



Journal of Documentation

Information visualization and/as enunciation

Johanna Drucker,

Article information:

To cite this document:

Johanna Drucker, (2017) "Information visualization and/as enunciation", Journal of Documentation,
<https://doi.org/10.1108/JD-01-2017-0004>

Permanent link to this document:

<https://doi.org/10.1108/JD-01-2017-0004>

Downloaded on: 04 October 2017, At: 08:46 (PT)

References: this document contains references to 61 other documents.

To copy this document: permissions@emeraldinsight.com

Access to this document was granted through an Emerald subscription provided by emerald-srm:198529 []

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

*Related content and download information correct at time of download.

Information visualization and/as enunciation

Johanna Drucker

*Department of Information Studies, University of California Los Angeles,
Los Angeles, California, USA*

Information
visualization

Received 4 January 2017
Revised 15 June 2017
Accepted 25 June 2017

Abstract

Purpose – A Recent work in information studies re-engages with theories of subject enunciation first developed in the work of twentieth century structuralist and post-structuralist critics. To date this work has not been extended to the analysis of data visualizations. The purpose of this paper is to assert that information visualizations embody specific dynamics of positionality for which linguist Emile Benveniste's formulation of a speaking and spoken subject provides a critical analytic framework. In particular, enunciative theory can be used to explicitly address the mechanisms of power formation in information graphics "spreadsheets, charts and interfaces" that are frequently seen as mere presentations of quantitative or statistical information. This approach is based on attention to the performative aspects of graphic expression and the ways familiar features such as frontality framing and scale can be read critically.

Design/methodology/approach – A theoretical argument that applies literature in enunciation as developed in linguistics, film theory, and psychoanalysis to information visualizations. The paper makes specific analyses of the graphical features of spreadsheets, common charts and graphs, and interfaces to show how they create speaking and spoken subject positions.

Findings – The theory of enunciation is useful in understanding the ways information representations, particularly visualizations of data, work to produce power relations.

Research limitations/implications – The topic may seem to draw on theoretical positions that are associated with structural and post-structural theory popular three decades ago, but since the study of enunciation was never applied to information visualizations, the work feels timely. Recent work in information studies has re-engaged with these theoretical issues, but not applied them to charts, graphs, and other visual forms. Information visualizations are so prevalent that any critical insight into their operations feels timely, even urgent.

Originality/value – The concept of information as enunciation in recent work in information studies has not been applied to visualizations. Analysis of the production of subject positions as commonly understood in other fields (linguistics, textual studies, film studies, visual studies, and psychoanalysis across a broad range of cultural studies fields) can be usefully applied to information graphics.

Keywords Design, Linguistics, Information visualization, Data, Documents, Data visualization, Enunciation, Theories of the subject

Paper type Conceptual paper

In the 1990s and early 2000s, many constructs from critical theory were incorporated into analysis of information, particularly in the work by Bernd Frohman, Birger Hjørland, and Ronald Day, as well as others somewhat more tangentially related to the field, like Mark Poster (see Frohmann, 1992; Hjørland, 2000; Day, 2005; Poster 1983). Their critical orientations inclined them to the same borrowing of post-structuralism that was ongoing in other social sciences and humanities. More recent work in information studies, particularly that of Day, has brought attention back to the theory of the subject – and to analysis of subjectivity in information systems. In *Indexing It All*, Day explicitly describes the relations of persons to documents in terms of positionality, and all that this implies in terms of power relations and the critical theoretical discourses that address its formation (Day, 2014).

"There isn't any separate Platonic realm of "ideas" apart from their enunciation" (Day, 2014, p. 6). Day's statement could be applied directly to graphical forms of presentation, but, interestingly, very little work has been done to make this connection. An information visualization is not a statement, not simply a presentation of "ideas" any more than any other articulation. Every visualization is an act of direct address (Drucker, 2014)[1].



Journal of Documentation
© Emerald Publishing Limited
0022-0418
DOI 10.1108/JD-01-2017-0004

Therefore, information visualizations (graphic, tabular, numeric, network, complex, interactive) should be situated among those modes of discourse that can be analyzed as enunciations – that is, forms of communication that inscribe speaking and spoken subject positions (Drucker and Svensson, 2016). The idea of enunciation ought to be part of the standard intellectual toolkit for study of information visualizations – and their workings.

With this in mind, this paper addresses the ways graphical expressions enact an enunciative system in which speaking and spoken (graphing and graphed) subject positions are created. By exposing the constructive and constituting features of these graphics, this approach demonstrates the extent to which the apparently neutral, presentational, mode of visualization erases the very markers of power structures by which its ideological apparatus interpellates the subjects of expression. The paper will briefly summarize the state of critical engagement with visualizations, sketch the historical foundation of enunciation, outline its basic principles, and then show how they elucidate information visualizations such as spreadsheets, graphs, diagrams, charts rendered in orthographic and perspectival systems, and graphical user interfaces.

Critical engagement with visualizations

Criticism of information visualizations tends to focus on the values and the ideologies of content, or the biases built into the sites and lifecycle of data production[2]. For example, in his straightforward discussion of the deceptive power of graphics, Calvin E. Schmid paid attention to the ways in which mapping conventions regularly encode misinformation – by using area rather than population, for instance, to represent the geographical distribution of opinions, political beliefs, or other values (Schmid, 1983). In his classic work, *How to Lie with Graphics*, Gerald E. Jones provided one example after another of the (sometimes inadvertent) deceptive properties of graphics (Jones, 1995). Recently, Lena Groeger has called attention to many instances of manipulative information design, and also, to the ways data production (data models and sampling) is obscured by visualization (Groeger, 2017). Standard textbooks on information visualization include lessons on how graphical presentations can fail – either because they are not well-constructed to communicate with the formal features at their disposal, or because they abuse these deliberately or accidentally[3].

In addition, and in complement, in recent years, critical data studies have developed potent insights into the ways in which power, values, and ideology are at work in quantitative methods. Lisa Gitelman, Ted Porter, Rob Kitchen and others have established solid parameters for analysis of data as a constructed cultural expression[4]. These developments focus on the production of data, the biases of algorithms, distortions in the models of data creation lifecycles and ways that quantitative methods produce evidence shaped by arguments. The supposed objectivity of empirical or statistical methods has been thoroughly challenged as a result.

Many of the insights from critical data studies are directly relevant to the analysis of graphical forms. Feminist critiques, such as those of Laura Mandell and Lauren Klein, have produced astute analyses of the content of the graphics and the underlying data models (see Mandell, 2017; D'Ignazio and Klein, 2016). But even their attention focuses on creating and presenting quantitative information, rather than the analysis of the structuring principles of graphics as enunciative expressions that position their makers and receivers in a co-dependent relation of power. By reviving the critical concept of enunciation that was intellectually fashionable several decades ago, its powerful theoretical terms can be brought to bear on the dynamics of communication within information systems.

Formulation of the concept of enunciation

The original formulation of enunciation appeared in 1966, when the linguist Émile Benveniste published an article titled “La Nature des Pronoms” that became enormously

influential (Benveniste, 1966). His arguments drew on a long tradition of structural analyses, including work by Roman Jakobson and others with roots in the Russian linguistic circles of the 1910s, to formulate the generative and co-dependent structure of subject positions in discourse (Jakobson and Hall, 1956).

A detailed history of theories of enunciation would track its emergence in structural linguistics, beginning with Ferdinand de Saussure's *Cours de Linguistique Générale* (posthumously assembled from student notes and published in 1916)[5]. Further structuralist work by Russian Formalists Viktor Shklovsky, Roman Jakobson, Boris Eichenbaum and others stressed the relationship of the individual subject to ideology in poetics and literature (Erlich, 1980). The early twentieth century attention to formal structures of language developed into attention to the situatedness of language as a communicative act, one that was ultimately to be understood as ideological as well as esthetic. These ideas were woven into the work of post-structuralist theorists of discourse, notably Michel Foucault, Jacques Lacan, and Roland Barthes, who engaged with the study of epistemological, psychoanalytic, and cultural workings of language and power. In 1962, John L. Austin published *How to Do Things with Words*, emphasizing the performative dimension of language (Austin, 1962)[6]. At the same time, Louis Althusser described the means by which social subjects are *interpellated* into ideology. *Interpellation* describes the integration of subject into systems of belief, emphasizing the workings of power and ideology through articulation of positions in discursive systems (Benveniste, 1966).

These theoretical constructs were developed through the analysis of language, and then applied to fields as diverse as film studies, architecture, visual art, and a wide range of social practices from political speech, systems of punishment, to medical examinations (Drucker, 1989; Silverman, 1983). But artifacts and documents of information – charts, graphs, spreadsheets, data formats and expressions – were barely considered within this critical framework[7]. The reasons for this might have to do with disciplinary boundaries between social sciences and the humanities in the 1970s, and with the location of information studies and quantitative analysis within empirically grounded disciplines that resisted critical intervention. But in the 1980s and 1990s, those boundaries shifted. Practitioners of cultural studies and science and technology studies took the critical principles of deconstruction and its later developments into analysis of domains whose empirical foundations had previously been considered outside the realm of such critiques[8].

The lessons of critical post-structuralism were absorbed by cultural studies and critical studies and taken up in feminist and queer studies. They were used in fields attentive to margin and center and the asymmetries of colonial and post-colonial analyses that were justified through the dialectic of ruling subject and subjected “other.” Disciplines intent on exposing the way power works insidiously and seductively through apparatuses and discourses made use of theories of the subject in subaltern studies. Almost no field in the humanities was untouched by the influence of these theoretical frameworks or their methodological implementation. The shift of focus in recent years has signaled attention to other forms of power relations, attacks on the neoliberal state and its ideological apparatuses, or on particularities of identity politics, battles, and structural inequities of our global systems. This is not a move away from the analysis of power and/as discourse, but a maturation of techniques that absorbed these earlier lessons, even if, as is perhaps too often the case, their explicit terms and origin points are forgotten. The current vogue for debates about the agency of things, the emergent properties of systems, the ability of the universe to work in its own behalf, and of all manner of phenomena to be considered within discussions of rights of self-determination and ethical treatment should not be seen as a dismissal or disregard for the principles of critical analysis on which their premises were built (Barad, 2007; Coole and Frost, 2010). Quite the contrary. The extension of these analytic techniques into new domains could find no better arena for engagement than that which

underpins the functioning systems of global communications, commerce, and administration across human and non-human domains: information and its operations as an enunciative system. Visualization is often the public face of these systems, the site at which a user is produced as a graphed and positioned subject.

To understand how the theoretical construct of enunciation is useful for information visualization, a few of its basic premises need to be succinctly established.

Principles of enunciation

Benveniste's work focused on the structuring effect of pronouns. The use of "I" always functions as a link between the system of *langue* (language as a system) and the instantiation of *parole* (a speech act), linking the two in the concept of locution (Benveniste, 1966). Locution depends upon the situation of utterance or expression being incorporated into the meaning of the text. The "I" has no semantic fixity on its own. "I" does not stand for or represent any single concept or entity (by contrast to "James Jonas" or "a man in a blue hat") and has to be understood situationally. While Saussure insists that all linguistic elements are arbitrary, and have no intrinsic meaning, the illusion of the representational structure of language persists in daily use. While a word like "tree" seems to refer to images, ideas, and things in the world (even though the word "baum" or "arbre" serve equally well), other words in language function differently. These are pronouns and deictics, terms that can only be given value within the context of their use. The referent of the "I" who speaks, the person the pronoun represents, shifts with use.

Benveniste argued that pronouns and deictics perform a structuring role. Because they are situationally dependent, they are also constitutive and dynamic. They are the mechanism by which discourse creates relative positions. While the pronoun "I" identifies the speaking subject, the source of the discourse, it also implies, often directly states and uses, the "you" which is the term around which the "spoken" subject coheres. The spoken subject is formulated through address, through direct and indirect implication. "I is the individual who utters the present instance of discourse containing the linguistic instance *I*" (Benveniste, 1966, p. 218), and the referent, the connection to a particular speaker, cannot be identified outside of the situation or circumstance of utterance. By taking the always implicit and often explicit situation of "address" into account, one has the symmetrical definition for "you": "the individual spoken to in the present instance of discourse containing the instance *you*" (Phillips, 2006).

Theories of enunciation, and the methods that arise from their formulation, make clear that any communicative expression is an act in which someone speaks to someone for some purpose through some structuring means that creates power relations through positionality. The I/you, we/they, you/others of speech acts are markers of enunciation, instruments of power relations. The speaker's enunciation creates the position of the spoken subject. This enunciated subject is positioned by a discourse and constructed, in part, as a projection of it. The identity of human individuals, their psychic and individual traits, histories, memories, capacities, assets, and liabilities are not always acknowledged within their identity as either speaking or spoken subjects. But these attributes and/or essential features are part of the historical, cultural, and individual place from which a speaker speaks. We bring all of these qualities and capabilities to the way we speak, feel entitled or disenfranchised, and position ourselves as a result through assumptions taken on and/or internalized. This is as true in visual conventions as it is in linguistic ones, as examples below will show.

Visualizations and/as enunciations

The conventions for communicating information in graphs, charts, or diagrams make them readily legible. Perhaps, too readily, since the use of these familiar formats often allows them

to be consumed without hesitation – or critical consideration. Laura Kurgan uses these principles in her critical graphics, relying on the same legibility to make a substantive intellectual point. Her “Million Dollar Block” project exposes the perverse logic by which millions of dollars are used to support incarceration among a disproportionately high percentage of African-American residents of certain neighborhoods, rather than investing these resources in the services and infrastructure that could transform their educational and social service infrastructures[9]. The content of the graphics carries the political message. She is not addressing the enunciative apparatus of visualizations, but rather, making effective use of them. Kurgan’s work is powerful, in part, because she relies on the rhetorical force of the graphical conventions to communicate in dramatic and legible terms.

These conventions present quantitative issues in graphical form: comparative values, rates of change over time, percentages of a whole, and any other information that can be expressed in reductive formats such as network diagrams, bar charts, scatterplots, and so on. The formats are effective, efficient, and surprisingly obfuscating. The “information” they communicate is considered fully legible, but other aspects of the communicative act being performed are highly elusive. Where, in these graphics, do we find a trace of who has composed the image, or, to use a linguistic analogy, of how the graph is “spoken” by an author or interest group? A brand name or an attribution – these might appear, with a claim to the intellectual property of the information conveyed. But nowhere is there a single overt marking that indicates the image is a mode of address, a structuring instrument rhetorically engaged in productions of power. Even if indications of authorship (attribution of ideas, arguments, opinions) are present, signs of speakership (who is constructing a relationship between speaker and audience, between the “I” of expression and the “you” of imagined reception) are conspicuously absent – or seemingly absent. We take this in stride, as a perfectly reasonable way for information graphics to be constructed and to comport themselves.

The switch from passive (“be constructed”) to active agency (“comport”) is deliberate in the previous sentence. Language structures and graphical expressions have agency. They are neither neutral nor passive, a fact long acknowledged within studies of the “performative” aspect of language (Austin). Information graphics “perform” enunciative moves that are as powerful as those of linguistic expressions. But we have not paid attention to their operation or described their workings. What, for instance, are the graphic equivalents of the I/you construction which is the basis of linguistic enunciation? How does an image hail its viewer?

By asserting that graphical forms and formats are discursive expressions, we can begin to discern the ways the performance of enunciative strategies position speaking (graphing/counting/recording) and spoken (graphed/counted/recorded) subjects in information systems. Stated in that way, the enunciative aspect of information seems obvious. But information visualizations are received and read with so little attention to discourse markers and enunciative methods that making an explicit case for these features is necessary. What do graphical features have their own structuring properties that need to be identified if we are to locate the equivalent of speaking and spoken subject positions?

Several disciplines provide useful foundations on which to address these questions. Scholars drawing on psychoanalysis, post-structuralism, and feminist theory who published in the pages of *Screen*, *Camera Obscura*, and *Discourse*, such as Stephen Heath, Kaja Silverman, and Teresa Hak Cha, to name a prominent few, applied enunciative concepts to film studies (see Heath, 1978; Silverman, 1983; Cha, 1982). Victor Burgin and Laura Mulvey drew on and contributed to the analysis of visual art in which the perspectival construction of spatial systems could be readily shown to structure power through the gaze (see Bryson, 1983; Burgin, 1991). The impact of Michel Foucault’s opening essay in *The Order of Things*, a detailed study of Goya’s *Las Meninas*, rippled across disciplines concerned with visual art. He showed that every figure in the painting was subject (in all senses of the word) to the

surveillance of the pictured king through a set of reflected, intersecting, and structuring viewpoints. Foucault's study served as a vivid example of the analysis of power relations structured into human expressions whether they were articulated in language, images, spatial relations, or the social configurations that bound and were bounded by them (Foucault, 1970).

The analysis of information graphics draws on these precedents. The concept of enunciation gains easy traction when applied to graphics, but the visual expressions of statistical and quantitative information should be seen as a subset of the larger field of information generally construed [10]. The analysis also can be applied to the enunciative operations of algorithmic, statistical, documentary, record-producing, and information generating systems.

Many of the "languages" used in information are highly formal, such as computational or algorithmic expressions. But their formality does not exempt them from being part of communicative systems with all of the complexities and ideological complicity of natural languages.

All formal expressions of information are ideological. When information graphics pass as statements of fact, this enables their ideological operation. But how, specifically, do visualizations enunciate subject positions within their operations. What are the markers of discourse and how do they enact positionality? How can a table or graph be said to create a spoken – or graphed – subject? To cite Benveniste again, "Consciousness of self is only possible if it is experienced by contrast. I use *I* only when I am speaking to someone who will be a you in my address. It is this condition of dialogue that is constitutive of *person*, for it implies that reciprocally *I* becomes *you* in the address of the one who in his turn designates himself as *I*" (Benveniste, 1966, pp. 224-225).

A grid, graph, schematic tree, chart, or diagram is a cultural construct, no matter how much its visual qualities might intuitively suggest analogies with natural phenomena or processes. If anything, these formal expressions might be said to instrumentalize their neutrality, that is, make use of their apparent objectivity, to enact their ideology. The more something appears natural, the more it is cultural, as the lessons of ideological analysis so clearly teach us.

These principles can be applied to analysis of a spreadsheet, a common chart, a graphic drawn from an orthographic scheme in contrast to a perspectival one, and then an interactive interface. These are familiar forms within information discourse. All have power structures built into their formal apparatus. These can be identified as various modes of address: in framing structures, in their basic frontality, in point of view systems, and in organizations of buttons and links in support of interaction. Other aspects of graphical structure, also semantically meaningful, carry enunciative force – such as search boxes, entry forms, and even basic hierarchy of design and layout. In addition, the linguistic and numeric features of information graphics factor into production of subject positions.

In an Excel spreadsheet, the structuring of fields, naming of the rows and columns, semantic designations, and decisions about metric standards for quantitative entities are all authored activities that embody ideological values. But beyond an attribute within the filename, or identifying information in a caption or a logo, a spread sheet does not appear to express the authorial position of its making, nor of its intended "other" of reception. Or does it? We might ask the exact same question of a bar chart used to display data in the spreadsheet. Where, in the two-dimensional appearance of a graph, flat to the screen on which it is displayed, or isomorphic to the sheet of paper on which it is printed, does any possible inscription of point of view, subject positionality, appear? By contrast, an interactive interface, with its calls to action (e.g. "Search," "Continue") has a syntactic structure that lends itself to analysis of the affordances of action in an I/you relationship between user and site.

The first feature that marks the authorial locution in an information graphic, even one as basic as a familiar spread sheet, is its frame, the line between that which is and that which is not part of the graphical expression. A frame is a way of directing attention, giving focus, telling a viewer what to look at and what to disregard. A frame implicitly speaks as direct address, but it deflects that by appearing to be a statement. The frame speaks from an “I” position, but masquerades as a formulation of “this is” instead of “I assert to you” that something is the case. The framing act is powerful by virtue of its familiarity and thus its capacity to disappear from notice. But the frame is the first and most distinctive marker of enunciation. The appearance of the framed graphic is the first statement of: “Hey, you, look at me!” It is the fundamental communicative act and expression of direct address, a call from speaking to spoken subject.

Within the frame, the distribution of columns and rows, graphical features and axes performs another communicative act, by elaborating on the argument structure. The relationships structured into the organization express a point of view in which “I” am telling “you” how to read the values in the cells at the intersection of a row and column system of identities or attributes. In giving names to these elements (the spreadsheet, the rows, columns, entities, or attributes) the “I” who speaks effaces the evident marks of discourse, but not their structuring effects. The spreadsheet is a communicative expression from some speaking subject to another who is not merely a recipient, but a spoken subject – a recipient subject to the structuring effects of the graphical form. The spoken subject is positioned to receive, and this reception imprints the projected subject just as surely as an exercise book or instruction manual does. An Excel sheet is as prescriptive in its assumptions about the subject position it creates through its mode of address as a manual that says “you will now do x” – an address which assumes certain capabilities, dispositions, willingness, and subordination to the “program” of the text.

A spreadsheet says, “you will read this” according to the structuring apparatus “I” have put into it. The link between speaking and spoken, or graphing and graphed, subject positions is strong and dynamic. The spoken subject has some power – of refusal, or skeptical reading – but the power of the speaking subject lies in the assertive power of the natural-seeming statements. Their unmarkedness does not exempt them from participation in a system of enunciative acts. Spreadsheets are rhetorically powerful encodings of values and belief whose graphical features participate in their appearance of neutrality – of “unmarkedness” – through the way they graph their relations of power. The speaking subject “presents” the graphical form as if it had no value, and thus, enacts its power through an effective erasure of the structuring apparatus. The spoken/graphed subject is positioned as a passive viewer, unable to change, shift, alter the discourse or the conditions of viewing.

These basic points about spreadsheets hold true across other information graphics. Bar charts, pie charts, scatterplots, and other common forms of graphic conventions also appear “unmarked.” They seem neutral, objective, un-authored, and appear to “speak themselves,” to use the language of 1980s deconstruction. By contrast, “marked” texts identify the situation and positions of the speaker explicitly – as in perspectival views and dynamic interfaces, as will be discussed below.

In the same way that spreadsheets do not announce their direct address to the viewer, other flat graphics that use the plane surface of the page or screen to display values for comparison, change across time, simple x/y coordinate systems, seem so uninflected that it seems difficult at first to imagine how they could be conceived as enunciative acts. But the paradox of visualization graphics is that they efface the marked features of their presentation, they muffle the speech/graphical act. The frontality of graphic images, whether on the page or the screen, by their very facingness, is a dramatic embodiment of subject positionality. Not just the information on the surface/screen, but the surface/screen

itself positions the reader/viewer as the “you” of its expression. The plane of expression, the discursive field, on which a bar chart, graph, or even spreadsheet, is inscribed embodies a direct address. The frontality of the screen or graphic hails the viewer. This is a demonstrative and declarative mode. Even in the absence of marks of authorship attribution, that is, the absence of signatures or identifiers within the text, at the structural level, the relationship of enunciation is not only evident, it is overpowering. The facing screen performs an absorption of the gaze that veers between confrontational and consuming modes of engagement.

The structured relationship of the situation of viewing, to paraphrase a concept from film theory of the 1980s, can thus be analyzed as an aspect of display in a viewer’s engagement with a page, screen, or wall display as well as of graphical forms in such display (Cha, 1980; Metz, 1977). This fundamental use of spatial relations creates subject positions. The screen speaks. The viewer is positioned as the “you” who receives the “I” enunciation of the “speaking” screen. At the level of the artifact, the spreadsheet and the bar chart (interface has other dimensions as well, on account of the many devices it uses to engage and produce a subject) are constructed according to graphical systems that imply an omniscient eye. They have no vanishing points, they appear to be spoken without any historically situated or culturally specific location or agent. This omniscient view is sometimes modified through the use of orthographic and/or axonometric conventions that activate a third dimension along a z axis without incorporating perspectival systems that identify the position of a producer and produced subject. The absence of perspective does not obviate the presence of point of view. Point of view is always present. An image, a graphic, or a statement – all are always produced from some place by someone (even if, as in the caveats above, that “someone” is a distributed, aggregate, collective, corporate and otherwise non-individual entity). This is an inescapable aspect of artefactual discourse.

The scale, framing, and labeling of charts and graphs are also elements of location. They address the spoken/graphed subject saying, identifying the graphic as an object of a gaze – and, generally, an object contained within a gaze. When graphics change scale dramatically, as in a wall-sized display of information (usually in a public space), they re-position the viewer, skewing the power relation. These physical factors, as well as the artefactual ones, are all part of the enunciative system.

Visualizations that make use of the illusion of three dimensions add another feature to the transaction between speaking and spoken subject by requiring that the latter enter into an illusion. The third dimension does not exist, but is schematically indicated, positioning the viewer in relation to an imaginary space. In orthographic projections the metrics of display (x , y , and z axes) remain constant rather than registering distortions of distance or scale. Orthographic or birds-eye views inscribe their own particular structuring and ordering of representations through the way they spatialize relations of elements. An orthographic drawing slices through a data presentation or time stream as an assertion of dis-embodiedness and ubiquity. The orthographic structure asserts that the information in the visualization has no connection to a position or place. This is very different from the omniscience of the bird’s eye view, which supposes a fully surveillant perspective, one that can take in the “everything” of the presentation at one glance, but from a high point in relation to the visual field. The orthographic presentation of information suggests that the viewing subject is omnipotent but disconnected, a non-situated viewer, able to see into an image but without capacity to register their position. The gaze is undirected, and, in some sense, not able to be reciprocated.

Perspectival images inscribe the spot from which they are drawn and indicate the position of the viewer through the vanishing point and horizon lines. The viewer enunciates the image through the framing device of a plane that intersects the cone of vision. But orthographic images claim an ahistorical or universal subjectivity that is made through

the regularity of the graphical form. Within the structuring principles of their design, orthographic images have a marked disregard for embodied experience. Orthographic projections deliberately erase the speaking/spoken subject positions they still (necessarily) enact.

The fact of point of view, the inescapable realization that it is present even in the extreme case of the seemingly unmarked text, pushes the argument to address the question of why data expressions, information formats, and their visualizations have so long been unrecognized as enunciative instruments. The answer is simple. The apparent neutrality and objectivity of such graphical expressions aligns them with the ideology of empirical sciences, as if a mere statement of quantitative fact, or of order and arrangement, had no semantic (or ideological) value in its own right, but merely serves as a communicative vehicle for delivery of information. Discussion of the contrast between delivery and constitutive models of communication has a long history in critical media studies, and does not need review here. But the application of its principles to the analysis of information forms and formats is useful. But is the simple fact of making evident that visualizations are enunciative expressions sufficient? Or do we need to push further into the ways specific subject formations occupy particular locations within the power structures and regimes that subject us to their operation and controls? If we are produced as subjects of these systems, then they must be specific in each instance, and, as historical subjects, we occupy the relation to them differently, individually, even though we are spoken within their enunciative modes. The answers are all affirmative.

All of the semantically meaningful visual features of hierarchy, layout, organization of components in a graphical space have to be read as features of a structured communicative exchange. Take elements as fundamental as *x* and *y* axes, and consider how they assume an embodied orientation to reading and viewing. They position the viewing subject absolutely within a behavioral mode as well as a reading space. The same might be said for features like centrality and proximity, which can only be read in a relative sense, always by an embodied perceiving subject. Centrality is a concept, as well as a graphical expression, that only has sense within a larger cognitive framework of positionality. The act of subject formation is not merely implied by the dependence on ability to read a graphic, but on the way the structuring activity already implies a subject disposed to receive it (and be positioned by it) on specific terms. For instance, hierarchy of organization, top down structures, the tombstone/headline/masthead division of screen space, its imitation of print journalism conventions – all of these are so familiar that we forget to read their structuring principles rhetorically. An argument is being made, and by its making, reveals an organizing sentence whose imprint positions the viewer in relation to it and to the cultural codes expressed in its graphical organization.

Even features like color indicate an attitude of disposition or taste, while texture may have highly specific textual referents, and so these features identify the speaker and spoken position. The size, shape, proximity, order, color, tone, texture of visual features all work as elements of the enunciative graphical system inflected with cultural values or references. They are all inscribed with communicative effect that occurs within a dynamic of exchanged conventions. Even the insistence on conventions of legibility is already an enframing technique of ideological assertion. Every decision to choose and use any particular color or shape bears in its realization a decision about how the expression will be read. Thus it imprints its imagined or projected reader-subject in its graphical specifics. Recognition of that dynamic and structuring aspect of the graphic places it squarely within a critical frame that recognizes its enunciative workings as surely as tone of voice, inflection, volume, direction, and other aspects of what Charles Morris identified as the pragmatics of signs, are at work in linguistic enunciations (Morris, 1938). All of these features help to position the speaking subject of the discourse within a historical, cultural, temporal, ideological location and, thus, to demonstrate the assumptions built into the argument shape that speaks us as its subjects.

How can we – or should we – alter or replace the unmarked activity of information expressions? How do we inflect visualizations with a systematic critical attention to the “by whom for whom and for what purpose” interrogation? The hermeneutic move shifts the reception of these expressions as merely declarative communications to a critical reading of them as rhetorical arguments shaped by the graphical features of their conventions.

If we extend this discussion to the analysis of interactive interfaces, we begin to see the ways in which an even more explicit system of devices for engaging and producing a speaking and spoken subject is at work. The design of interactive interface, the search/query/filter repeat mode of engaging with data, creates an illusion that the structure provides the user with control. The settings in the query can be changed, customized, the search narrowed, the results of the query displayed for a specific purpose. Consider the standard search engine, n-gram viewer, repository with a search engine and graphical display, or platform for text analysis[11]. Each provides a set of features that can be clicked, slid, set, have values entered, or selections made. These actions are embodied in an I/you dynamic. The speaker of the system, the “I” embodied in the design, allows “you” certain choices (and of course, by design and by the mere fact of the limits of design, not others). The user is positioned within a disciplining structure that has, in some instances, the appearance of an open-ended system. For a moment, the spoken subject can entertain the illusion of being the speaking subject. I might imagine that I am the author of a Google n-gram query, but of course, on examination, I realize that that is not only *not* the case, but the viewer, its algorithms, and the interface through which I actively engage are all positioning me as a spoken subject of these combined features. The illusion of control or agency, even of authorship, is produced by the interaction with the features, the dials, input boxes, and so forth that all speak me as they speak to me. You, they each say, are the one who does this, and not that, or that, and then this and so on. The subject position is enacted and produced.

The standard approach to the design and discussion of interfaces is based on a consumerist model, most notably developed by Ben Shneiderman, governed by his mantra, “overview, filter, zoom.” In this model, the user is a consumer imagined as an independent, free-willed, autonomous individual fully capable of making choices, acting without constraint of system or circumstance (Shneiderman *et al.*, 2016). The extent to which such an image serves other interests (rarely those of the individual) is significant, especially when unconstrained by critical engagement with the system of subject production of which it is a part. Hiding the structuring apparatus, concealing its workings, does not make it go away. The biases of ideological positions are wired into its enunciative workings. But by calling attention to the difference between a user and a subject we point out the difference between a model of consumption and that of construction, between an illusion of autonomous judgment and a recognition of embedded and situated positionality within systems of power relations. The first (consumer) eschews all political implication, reducing the individual to a node in a system of mechanical exchanges that pretend to be operating on choice, taste, and free will. The second (subject) suggests that every act of communication in human culture is part of larger systems of power relations within which we are positioned willingly or not, but without consciousness of which we remain powerless to imagine the very grounds on which to either refuse or agree to engagement. In the first instance, we believe we act without constraints, in the second, we can consider how the constraining conditions work through us as constructed subjects. Agency, however it is achieved, does not happen merely by ignoring the conditions that restrict its operations. Political agency cannot occur in conditions of denial of the very circumstances that produce relations of power and situate us within them.

An urgency and importance thus attaches to the need to address the specific workings of information as an enunciative system, to see its expressions – forms, formats, discourses – within a critical frame that strips its apparent declarative neutrality of the stance of self-evident objectivity, and instead, returns this expression to the realm of discourse to be

analyzed for what it is – an expression of ideological beliefs that obscure the partial, situated, culturally specific, historically located, and interested nature of knowledge and information as discursive processes that create and replicate systems of power through positionality.

Conclusion

The idea that information visualizations can be understood as enunciative expressions pushes us to attend to the specific ways graphical features articulate subject positions. The frontality of the screen and situation of viewing creates a power relation between graphing and graphed subject that is analogous to that of the speaking/spoken subject of linguistic utterances. This structuring relationship enacts an asymmetrical power relationship even before the content of a visualization is taken into account. The semantically meaningful features of graphical forms – organization, hierarchy, labels, grids, directional view, and spatial systems of perspectival or orthogonal structure – all play a part in encoding ideological beliefs of omniscience, neutrality, power, and powerlessness in visualizations. Graphical utterances are not mere presentations, but are potent rhetorical instruments of cultural power, and the methods by which they work, and act, to create and enact that power, goes largely unnoticed. Rather than merely reading the content of graphics, this paper has argued that we should attend to the locutionary aspects of production, and the structuring properties through which subject positions are constituted by visual means. Visualization is enunciation, and its principles of action – its graphical acts – are everywhere apparent, fully legible, and yet rarely subject to critical analysis. We need to attend to how visualizations do their work if we are to fully understand the work that they do.

Notes

1. Drucker has argued repeatedly that information visualizations should be approached as instances of enunciation and have frequently stated that “Almost all information visualizations are reifications of misinformation,” and that “they are representations passing themselves off as presentations.” See Drucker (2011, 2014) (2016) for published versions.
2. John Burn Murdoch, “Why you should never trust a data visualization,” is useful: www.theguardian.com/news/datablog/2013/jul/24/why-you-should-never-trust-a-data-visualisation; Murdoch was responding to Pete Warden’s Blog post, “Never Trust a Data Scientist,” July 18, 2013; <https://petewarden.com/2013/07/18/why-you-should-never-trust-a-data-scientist/>; See D’Ignazio and Klein (2016) for a feminist approach; for an introduction to the field of critical data studies, see Andrew and Federica (2016); credit for first introducing the term is given to Dalton and Thatcher (2014).
3. In addition to Jones (1995) and Schmid (1983), see Few (2012), a straightforward textbook, to see how the field attends to basic issues of accuracy and legibility conceived without any complex critical theoretical frameworks.
4. Critical data studies works beginning with Craig Dalton and Jim Thatcher; see also Gitelman (2013).
5. Saussure’s *Course in General Linguistics* is considered a landmark in structuralist thinking, the model for formal, systematic, analysis of language and other cultural systems. The semiotic model of language in Saussure is the foundation for twentieth century semiotics across fields and disciplines (Lotman, 1975; Matejka and Titunik, 1976). See Jameson (1972) for a classic discussion of formalism and language.
6. Theories of the subject, see Silverman (1983), Minh Ha (1989), and Metz (1977).
7. Frohmann (1994), see the section on “The Shift to Users” introduced by a discussion of Nancy Fraser’s work on women as subjects within the social welfare system (p. 133). Politics of needs interpretation, calls for “attention to the theories of construction of the subjects inhabiting our social world” (p. 134).

8. Science and technology studies literature, e.g. Galison and Daston (2010).
9. See Kurgan, available at: <http://spatialinformationdesignlab.org/projects.php%3Fid%3D16> (accessed June, 2017).
10. Day (2014) has already taken on that larger project.
11. Google n-gram viewer, available at: <https://books.google.com/ngrams> (accessed December 20, 2016; Old Bailey Online, available at: www.oldbaileyonline.org/ (accessed December 20, 2016; Voyant, available at: <https://voyant-tools.org/> (accessed December 20, 2016).

References

- Andrew, I. and Federica, R. (2016), "Critical data studies: an introduction", *Big Data and Society*, Vol. 3 No. 2, pp. 1-7, available at: <http://journals.sagepub.com/doi/abs/10.1177/2053951716674238>
- Austin, J.L. (1962), *How to do Things with Words*, Clarendon, Oxford.
- Barad, K. (2007), *Meeting the Universe Halfway*, Duke University Press, Durham, NC.
- Benveniste, E. (1966), "La nature des pronoms", *Problèmes de linguistique générale*, Gallimard, Paris, p. 253.
- Bryson, N. (1983), *Vision and Painting: The Logic of the Gaze (1983)*, Yale University Press, New Haven, CT.
- Burgin, V. (1991), "Geometry and abjection", in Donald, J. (Eds), *Psychoanalysis and Cultural Theory: Thresholds, Communications and Culture*, Macmillan Education, London, pp. 11-26.
- Cha, T.H. (Ed.) (1980), *Apparatus: Cinematographic Apparatus*, Tanam, New York City, NY.
- Cha, T.H. (1982), *Dictée*, Tanam, New York City, NY.
- Coole, D. and Frost, S. (2010), *New Materialisms: Ontology, Agency, and Politics*, Duke University Press, Durham, NC.
- Dalton, C. and Thatcher, J. (2014), "What does a critical data studies look like, and why do we care?", Society and Space Open Site, available at: <http://societyandspace.com/material/commentaries/craig-dalton-and-jim-thatcher-what-does-a-critical-data-studies-look-like-and-why-do-we-care-seven-points-for-a-critical-approach-to-big-data/> (accessed June 14, 2017).
- Daston, L. and Galison, P. (2010), *Objectivity*, MIT University Press, Cambridge.
- Day, R.E. (2005), "Post-structuralism and information science", in Cronin, B. (Ed.), *Annual Review of Information Science and Technology*, Vol. 39, Information Today for the American Society for Information Science, Medford, NJ, pp. 575-609.
- Day, R.E. (2014), *Indexing it All*, MIT Press, Cambridge, MA and London.
- D'Ignazio, C. and Klein, L.F. (2016), "Feminist data visualization", IEEE, available at: <http://vis4dh.dbvis.de/papers/Feminist%20Data%20Visualization.pdf> (accessed June 12, 2017).
- Drucker, J. (1989), "Architecture and the concept of the subject", in Ellis, R. and Cuff, D. (Eds), *Architect's People*, Oxford University Press, Oxford and New York City, NY, pp. 163-182.
- Drucker, J. (2011), "Humanities approaches to graphical display", *Digital Humanities Quarterly*, Vol. 5 No. 1, available at: <http://digitalhumanities.org/dhq/vol/5/1/000091/000091.html>
- Drucker, J. (2014), *Graphesis*, Harvard University Press, Cambridge, MA.
- Drucker, J. (2016), "Graphical approaches to the digital humanities", in Schreibman, S., Siemens, R. and Unsworth, J. (Eds), *A New Companion to Digital Humanities*, John Wiley & Sons, Chichester and Malden, MA, pp. 238-250.
- Drucker, J. and Svensson, P. (2016), "The why and how of middleware", *Digital Humanities Quarterly*, Vol. 10 No. 2, available at: www.digitalhumanities.org/dhq/vol/10/2/000248/000248.html
- Erllich, V. (1980), *Russian Formalism: History-Doctrine*, Walter de Gruyter, Berlin.
- Few, S. (2012), *Show Me the Numbers*, Analytics Press, El Dorado Hills, CA.
- Foucault, M. (1970), *The Order of Things*, Pantheon, New York City, NY.

- Frohmann, B. (1992), "The power of images: a discourse analysis of the cognitive viewpoint", *Journal of Documentation*, Vol. 48, pp. 365-386.
- Frohmann, B. (1994), "Discourse analysis as a research method in library and information science", *Library & Information Science Research*, Vol. 16 No. 2, pp. 119-138.
- Gitelman, L. (Ed.) (2013), *Raw Data is an Oxymoron*, MIT Press, Cambridge, MA.
- Groeger, L. (2017), "When the designer shows up in the design", April 4, available at: www.propublica.org/article/when-the-designer-shows-up-in-the-design
- Heath, S. (1978), "Difference", *Screen*, Vol. 19 No. 3, pp. 51-112.
- Hjørland, B. (2000), "Library and information science: practice, theory, and philosophical basis", *Information Processing & Management*, Vol. 36 No. 3, pp. 501-531.
- Jakobson, R. and Hall, M. (1956), *Fundamentals of Language*, Mouton, The Hague.
- Jameson, F. (1972), *The Prison House of Language*, Princeton University Press, Princeton, NJ.
- Jones, G.E. (1995), *How to Lie with Graphics*, toExcel Press, Lincoln, NE.
- Lotman, Y. (1975), *Theses on the Semiotic Study of Culture*, Peter de Ridder, Lisse.
- Mandell, L. (2017), "Gender and cultural analytics: finding or making stereotypes?", in Klein, L. and Gold, M. (Eds), *Debates in Digital Humanities*, University of Minnesota Press, Minneapolis, MN (forthcoming).
- Matejka, L. and Titunik, I. (1976), *Semiotics of Art: Prague School Contributions*, MIT Press, Cambridge, MA.
- Metz, C. (1977), *Psychoanalysis and Cinema: The Imaginary Signifier*, Palgrave, Macmillan, London and New York, NY.
- Minh Ha, T. (1989), *Woman, Native, Other*, Indiana University Press, Bloomington, IN.
- Morris, C. (1938), *Foundation of a Theory of Signs*, University of Chicago Press, Chicago, IL.
- Phillips, J. (2006), "Who is the subject of enunciation?", available at: <https://courses.nus.edu.sg/course/elljwp/enunciation.htm> (accessed September 15, 2017).
- Poster, M. (1983), *The Second Media Age*, Polity, Cambridge.
- Schmid, C. (1983), *Statistical Graphics*, Wiley, New York City, NY and Toronto.
- Shneiderman, B., Plaisant, C., Cohen, M., Jacobs, S. and Elmqvist, N. (2016), *Designing the User Interface: Strategies for Effective Human-Computer Interaction*, 6th ed., Pearson, Upper Saddle River, NJ.
- Silverman, K. (1983), *The Subject of Semiotics*, Oxford University Press, New York City, NY.

Further reading

- Bal, M. (2009), *Narratology: Introduction to the Theory of Narrative*, 3rd ed. (Trans by Christine van Boheemen), University of Toronto Press, Toronto.
- Barthes, R. (1970a), *S/Z*, Editions du Seuil, Paris.
- Barthes, R. (1970b), *Image Music Text*, Farrar, Straus and Giroux (Eds), Stephen Heath, New York, NY, pp. 69-78.
- Coward, R. and Ellis, J. (1977), *Language and Materialism*, Routledge & Kegan Paul, New York City, NY.
- Foucault, M. (1972), *The Archaeology of Knowledge*, Pantheon, New York City, NY.
- Genette, G. (1980), *Narrative Discourse: An Essay in Method* (Trans by Jane E. Lewin), Cornell University Press, Ithaca, NY.
- Kitchin, R. (2014), *The Data Revolution: Big Data, Open Data and their Consequences*, Sage Publications, Thousand Oaks, CA.
- Kristeva, J. (1984), *The Revolution in Poetic Language*, Columbia University Press, New York City, NY.
- Lerup, L. (1983), *Planned Assaults*, Centre Canadian d'Architecture/Canadian Centre for Architecture, Montréal.
- Levi-Strauss, C. (1967), *Structural Anthropology*, Anchor Books, Garden City, NJ.

-
- Mulvey, L. (1975), "Visual pleasure and narrative cinema", *Screen*, Vol. 16 No. 3, pp. 6-18.
- Panofsky, E. (1991), *Perspective as Symbolic Form*, Zone Books, New York City, NY.
- Penley, C. (1977), "The avant-garde and its imaginary", *Camera Obscura*, Vol. 1 No. 22, pp. 2-33.
- Porter, T. (1995), *Trust in Numbers*, Princeton University Press, Princeton, NJ.
- Poster, M. (1993), "Databases as discourse", in Zureik, E. and Lyon, D. (Eds), *New Technology, Surveillance and Social Control*, Department of Sociology, Queen's University, Kingston, pp. 175-192.
-
- Presziosi, D. (1989), *Rethinking Art History*, Yale University Press, New Haven, CT.
- Saussure, F.D. (1959), *Course in General Linguistics*, Columbia University Press, Wade Baskin, NY.
- Shklovsky, V. (1925/1990), "Art as device", *Theory of Prose*, Dalkey Archive Press, Champaign, IL.
- Shklovsky, V. (2004), "Art as technique", in Rifkin, J. and Ryan, M. (Eds), *Literary Theory: An Anthology*, Blackwell Publishing, Malden, MA, pp. 15-21.

Corresponding author

Johanna Drucker can be contacted at: drucker@gseis.ucla.edu

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgroupublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com