

THREE

Unfolding Interpretations

Graph Interpretation as Abduction

To better understand ‘competent’ reading of unfamiliar graphs, two detailed case studies are presented. ‘Competent’ reading of unfamiliar graph, which involves the process of abduction, shares features with the work of successful detectives, who engage in a dual process: they structure the situation to isolate hypothetical signs and construct hypothetical referents. Through the production of interpretants, which produce a mutual elaboration of sign and referent, the graph reader seeks convergence so that the sign-referent relation is intelligible and plausible. This referent situation is an articulation of the reader’s understanding of the world rather than something that the author of the graph attempted to transmit. All interpretation is therefore already grounded in understanding, which is further articulated and elaborated in the interpretive process. It is shown that, even though the scientists form a relatively homogeneous group, perceptual structures such as intersections or intercepts are not inherently signs and that a sign on a graph such as ‘N’ may have different interpretants.

3.1. ABDUCTION

In ordinary everyday life, words and signs are better understood as useful tools used to attend to the concern at hand rather than to represent the world or an aspect of it. Words and signs are part of the way in which we are attuned to and understand the world, and in this way they are transparent; they are a form of direct relation rather than a (mental) representation of something else. Graphs and graphical features, too, can be transparent, such as when Karen, a water technician, points to a spike in a graph and says, ‘This is a clogged pipe’. She *interprets* the spike as little as she *interprets* the sound that is, according to the International Phonetic Association, phonetically transcribed as ‘[paip]’; rather, the spike is an aspect of a world in which a water pipe on a farm is clogged. (This transparency is the topic of Chapters 5 and 6.) Familiar graphs occasion the making present the totality in which they normally take their part. One could

also say that in such cases, graph reading leaps beyond the material basis of the text to an intimately familiar world. When scientists face an unfamiliar graph, such occasioning cannot occur in principle. But what they may do is find some aspect of their familiar world that could stand in a mutually constitutive and transparent relation with the graph at hand. This requires a two-part process. First, the reader has to perceptually analyze the graph and caption and isolate some features as signs. Second, for the signs and their structural relations, the reader has to hypothesize a situation in the world that could be the equivalent of the graph. As a constraint, the internal structure and dynamic of the graph and caption has to coincide with the structure and dynamic of the intelligible world: Interpretation is a search for coherence. In this case, reading does not leap beyond the material basis of the text but constitutes a protracted process in which the reader moves back and forth between structural analysis and grounding the signs in the familiar world. The analogy of Detective Bertrand developed in Chapter 1 may be helpful in thinking about this interpretive process.

When Detective Bertrand entered the room where Professor Ashmore was found dead, he did not know which aspect would allow him to find the murderer, that is, which material object or constellation constitutes the sign relevant to reconstruct the events. But, by moving between various hypothetical event scenarios and hypothetical signs—the placement of objects in the situation and perhaps various testimonies he already collected—he can construct a scenario and a set of signs that stand in a mutually consistent and constitutive relation. Although he may arrive at some such scenario, there are no guarantees that it corresponds to what ‘really’ happened and he may inculcate the wrong person for the murder. However, his reading is said to be competent when he arrives at an intelligible and reasonable scenario and corresponding set of signs. The situation is not transparent, for Detective Bertrand cannot say what happened at the instant that he walks into a situation. Rather, his process of reading involves a protracted process in which he constructs tentative signs, links these signs into a coherent, self-stabilizing network of significance. He also analyzes signs, discards some perceptual aspects as relevant signs, and seeks new ways of looking at the situation to provide him with clues (signs) to the original event. It is possible that the process and the results of another detective’s work would be different, involving different scenarios and culprits. That is, the situation is like an *open* text (work) read differently by different people. In contrast to the closed text (work), built on known codes and set cause and effect chains, open texts (or works) force readers to make their own interpretation and draw their own conclusions. This process is referred to as creative abduction.

Creative abduction is a synthetic inference whereby a specific sign is explained to be the result of a general rule applied to a specific case. Take the case of the spike in Karen’s graph. A scientist unfamiliar with the graph may never-

theless hypothesize that rapid changes in water levels are due to problems in the water level measuring device (rule). One kind of problem is a clogged outflow pipe that makes the water rise rapidly in the measurement cylinder (case), which would directly entail a spike in the strip chart (result). Seeing the spike as a spike (artifact, non-natural event) rather than as a sign of a natural event then leads to the particular scenario constructed. However, it is clear that other scenarios could be found that are also consistent with the reading of the trace as 'spike'. Although less likely, the rule may be inappropriate in this situation if the water could rapidly rise for some other natural reason.

In more formal terms, creative abduction is the process of finding the in Chapter 1 discussed set of parameters $\{R, S, c, r\}$ that satisfies the relation $R = f_r(S, c)$. Although previous cultural experiences make scientists parse the graph into particular features that serve as signs S , they never exhaust the realm of possible signs nor do they elaborate the signs identified in the same way. The possible contents R are functions of the scientists' experiences and understanding of the world.

The 'competent' readings in my study follow the patterns of creative abduction. When scientists read graphs with which they are not familiar (though these might represent standard fare in the undergraduate training of their own field), their task of interpretation is twofold. First, they have to reconstruct the internal dynamics of the multimodal text. Second, they have to restore to the text the ability to project itself outside in the representation of a world that we can inhabit. This double task constitutes the structuring and grounding components of my semiotic model. Despite the unfamiliarity of a graph, scientists succeed in establishing a web of signification that is intelligible and corresponds to a standard (and therefore 'correct') interpretation. The following case studies show, however, that the outcomes of interpretative process can be quite different. That is, depending on their background and experiences, scientists arrived at different sets $\{R, S, c, r\}$ and interpretant signs that elaborated the relation $R = f_r(S, c)$.

Ultimately, then, confronted with the graphs and captions, scientists asked to make sense of this compound 'text' and to elaborate it in terms of their fundamental and existential understanding that they always and already have available, though frequently not in articulated form. The task occasions this understanding to be articulated in the face of the graph. That is, rather than decoding information, readers unfold their understanding of an intelligible world. At best, therefore, there will be agreement between the author and reader of a graph when the worlds they inhabit are similar to a certain degree.



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