance, this latter referring to how much (maybe subjectively) the rhetoric figure effect is affected.
3. Another important metric that must be investigated is the level of semantic similarity between words, Tokens or Ideas. This metric is important to automatically detect increasing Ideas; for example, such as those that must occur in Incrementum, e.g. the words "person", "designer" and "God" invoke ideas that have semantic similarity concerning the notion of agency, but this is difficult to define precisely and an open problem in AI.
4. The Argument Interchange Format ontology is an established consolidating tool for conceptualizing argument structures. Our work creates only minimal linkage to this area via the concepts of Claim and Support, but we believe that there is room for growth to both *Information Nodes* (relating to argument content and representing claims) and *Scheme Nodes* (domain-independent patterns of reasoning) [9]. We envisage more associations being drawn out here and perhaps the development of an extension to AIF.
5. A clear goal for future work on these ontologies is to extend the conceptualizations of the argument structures so far outlined. We only model the surface features of an argument (Claims, and Support) yet there is a wealth of other elements that could be brought into the support structures behind these features. For example, the premise that Climax is a figure built up from Incrementum and Gradatio seems well established. However, the argument structures at play—a contrasting set of uni-directional graded series (Incrementum) and overlapping staggered series (Gradatio)—can be thought of as developing an even more complex combined argument that could be modelled. We also mentioned Rhetorical Structure Theory previously and another interesting area to develop would be to extend our work by including references to RST's elements similar to Mitrović et al [32]. Anadiploses may be key figures involved in Coherence Relations such as Elaboration, Circumstance, and Background, for instance, and the trope Antithesis is surely related to the relation Antithesis.
6. In many of our project meetings the go-to activity was to draw up the ontology in question on the board designed deliberately to help each of us understand what was going on in the ontology—to create a visual argument for the proposals. Visualizations in argument is an existing area of research ([5] [40] [41]), but we believe that the interplay of visual elements from the perspective of ontologies of rhetorical arguments is a novel area for research. A graded series that develops an argument applies both to words and images and is used in the example given by Fahnestock when she discusses Gradatio—George Gaylord Simpson's "Horses: The Story of the Horse Family in the Modern Worlds and through Sixty Million Years of History" [15]. Similarly the famous image of the March of Progress (from Howell [28]) shows a uni-directional graded series with a clear enough argument behind it [41]. We believe this is an interesting area to explore further.
7. Consistency-checking for data that comply with our ontology is also important in later research. This requires an automated process to determine whether instances constructed are consistent with each other. For example, if a passage contains a figure, then the tokens embodied by the figure should be within the same passage. A consistency checker was implemented by Wang and Fox [48] for city performance indicators represented using ontologies [18] where similar approach could be adopted for our Climax ontology.
8. Lastly, we want to expand the ontology analysis to include the cognitive aspects of these figures tackled on this research. When we perceive the patterns we describe as Climax, our brains do pre-determined tasks that can be put under the banners of Cognitive Affinities (like Repetition, Symmetry, Balance and Scale) and Image Schemata ([26] [34]). These are driven by neurological structures (not yet understood) that manifest as types of understanding/cognitive processing of input. Though we have touched on this a little, it has been far from comprehensive, and has left this opportunity for further inquiry. The benefits of this work would be a greater understanding of how the figures actually work "under the hood" so to speak and would increase our abilities to develop computational approaches to the management of figures for example, in text, but also to peek behind the curtain of how our brains work and thereby contribute to cognitive science in general. Rohrer [38] discusses experimental studies that connect the sensorimotor cortex to linguistic expression and Metaphor.

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Appendix 1—Figural Instances example

Table 6. Passage Instances

Instance Name	Property	Object
passage1	rdf:type	Passage
passage1	hasValue	Design must have had a designer. That designer must have been a person. That person is God.

Table 7. Figural Instances

Instance Name	Property	Object
passage1	contains	anadiplosis1
passage1	contains	anadiplosis2
passage1	contains	gradatio1
passage1	contains	incrementum1
passage1	contains	climax1
passage1	encloses	c1
passage1	encloses	c2
passage1	encloses	c3
c1	rdf:type	Colon
c1	hasValue	Design must have had a designer.
c1	precedes	c2
c2	rdf:type	Colon
c2	hasValue	That designer must have been a person.
c2	precedes	c3
c3	rdf:type	Colon
c3	hasValue	That person is God.
t1	rdf:type	ClosingToken
t1	hasValue	designer
t1	within	c1
t1	evokes	idea1
t2	rdf:type	OpenToken
t2	within	c2
t2	hasValue	designer
t2	evokes	idea1
t3	rdf:type	ClosingToken
t3	hasValue	person
t3	within	c2
t3	evokes	idea2
t4	rdf:type	OpenToken
t4	hasValue	person
t4	within	c3
t4	evokes	idea2
idea1	rdf:type	Idea
idea2	rdf:type	Idea
sim1	rdf:type	Similarity
sim2	rdf:type	Similarity
t1	summons	sim1
t2	summons	sim1
t3	summons	sim2
t4	summons	sim2
sim1	of-type	lexical
sim1	of-amount	1.0
sim2	of-type	lexical
sim2	of-amount	1.0
anadiplosis1	rdf:type	Anadiplosis
anadiplosis1	composedOf	ana_element1
anadiplosis2	rdf:type	Anadiplosis
anadiplosis2	composedOf	ana_element2
ana_element1	rdf:type	ElementOfAnadiplosis
ana_element1	embodies	t1

Table 8. Figural Instances (cont.)

Instance Name	Property	Object
ana_element1	embodies	t2
ana_element2	rdf:type	ElementOfAnadiplosis
ana_element2	embodies	t3
ana_element2	embodies	t4
gradatio1	rdf:type	Gradatio
gradatio1	comprises	anadiplosis1
gradatio1	comprises	anadiplosis2
anadiplosis1	proximal	anadiplosis2
idea3	rdf:type	Idea
idea4	rdf:type	Idea
anadiplosis1	provokes idea3	
anadiplosis2	provokes idea3	
sim3	rdf:type	Similarity
idea3	elicits	sim3
idea4	elicits	sim3
sim3	of-type	semantic
sim3	of-amount	0.5
seriespos1	red:type	Series-Position
seriespos2	red:type	Series-Position
anadiplosis1	positioned-in	seriespos1
anadiplosis2	positioned-in	seriespos2
seriespos1	of-type	Initial
seriespos2	of-type	Final
series1	rdf:type Series	
seriespos1	joins	series1
seriespos2	joins	series1
series1	supports	claim1
claim1	rdf:type	Claim
incrementum1	rdf:type	Incrementum
incrementum1	rdf:type	Incrementum
incrementum1	composedOf	inc_element1
incrementum1	composedOf	inc_element2
incrementum1	composedOf	inc_element3
inc_element1	rdf:type	ElementOfIncrementum
inc_element1	embodies	t1
inc_element1	embodies	t2
inc_element1	proximal	inc_element2
inc_element1	precedes	inc_element2
inc_element1	same-as	ana_element1
inc_element2	rdf:type	ElementOfIncrementum
inc_element2	embodies	t3
inc_element2	embodies	t4
inc_element2	proximal	inc_element3
inc_element2	precedes	inc_element3
inc_element2	same-as	ana_element2
t5	rdf:type	Token
t5	hasValue	God
t5	within	c3
t5	evokes	idea5
inc_element3	rdf:type	ElementOfIncrementum
inc_element3	embodies	t5
sim4	rdf:type	Similarity
sim5	rdf:type	Similarity
idea5	elicits	sim4
climax1	rdf:type	Climax
climax1	comprises	gradatio1
climax1	comprises	incrementum1