

## A Phonology for (almost) Everything: Formology (A synopsis)

Harry van der Hulst

[All references to my own work can be going to the #number next to the references which refer to items under ‘Publications: <https://harry-van-der-hulst.uconn.edu/>’. Other references cited here are provided in the text below. Many other relevant references, among others to related work by others, are fully referenced in my publications.]

Until the early 1990s, my work focused on the phonology of spoken languages. Taking a broader view of phonology, as the study of the perceptible form of human languages, I then extended my work to sign language ‘phonology’ (van der Hulst 1993 [#51]; van der Hulst and van der Kooij 2022 [#169]). Having thus explored a *visual* phonology, I broadened my interests further to include other visual semiotic systems, and, specifically, sequential visual narratives (i.e., ‘comics’, “graphic novels”) and drawings more generally. Feeling uncomfortable with using the term ‘phonology’ for my explorations, I have proposed the term *formology* (adopted in a book on Multimodality by Neil Cohn and Joost Schilperoord, published in 2024), defined as the study of the perceptible *form* of all semiotic systems.

Departing from a linguistic field, I have followed a heuristic methodology that has come to be known as “superlinguistics” which explores the applicability of linguistic concepts to other semiotic systems (including animal communication systems). Doing so one needs to carefully avoid forcing all such systems into the mold that suits spoken and signed languages (which between themselves already display important modality differences, and both, as one might expect, being subject to a rich diversity of theories).

Recognizing the importance of studying diverse semiotic systems, within the same or in different modalities, *in their own right*, my work, starting with my work in the domain of sign phonology, has been guided by the notion of *Structural Analogy* which refers to the possibility (or assumption) that semiotic systems, and even the different modules within such systems are structured in an analogous fashion.

In the study of spoken languages phonologies, much emphasis has been placed on *formal compositionality* which here means that language expressions at their three levels (phonology/formology, syntax and semantics) display (analogous) complex structures that organize finite sets of basic (atomic) units into hierarchical structures. While this kind of compositionality has also been identified for sign languages, in that domain it is clear that the form of expressions (at the phonological/formological and syntactic layer) is subject to the influence of *iconicity* (which also plays a role in spoken languages as has recently come to be more widely recognized). Iconicity counteracts formal, discrete compositionality by causing a more holistic form. Sign languages show us that the apparent ‘conflict’ between formal compositionality and holistic iconicity must be recognized, which is not to say that it is clear how language users integrate both factors in their ‘mental grammars’, as ongoing research reveals.

For me, a logical consequence of working on sign phonology was to explore phonological organization in other semiotic systems. I define phonology as the study of the perceptual form of semiotic systems, irrespective of modality. (I have suggested that a proper term for this endeavor would be *formology*.) The essence of phonology is analyzing the perceptual form in terms of meaningless building blocks (like speech sounds, technically: phonemes and their featural properties) that are organized in larger but still meaningless structures, such as syllables and larger

units. The acknowledgment of a phonological level of analysis establishes *dual patterning*, which has been held to be a defining property of human languages. My general assumption is that all semiotic systems have a dual patterning, and thus a phonology/formology. However, as especially the study of sign languages has shown, the task of phonology must not be limited (as is usually the case) to accounting for the discrete *compositional structure* of perceptible forms. We must broaden our idea of what phonological theories are about to include how *iconicity* shapes the perceptible form of expressions. This means that a complete theory of phonology must comprise two (interacting) submodules: (a) *Compositional phonology* that deals with the discrete, compositional organization of signs in terms of meaningless units and (b) *Iconic phonology* that deals with the analogous mapping from semantic-conceptual structures to phonological forms. While a lot of work has gone into theories of compositional phonology, much less progress has been made in the domain of iconic phonology. Paradoxically, despite the almost exclusive interest in compositional phonology, it is clear that iconic phonology overshadows compositional phonology in the *emergence* of new semiotic signs, especially in the visual modality. When looking for a form to represent a concept, signing people naturally come up with an iconic gesture, which is nevertheless subject to formal principles that may get the ‘upper hand’ over time; see [van der Hulst \(2025 \[#188\]\)](#). The desire to create signs that are iconic, rather than arbitrary, is deeply ingrained in our human nature. At the same time, it is also clear that the human mind is perfectly capable of learning and using arbitrary signs, given the overwhelming arbitrariness of form/meaning relations in words in all human spoken languages. It has long been recognized that iconicity in sign languages plays a far more important role than it does in spoken languages which is simply because it is much easier to ‘be iconic’ in a visual modality. Most things and actions have a visual shape or movement which can easily be represented with a visual gesture. With our hands we can mimic the shape or handling of objects, while movements of the hand add a dimension of action.

Following this path, in van der Hulst (to appear), I provide the outlines of a ‘phonology of drawing’. We might expect that in the visual modality of *drawing* the force of iconicity is also very strong, perhaps even more so, because the point of many kinds of drawing is precisely to represent ‘reality’. However, as we have seen in the study of sign language phonology, establishing a level of analysis that recognizing strictly formal units, and constraints when combining them, is, in my mind, possible. It may seem that trying to locate such a level of analysis in the drawing modality is harder because of the overwhelming force of iconicity, and it has certainly been argued that it is pointless to try and establish a compositional phonology of drawing beyond enumerating a list of elementary units or aspects (such as line, shape, texture, etc.). Nevertheless, there are important precedents of work that establish a formal, non-semantic level of analysis of drawings (and paintings) produced by artist such as Paul Klee (*Pedagogical Sketchbook*, 1925) and Wassily Kandinsky’s (*Punkt und Linie zu Fläche*, 1926) and, especially, in scholarly work by the Belgian group ‘μ’ (*Traité du signe visuel*, 1992) and John Willats’s (*Art and Representation: New Principles in the Analysis of Pictures*, 1997). Following these authors who clearly propose a strictly formal, pre-semantic compositionality of drawing, I take the *point* and *line* to be the basic units (the latter analyzable into a small set of distinctive features). Deliberately using linguistic terms in order to highlight analogies, I regard basic graphic 2-dimensional shapes as analogous to ‘syllables’. Taking a perceptual perspective, it seems that ‘parsing’ a complex shape into parts (appealing to *curvature minima*; Hoffman and Richards 1984) is analogous to parsing speech into syllable-like units based on *sonority minima*. Such ‘rough’ parsings feed into the higher-level, cognitive creation of 3-dimensional representations (involving units such as *geons*; Biederman 1987). Geons are meaningless formal units that enter into combinations that can be provided with

meaning, facilitating *object recognition*. These steps in processing visual perceptual input can be linked to stages in visual perception that are generally recognized in approaches that follow the initial ideas of David Marr (1982). In my work in progress, I discuss various other aspects of the phonology of drawing as we push the approach that works from analogies further.

An important aspect of my model is that we must make a distinction between the mental composition of an (intended) drawing and its actual ‘articulation’, which is analogous to recognizing the level of phonetic implementation in models of spoken phonology. I also discuss the role in my model of various kinds of formal grammars, such as line grammars, shape grammars and graph grammars. Bearing in mind the complete scope of formological theories (compositional and iconic aspects), I try to shed light on the interplay between formal compositionality and iconically-driven holism in the domain of drawing.

Beyond individual drawings and single panels in graphic novels, or cartoons, sequential narratives have structure *above* the panel, namely in the way in which panels are arranged on the page and together make up chunks of the narrative. This aspect of graphic novels can also be analyzed ‘linguistically’; see Cohn (2013 and much other work by the author).