

# THE EFFICACY OF EQUALITY IN 45 MEDIA REPRESENTATION OF SCIENCE

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## **The Efficacy of Media Representation of Science**

Simultaneous media appearances by people espousing opposing views represent the speakers as equals. This study explores how media create signs capable of equating the knowledge of experts in a given discipline with the beliefs and opinions of spokes-persons who present an opposing point-of-view. Semiotic analyses of programming strategies that present opposing opinions from differing world-views demonstrate media practices that raise ethical questions about representations that facilitate social discourse affecting society's acceptance of new understandings derived from science. In addition, several key concepts will be addressed that demonstrate how new work in neuroscience supports theoretical concepts including *framing*, *habitus*, *paradigms*, and Peirce's concepts of *semiosis* and the "law of mind."

Scientists explore many questions related to issues of public concern like global warming and climate change, the effects of carbon emissions, pesticides, and other chemicals, just to name a few. The work of science takes place in specialized environments among people with advanced training and specialized equipment. The efficacy of communicating scientific discoveries is minimized because public policy and everyday life are generally debated in the media. Without a shared belief in the superiority of scientific inquiry for addressing questions about the natural world, the general public must rely on their own interpretations of available information.

Two human figures juxtaposed in a media setting appear to be *iconic* representations of authoritative spokes-persons. Potential distinctions between a practicing scientist and a public relations representative for a corporation are not effectively communicated because simultaneous appearances code the speakers as equals. There are no discernable physical characteristics or linguistic codes that work to the advantage of a scientist if the audience does not recognize science as a distinctive institution primarily dedicated to seeking knowledge.

Anticipating the difficulties in communicating science to a general audience, the public relations representative specializes in communica-

tion strategies that exploit cultural codes understood to appeal to non-scientists. The public relations representative frames the issues with language intended to evoke pre-existing ideas. PR can introduce doubt without evidence while scientists depend on the enlightened reasoning that guides the *habitus* of their established institutional practices.

The concept of *habitus* refers to the preconscious ways that social organizations structure practices and representations (Bourdieu 1993: 480). Scientists, like all cultural groups, develop language and practices that are shared within the group. The habitus of science assumes the validity of scientific methods, and criteria for verification of evidence supporting knowledge. At the same time, the habitus of public relations privileges the efficacy of persuasive communication strategies, and the most effective ways to propagate ideas and information through mass media.

Thriving on spectacle, conflict, and emotionally driven content, media can attract attention to programming that elevates the relevance of opinions opposing ideas derived from arduous scientific methods. A scientist can be a *symbol* of an authoritative institution, having years of training within a culture that depends on documented evidence to support claims of knowledge. But as an *iconic sign*, a scientist can be challenged by anyone with the conviction and rhetorical skills to do so because electronic media can represent them as equivalent signs. The following essay explores the conditions of media representations of science from a semiotic point-of-view (Deely 1990) beginning with the semantic conditions of defining a scientist.

### Defining Science in Society

The preceding section asserts an assumption about the superiority of science as a way of knowing that should be privileged in public policy. Peirce defined science saying "it does not consist so much in knowing, nor even in 'organized knowledge,' as it does in diligent inquiry into truth for truth's sake, without any sort of axe to grind, nor for the sake of the delight of contemplating it, but from an impulse to penetrate into the reason of things" (CP 1:44). However, even within academic institutions, the political and economic forces of contemporary society privilege the people "who carry on the business of the world," who from Peirce's perspective, are not scientists (CP 1:45).

Peirce's definition isolates the scientist from economic forces, and imposes an opinion based on a system of values that are exclusive by contemporary standards. Considering the efforts of scientists directly related to developing products and technologies, science for the sake of knowledge is not the norm today.

### Media, Science and Society

Media provide the dominant environment for social discourse that affects public policy. There is a clear cultural divide between science and the general public. Scientists have a distinct disadvantage communicating to non-scientists through media because a great deal of knowledge is necessary to understand scientific language and evidence, and media generally restrict the available space and time for programming. Without an acceptance of the *authority* of science, a priori beliefs and popular opinions will prevail (CP 5.377-5.385). At the same time, those "practical men, who carry on the business of the world [...]" (CP 1:43), have only to introduce doubt, and without providing evidence, they can strategically appeal to the popular opinions of the general public. With the exception of programs specifically intended to feature science, the *habitus* of media institutions imposes cultural practices that represent simple information quickly, and with a high level of emotional impact, but are not conducive to providing longer formats necessary to develop in-depth knowledge and insight into the complexities of science. In contrast to the formulaic representations of media, the work of science is not generally conducted nor communicated with immediacy or emotional appeal.

The knowledge and practices of scientists are necessarily exclusive to their specific disciplines and are not understood by the uninitiated. Thus *framing* public communication of science as a top-down educational model becomes problematic in public forums for debate in the media. *Framing* refers to the way language helps to construct the contexts, or categories that structure thought. "Frames are among the cognitive structures we think with" that organize expectations expressed by language within a given context (Lakoff 2009: 22). Words that can be grouped together as a semantic field share a common *frame*.

Examples of frames could be the names of objects and the kinds of people you would expect to find in a hospital such as doctors, nurses, and patients, or the language you would expect in a weather report (Lakoff 2009: 22-23). Frames help people think in terms of categories based on previous knowledge, but they also limit the necessity to make critical distinctions that are important for understanding new ideas.

Lakoff claims that the weaknesses of what he calls "Old Enlightenment" reasoning, based upon rational thinking, is that most of the frames that affect the way we live are "unconscious and reflexive" (2009: 249). In a semiotic sense, *frames* function like the *habitus* as structuring, organizing principles of thought that are generally already established as habitual ways of thinking. The mind processes chance events, or new ideas, and interprets them by cognitively seeking established habits of understanding. Likewise, Peirce's "law of mind" sug-

gests that ideas tend to “lose intensity, and especially the power of affecting others, but gain generality and become welded with other ideas” (CP 6.104). The character of the *frame* facilitates understanding by association with other ideas, but the specificity of science is sacrificed in order for the audience to get a general idea. Again, science is at a disadvantage with most audiences because new ideas must be expressed within the limits of pre-existing frames in order to communicate at all, even though the essence of scientific discovery might require difficult concepts and discipline-specific language. At the same time, the public relations expert has the advantage of exploiting popular opinions and planning persuasive communication strategies.

### Framing as a Process of Coding Paradigms

A *frame* is essentially a collection of signs coded to be associated with other signs sharing complex relationships acting simultaneously as a category or semantic field. A *frame* functions iconically by suggesting that a sign resembles other signs. At the same time, each sign within the frame is actually a symbol standing for a socially constructed concept, but received by an interpreter as if it were an index pointing to an existing *paradigm*. A paradigm is “a group of signs that, though different, are so related to each other that they either can (1) stand for general ideas or principles or (2) be exchanged for each other” (Vande Berg, Wenner, and Gronbeck 2004: 77). The essence of a paradigm is not “an object before the focused eye of science, but a sense or *feeling* about how the world works” (Gaines 2005). A “feeling is simply a quality of immediate consciousness” (CP 1.307). Given the reflexive nature of automatic responses, *framing* promotes an immediate sense of understanding without necessarily making conscious connections between the sign and an existing object or idea.

But again, Peirce’s “law of mind” (CP 6.104) applies because *framing* depends on a habit that emerges when an interpreter automatically associates a sign with a generalized system or code. Likewise, a *frame* is interpreted when it acts as a sign that can “gain generality and become welded with other ideas” (CP 6.104). Paradigmatic codes are constructed of general characteristics shared with the other signs and associated within the *semantic field*, another name for the frame. The frame then effectively establishes a habit of understanding closely related to other signs generated by the continuous process of *semiosis*.

*Semiosis* is “an action, or influence, which is, or involves, a coöperation of three subjects, such as a sign, its object, and its interpretant, this tri-relative influence not being in any way resolvable into actions between pairs” (Peirce CP 5:484). The interpretant describes a continuous potential to generate new signs with each instance of interpreting a

sign and its meaning (Peirce CP 1:339). According to Peirce (1913: 463),

When it happens that a new belief comes to one consciously generated from a previous belief—an event which can only occur in consequence of some third belief (stored away in some dark closet of the mind, as a habit of thought) being in a suitable relation to that second one—I call the event inference or reasoning.

An association derived from a *frame* can be the result of logical inference, but logic does not affirm the veracity of an interpretation.

### Neuroscience, the Frame, and the Theory of the Lie

New understandings of neuroscience help explain how the brain facilitates *semiosis*, and by extension, the process of *framing*. Particular regions of the brain are shared and activate other related functions. "The same part of the brain we use in seeing is also used in imagining that we are seeing, in remembering seeing, in dreaming that we are seeing, and in understanding language about seeing. The same is true of moving" (Lakoff 2009: 39). Signs that share characteristics activate similar areas of the brain, and conversely, the brain activates associated signs. Thus as *frames* form patterns of association, even of emotions such as fear, *semiosis* can become a reflexive response to a particular set of signs.

The brain functions out of habit, exhibiting the character of habitus, and establishing laws of interpretation. But when a *frame* stimulates a reflexive response to a semantic field, there is the danger of ideas becoming self-referential. As Lakoff explains, "most of our thought—an estimated 98 percent—is not conscious. [...] Unconscious thought is reflexive—automatic, uncontrolled" (2009: 9). A frame can be invented for the purposes of persuasion. Once established, any reference to the frame can stimulate unconscious interpretation without the necessity of evidence. Thus a self-referential, solipsistic process suggests a feeling that something is verified because it fits a pre-existing assumption related to an established frame. However, like all sign processes, the nature of the frame is that it can potentially represent a lie (Eco 1976: 7):

A sign is everything which can be taken as significantly substituting for something else. This something else does not necessarily have to exist or to actually be somewhere at the moment in which a sign stands in for it. Thus *semiotics is in principle the discipline studying everything which can be used in order to lie*. If something cannot be used to tell a lie, conversely it cannot be used to tell the truth: it cannot in fact be used to tell at all.

Thus, when science is debated in the media, the structures of the institution, and the people staging an event control the framing of the

discourse. An over-simplification of ideas will appeal to an audience's tendency to accept what they already believe, which may not be true.

Of the five general ways that Peirce described for settling opinions (CP 5.377-5.385; Liszka 1996: 99-104), media tend to strengthen representations of a priori beliefs, popular opinions, and the tenacity of opinion leaders. Beliefs and opinions, by definition are not based on conclusive evidence, but appeal to familiar *frames* relating to pre-existing beliefs. Only the rigor of scientific methods and the "ongoing process of inquiry" can provide verification in the long run because "the possibility of truth rests on an appeal to the real, understood as something that cannot be changed by human convention [...]" (Liszka 1996: 102-03). Actual existent phenomena are unaffected by opinions and interpretations drawn from various cultural perspectives. But ironically because of the democratic process, policy decisions are influenced public perceptions.

### Public Perceptions of Scientists

In a culture that understands the appearance of information in the media as a form of verification, a speaker is a multi-dimensional sign. In the age of mass media, specialists gifted in persuasion develop communication strategies to represent the goals and attitudes of a client that is usually concerned with maximizing profit or maintaining political control. The expression of the economic and political agenda of a dedicated spokesperson is equated with the *symbolic* authority of the scientist who is dedicated to the "diligent inquiry into truth for truth's sake, [...] from an impulse to penetrate into the reason of things" (Peirce CP 1:44).

As Peirce explains, "Reason concerns the man who is coming to believe, not the man who believes already" (CP 8. 54). Endless media productions blur distinctions between facts and fiction, and tend to reinforce popular opinions and a priori beliefs.

Those that control the media decide what and how messages and ideas are produced and distributed. Even considering the democratizing effects of Internet access, most people use the major media outlets owned and operated by powerful commercial interests who are inclined to maintain the status quo and thus preserve their own dominance and prosperity. Eventually, however, competition between ideas facilitate the processes of "settling opinions" that should ultimately demonstrate the veracity of the established methods of the scientific community. Many debates about science and innovation, however, languish in protracted disputes for hegemony as opposing interests compete to control the fate of an idea.

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