1) Recently there has been a great deal of talk within literary studies about surface and depth, under the sign of “surface reading,” a constellation of emerging methodologies united in their rejection of “symptomatic reading.”

2) Because “symptomatic reading” is seen as rooted primarily in a psychoanalytic tradition, this turn to surfaces has been routinely linked the emergence of a new theory of the unconscious. Today, I want to suggest another area within cognitive science that bears on methodological questions of surface and depth, namely, contemporary cognitive theory of analogy, where the dominant paradigm of structure-mapping theory has relied on an increasingly contentious distinction between “deep” and “superficial” forms of similarity involved in the processing of analogies.

3) Structure-mapping theory, as its name suggests, defines analogical thought as a procedure that maps the structure of a familiar conceptual domain (called the source) onto another less familiar conceptual domain (called the target) and results in the transfer of inferential knowledge. This theory of analogy has been the career-long interest of cognitive psychologist Dedre Gentner (in coordination with a number of others in the field), though structure mapping is probably more familiar to most as employed in George Lakoff and Mark Johnson’s influential conceptual metaphor theory.1

4) Like all computational approaches to analogy, the structure-mapping approach aims to

---

build computer simulations that model analogical thought in a psychologically plausible manner. In practice, this means developing logical procedures that – provided with two domains -- can, first, identify similarity matches between them and, second, process these similarity relations in a way that allows for meaningful analogical inferences.

5) As formulated by Gentner, structure mapping divides conceptual domains into systems of objects, object-attributes, and relations, and further distinguishes between types of relation based on logical order. These relations are then ranked according to a principle of *systematicity*, which prioritizes higher-order or structural relations as more relevant to analogy making. This hierarchical principle has motivated a distinction between “superficial” and “structural” similarity relations, where *superficial* similarities entail “mere-appearance” matches between domains (e.g. “A sunflower looks like a sun”), shared attributes (“tables and cows have four legs”), and other semantic, associative, or isolated relations; structural relations entail high-order relations such as causation or attraction.

6) Though these basic features have remained more or less constant since Gentner first introduced her theory in the early 80s, certain theoretical commitments have shifted over time to accommodate new empirical research conducted to test the theory. When Gentner first proposed structure-mapping theory, there was hope that it would provide a purely “syntactical” or logical approach to analogy and that simulations like Gentner’s Structure Mapping Engine (SME) might be capable of detecting analogies “without appeal to specific content or appropriateness” (Gentner 1983 165). Over time, however, the prospects for such a syntactic approach diminished as empirical data suggested the fundamental relevance of content and context.
7) The most unexpected finding emerging from the empirical data was the central role of “mere-appearance” and other so-called superficial relations in the construction of analogy in the research lab. In her 1983 essay, Gentner largely dismisses the relevance of so-called superficial similarities: “although [mere appearances] can be appealing and locally useful, their explanatory power is sharply limited,” Gentner writes, “Mere appearances will not concern us further” (161). But this dismissal proved premature. For when Gentner and her research group conducted studies of analogy processing, it became evident that individuals consistently relied on “superficial” similarities instead of structural similarities, revealing a tension in the model’s normative and descriptive aims. Within a decade after Gentner’s initial proposal, the role of mere appearance in “analogy retrieval” became an established tenet of the structure-mapping theory.

8) Despite this discrepancy between theory and experimental data, dubbed the “analogical paradox” by Kevin Dunbar, most cognitive psychologists remain committed to the structure-mapping approach, and there are now a wide range of explanations that attempt to preserve the basic theory from this unanticipated relevance of “superficiality”: some posit psychological constraints that interfere with natural analogical processes: for instance, the heuristics and-bias argument that memory is inherently susceptible to superficial similarity or the computation-based argument that the initial filtering for attributional content makes computation more psychologically plausible or, finally, the adaptationist kind world hypothesis – which suggests that individuals are drawn to irrelevant similarities of appearance on the grounds that, often, things that look the same behave the same. Others have rejected the validity of the laboratory results outright and have seen them to be an effect of the artificial conditions imposed by the laboratory itself.
From this “naturalistic” view, the perceived importance of superficial similarity disappears altogether when individuals are studied in naturalistic settings, where they exhibit the principle of systematicity. None of these various explanations, however, question the normative assumptions of the structure-mapping model itself. All, in some way, code the evident relevance of superficial similarities as a form of misreading – either of individuals or of scientists, more or less felicitous depending on the context.

9) The problem is not that structure-mapping theory makes a distinction between structural and superficial, relevant and irrelevant, features involved in the construction or justification of an analogy. Rather, the trouble is the way that structure-mapping theory assumes that it can specify the nature of this fluid distinction and, more specifically, correlate an analogy’s plausibility not just probabilistically but directly with its level of systematicity (Bartha 71). As Nelson Goodman notes in his essay, “Seven Strictures of Similarity,” similarity fails to yield up a logical structure; similarity judgments always require normative criteria: a “selection of relevant properties” and “a weighting of their relative importance” (“Seven Strictures” 445). The difficulty is that what counts as relevant in a similarity judgment is hardly universal but a function of context and purpose (445).

10) So where does the normative model of structure mapping theory originate? As it happens, Gentner constructs it out of a historical analyses of shifting interpretations of analogy in the Western scientific tradition, what she describes as the “discovery of modern analogy” and the “ascendancy of analogy over metaphor” in scientific practice where metaphor here denotes a “broad category, encompassing analogy [i.e. relational] and mere-appearance similarity matches” (Gentner and Jezierski 452) that includes both early pre-
scientific interpretations of analogies (for example, those practiced in alchemy) as well as many instances of literary metaphor which, for Gentner, fail to qualify as analogy. Moreover, Gentner and her research group have proposed, on several occasions, that individual development recapitulates this basic shift – moving from attributional to relational similarities, thus attesting to a fundamental rationality directing both individual and scientific history.

11) It’s time to get to my literary-critical payoffs, and I’ll start with a few open-ended questions that feel salient in light of the research program I’ve been discussing. First, what are the normative principles by which we evaluate the aptness of literary or poetic analogy, and are they the same as this selective model? More specifically, does the same commitment to systematicity hold; how would an account of literary analogy handle the question of superficial and structural similarity?

12) I have no clear answer to this questions, only a short reading, but my feeling is that an adequate conception of poetic analogy will require a much more comprehensive account of analogy than that offered by Gentner. That account must respect the analogical and cognitive purchase of poetic comparisons; it must not evaluate poetic interpretations of analogy according to selective scientific standards or relegate it to a category with other pre-scientific interpretations of analogy like Gentner’s idiosyncratic category of metaphor does. As Wallace Stevens writes in his essay-lecture “Effects of Analogy,” “we are not thinking here of analogy in this narrow [logical] sense. We are thinking of it as likeness, as resemblance between parallels and yet parallels that are parallels only in the imagination, and we are thinking of it in its relation to poetry. Finally we are thinking of it from the point of view of the effect it produces” (709).
13) Stevens’ essay echoes many of the issues (and phrases) occurring in William Wordsworth’s well-known analysis of poetic comparison in his 1815 *Preface*. Wordsworth’s patently psychological approach to analogy, likewise, resonates in many ways with the current cognitive scientific milieu. In his distinction of imaginative and fanciful comparisons – seen as products of the operations of two distinct but interacting faculties, Imagination and Fancy -- Wordsworth utilizes a similar distinction of “structural” and “superficial” relations: the resemblances identified “when the Imagination frames a comparison” depends on “inherent and internal” instead of “casual and outstanding” properties; Fancy, on the other hand, operates according to laws “as capricious as the accident of things” (636).

14) But, despite his invocation of surface and depth, Wordsworth’s analysis of comparisons formed by the Imagination takes for granted the importance of surface similarity as the occasion for imaginative comparison: imaginative comparisons “take[] advantage of the appearances of the senses” (631) – that is, they capitalize for their cognitive effect on the contingency of sense, viewed as an entry point to the understanding of deeper structural relations; they “endow” objects “with properties that do not inhere in them upon an enticement from properties and qualities the existence of which is inherent and obvious” (632). (Those familiar with the recent work of Mark Turner and Gilles Fauconnier on conceptual blending theory will recognize a similar commitment in Wordsworth to the emergent structure resulting from analogical comparison.)

15) Since my theme here has been surface and depth, I want to spend a little time, finally, interrogating Wordsworth’s sense of what properties of an object or image constitute the *obvious* and the *inherent*. To explain the process of imaginative comparison, Wordsworth
produces several examples from his own poetry. Regarding the line “Over his own sweet voice the Stock-dove broods” (5) from “Resolution and Independence,” Wordsworth offers this comment:

The Stock-Dove is said to coo, a sound well imitating the note of the bird; but, by the intervention of the metaphor broods, the affections are called in by the imagination to assist in marking the manner in which the Bird reiterates and prolongs her soft note, as if herself delighting to listen to it, and participating of a still and quiet satisfaction, like that which may be supposed inseparable from the continuous process of incubation. (633).

16) When I first started reading this line over Wordsworth’s shoulder, I was largely interested in the structural or logical irrelevance of what Wordsworth represents as the similarity match that initiates the poet’s comparison between the dove’s mating call and its process of incubation – i.e. the shared vowel sound between coo and brood that makes brood an equally viable onomatopoeia. But more striking to me now is the curious way brood, indicated by Wordsworth as metaphor, returns so nearly to what we might call its literal semantic domain. It seems very possible to read the line literally – especially if one misses the phrasal use of over as in brood over. The fact that the so-called “figurative” sense somehow calls into question the “eminence of place” of the literal and raises the question: what exactly is the obvious meaning of brood? Wordsworth asserts it is the metaphor that intervenes upon the bird’s note, but surely it’s a two-way street; brood is brought back to its “literal” semantic domain to reinforce, from the warmth of the note coo, an affective dimension which, for Wordsworth, is not accidentally but “supposed” to be “inseparable” from the concept itself.
17) This cognitive purchase of the analogy seems related to Douglas Hofstadter’s recent account of the role of analogy in categorization. At the heart of this interpretation is the claim that mental categories are characterized by fluid boundaries which shift as a result of an incessant process of analogy making – viewed here not as a “high order reasoning mechanism” but a mode of perception – that, by degrees, arrives at the “structural” essence of a mental category. These categorical essences do not exist objectively but emerge in ways that any hard distinction of surface and depth does not adequately capture since new analogical instances can always modify what one perceives as structural. Along these lines, the cognitive purchase of Wordsworth’s analogy is not any new insight or understanding regarding the nature of dove’s song; rather what changes is an interrogation of the concept of brooding itself, a revelation of an affective component of its structure through the “appearance of the senses.”

Works Cited


