

Hierarchical Organization in Writing, Poetry and Mathematics

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Abstract

The appreciation of complex works in several disciplines can be facilitated by outlines: e.g., the outline in writing, the outline in poetry reading, the theme-development-theme-conclusion form in symphonic music, and the use of primary periods in Fourier analysis. However, outlines are a primary, level-1, organizational feature. In this paper, we explore use of secondary and tertiary organizational structure in writing, poetry reading and photograph storage.

1.1. Overview. While several disciplines routinely use outline methods to create, compose, read and/or appreciate complex works, the use of secondary and tertiary organizational methods is less known and less applied. In this paper, we explore uses of primary, secondary and tertiary organizational structure in the arts and mathematics: in writing prose, reading poetry and storing photographs.

1.2. Writing Prose. A good outline typically precedes the writing of any complex work. But an outline is a level-1, primary, organizational method. The power of using level-2 and level-3 – secondary and tertiary – outline methods to improve writing is less known and not always consistently applied. The Grahams developed a powerful writing system based on primary, secondary and tertiary outline methods.

Here is a brief description of the Graham approach [1]: (i) The primary, level-1, outline is developed in Microsoft Power Point using the *outline* vs. the *slides* tab; each row of the outline is placed in the title of a distinct slide. (ii) Each outline row is then developed with a secondary outline of bullets in the corresponding slide. (iii) The simultaneous use of the *outline* tab as well as *slides* tab allows quick review, rearrangement and rewriting of the outline structure via simple mouse drags in the *outline* tab. (iv) Because the sentences of the essay are not yet present, it is fairly straightforward to critically examine the development of each outline theme presented in the individual slides. Rearrangements and rewrites of secondary development structure can then easily be accomplished with cuts and pastes. (v) Once satisfied with the primary and secondary outlines, the written work is completed by supplying the level-3, tertiary, level of organization, – the actual essay sentences – which are linked to the developmental bullets in each outline theme slide. The Graham approach has been extremely successful.

1.2. Reading Poetry – Overview. Reading naturally complements writing. Consequently, remarks about the organizational structure of writing naturally transfer to reading, albeit with some exceptions. To illustrate our points we use the Psalms as presented in the JPS translation [2]. We chose the Psalms because they contain multiple styles. Several points about poetry reading can be made.

1.3. Level-1 Poetry. Certain Psalms – e.g., Psalm 145 and Psalm 119 – are Hebrew acrostics. The Psalm is organized alphabetically with each Hebrew letter corresponding to a fixed number of verses beginning with that letter. Such a Psalm exclusively has a primary, level-1 outline; it does not have further secondary and tertiary outlines.

1.4. Level-123 Poetry. The JPS bible does use level-1, primary outlines in the translation of several

Psalms; JPS indicates these outlines using paragraph formatting. In this paper, we explore use of secondary and tertiary outlines to read poetry. To illustrate our approach, we use Psalm 1 (Figure 1):

1. *Prosperous is the man who does not walk in the counsel of the wicked, nor stands in the way of sinners, nor sits in the seat of the scorers.*
2. *But whose delight is in the Torah of the Lord; and in his Torah, he meditates day and night.*
3. *And he shall be like a tree planted by the rivers of water, that brings forth its fruit in its season; its leaf also shall not wither; and whatever he does shall succeed.*
4. *The wicked are not so; but are like the chaff which the wind drives away.*
5. *Therefore the wicked shall not stand in the judgment, nor the sinners in the congregation of the righteous.*
6. *For the Lord knows the way of the righteous: but the way of the wicked will perish.*

Figure 1: Psalm 1. The body of the paper presents the level-1 outline and its further development.

- **Level-1 outline:** The primary, level-1 outline of the entire Psalm is found in verse 6 (v. 6): (I) *The Lord knows the way of the righteous*; (II) *the way of the wicked will perish*.
- **Key outline phrases:** The key phrases in part (I) of the outline in verse 6 are *the Lord knows* and *the ways of the righteous*. Let us now develop these phrases at a secondary and tertiary level.
- **The ways of the righteous:** At a secondary level the phrase *the righteous* is developed using the phrases *who does not* [do evil] (v. 1) and *whose delight is in the Torah* (v. 2). At a tertiary level the phrase *who does not* [do evil] is further developed using the phrases *who does not walk in the counsel of the wicked, nor stands in the way of sinners, nor sits in the seat of the scorers* (v. 1).
- **The Lord knows:** At a secondary level *The Lord knows* is developed using *prosperous* (v. 1), *whatever he does shall succeed* (v. 3) and *he shall be like a tree* (v. 3). At a tertiary level the phrase *like a tree* is further developed by the phrases *like a tree planted by the rivers of water, that brings forth its fruit in its season; its leaf also shall not wither* (v. 3).

Part II of the outline – *the ways of the wicked will perish* (v. 6) – can similarly be developed at a secondary and tertiary level. We suggest that secondary and tertiary development can enrich poetic reading just as they have enriched the writing of prose, as shown in section 1.2.

1.5. Photograph Compression. Electronic photographs are stored using principles of primary, secondary and tertiary outlines. Unfortunately, the mathematics – Fourier analysis - is extremely technical and consequently there is no good nonprofessional summary. A good collection of several references with many applications is [3]. The basic idea can be illustrated with the graphical form of letters of the alphabet: e.g., the O, P, and D are level-1 approximations to the Q, R and B respectively. Fourier analysis teaches how to approximate any figure using primary, secondary, tertiary and further curves. The picture is electronically stored by retaining the initial approximations of the picture and “forgetting” excessively detailed ones. Although technically, Fourier analysis only applies to infinite periodic phenomena, operationally it is applied to finite, non-periodic items like photographs.

References

- [1] D. Graham and J. Graham, *The Writing System*. Preview Press, 2002.
- [2] Orlinsky, Speiser and Ginsberg eds., *The Jewish Bible: Tanakh: The Holy Scriptures – The New JPS Translation According to the Traditional Hebrew Text*, Jewish Publication Society, 1985.
- [3] N. Saito, <http://www.math.ucdavis.edu/~saito/courses/Fourier/books.html>, Webpage on Fourier books.