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Minimizing the Dangers of Air Pollution Using Alternative Facts: A Science Museum Case Study

David Haldane Lee

A science museum exhibition about human health contains an exhibit that minimizes health impacts of air pollution. Relevant details, such as the full range of health risks; fossil fuel combustion; air quality statutes (and the local electrical utility's violations of these statutes), are omitted, while end users of electricity are blamed. The exhibit accomplishes this, not through outright falsification, but through selected "alternative facts" that change the focus and imply misleading alternate explanations. Using two classical rhetorical concepts (the practical syllogism and the enthymeme) allows for the surfacing of missing evidence and unstated directives underlying multimodal rhetoric. By stating multimedia arguments syllogistically, a technique is proposed for revealing hidden political sub-texts from beneath a putatively disinterested presentation of facts. The piece should be of interest to researchers, message designers and policy makers interested in the rhetoric of science, ecology, health and museums.

KEY WORDS: Pollution; science museums; alternative facts; practical syllogism; enthymeme

Introduction

In an open letter, 454 scientists called for the removal of Mercer Foundation chair Rebekah Mercer from the American Museum of Natural History (AMNH) Board of Trustees, because of her foundation's support of climate change denialism. The letter states that the Mercer Family Foundation gave millions of dollars to organizations who attack climate science and government policies intended to protect the environment, including the Heartland Institute who, in turn, fund other climate change denialist front groups ("Open Letter..." 2018). These organizations claim "...carbon dioxide pollution is beneficial for ecosystems, agriculture and humanity, a position in clear conflict with the international scientific consensus on climate change" according to the 454 scientists ("Open Letter..." 2018). The scientists calling for Mercer's resignation maintain that having climate change denialists on the board of a prestigious science museum undermines "public confidence in the validity of the institutions responsible for transmitting scientific knowledge" ("Open Letter..." 2018).

The Rebekah Mercer controversy, while not the subject of this paper, serves as a starting point for a study of the selective presentation of facts at science museums. Using case examples, I wish to suggest how, through omission, climate change denialist rhetoric is instantiated in a science museum exhibit about air pollution. I argue that the exhibit minimizes the harms to human health associated with breathing polluted air, while obscuring the role of fossil fuel combustion. While never resorting to outright misinformation, the exhibit presents an alternative set of facts to ambiguate the causes of pollution, and take policy solutions off the agenda. This paper argues that "alternative facts"—used to minimize the problem, change the subject, or place the blame elsewhere—while inimical to the greater truth, need not be false.

This research is at the intersection of the rhetoric of health and medicine and museum studies, with brief excursions into literatures such as the interactional communication perspective, argumentation, and speech act theory. To provide a preview for the reader, before I describe the exhibit, I situate this study within scholarship on indirect commands and rhetorical studies of museums. I endeavor to unpack two terms: the practical syllogism and enthymeme, used to refer to arguments where the audience (in this case, the museum visitor) is expected to supply one or more unstated propositions of an argument—or to draw a conclusion that follows from the stated information. After describing the exhibit, I state multimedia arguments syllogistically, muting selected premises and conclusions, to infer probable meanings, not stated explicitly. Finally, implications of the study are drawn out that will be of interest to readers of this journal concerned with medical and health policy, including an alternative definition of “alternative facts” intended to defend the concept of truth against a politically debilitating devaluation of it.

On Prescriptive Exhibits

In science museums, visitors are invited to turn wheels, pull levers and press buttons. In what other ways do the exhibits prescribe a course of action for the visitor, even after their visit? This piece follows up on previous work (Lee 2017, 2018; Lee, Steier, and Ostrenko 2013) about the prescriptive (and not just descriptive) purpose of museums, also noted in the museum rhetorics literature. For example, Sharon Macdonald (1998) notes how political agendas are inscribed in the classification and juxtaposition of objects (3). Carole Blair (1999) describes the capacity of memorial sites to induce affective responses and preferred interpretations (46-47). John Lynch (2013) describes how the Creation Museum discounts factual evidence of evolution by relying on theistic beliefs and values presumed to be held by visitors. Kenneth Zagacki and Victoria Gallagher (2009) chronicle an outdoor exhibition that enacts environmental concerns extra-discursively (188). These and other museum studies suggest the potential for exhibits to move audiences into action. In the case of environmental concerns, such as pollution and climate change, museums in general, and science centers in particular, emerge as vehicles of redress, whether at the level of individual behaviors, policies or mass movements.

In October 2018, the Intergovernmental Panel on Climate Change (IPCC) issued a dire warning about immanent public health dangers from warming temperatures, including floods, droughts and extreme heat. The report indicates drastic reduction of carbon emissions is required avoid these consequences (Rhodes 2019). Science exhibitions can play a role in diffusing this information and building the political will to affect changes. The Association of Science and Technology Centers (ATSC 2014) estimates 95 million science museum visitors worldwide in 2012, indicating a large audience for exhibitions prescribing a course of action in addition to informing.

One study of climate change exhibits shows how museum executives, staff members, and visitors view the science center as a political actor. Fiona Cameron (2011) presents data collected from surveys, focus groups, and interviews about science museums and climate change. Science museums were predominantly viewed as trustworthy and lacking in “vested interests” (Cameron 2011, 92). While museum executives espoused a “normative imperative” of impartiality (Cameron 2011, 94), the goal of “the majority of institutional staff” was to mitigate the effects of climate change by using science as a “lever” to change behaviors (97). Visitors in the study appeared to view museum exhibitions in similar prescriptive terms. In the words of one respondent, “Institutions motivate people...they come here, they see it, they say what can I do, this is what you

can do...” [sic] (Cameron 2011, 98). This quote suggests how visitors seek an action step as the conclusion of a presentation of scientific facts.

Site and Research Methods

Case examples presented here are derived from a study of a science museum exhibition focused on human health. *The Amazing You* (TAY), located at the Tampa Museum of Science and Industry (MOSI), is sponsored and funded by federal, state and county agencies; private health insurance companies, area medical providers; device manufacturers and biotech firms. Data collected includes reference videos, 71 completed exit surveys, and about four hours of recorded interviews (University of South Florida IRB protocol CR3_Pro00008038). My approach to data collection was inductive, in that I did not begin with a testable hypothesis or specific research question. For two weeks I spent about five hours a day at the museum, first filming myself interacting with each exhibit. Later, I typed detailed descriptions of exhibits based on these videos, highlighting certain passages and noting emerging themes. Methodologically, this approach was inspired by Gunther Kress’ (1997) notion of transduction, or meaning making across modes, which, in this case, meant turning visual and tactile experiences into written discourse. Once converted into descriptive text, it was easier to compare to interview transcripts to identify themes.

A science museum exhibit is not exclusively visual, as visual, televisual and three dimensional components work in concert with text. Because the exhibition contained so much text, as well as images, models, and videos, I was inclined towards a multimodal approach, where there is a less strict division of labor between visual and verbal studies (Jewitt, Bezemer, and O’Halloran 2016, 3). Upon IRB approval, and after obtaining informed consent from participants, I spoke at length with 21 museum executives, designers, funders, volunteers and visitors. Because I asked open ended questions, informants only spoke about certain exhibits, and only one mentioned the specific exhibit covered in this piece.

One of the major themes to emerge from both interview transcripts and exhibit descriptions was the prescriptive or interventionist bent. TAY is an exhibition designed for the explicit purpose of influencing health behaviors, according to executives and designers interviewed. The noisy, dimly lit exhibition shows fetal specimens in glass jars, a macabre warning about antenatal smoking and drinking. Visitors to the childhood section are urged to read to their children in order to spark neural development. In adolescence, visitors are exposed to graphic images of sexually transmitted diseases, a classic scare tactic used in sex education films. In adulthood, they dodge sports injuries, tobacco and ultraviolet radiation, and in old age, are exhorted to complete crossword puzzles to postpone the onset of dementia. Sometimes, exhibit titles issue commands in the imperative grammatical mood. For example, “Do This, Not That!” about screening for diseases; “Stay Active!” about exercise; “You Be the Doctor” where the visitor assumes the clinician role, and “Be Kind to Your Sweet Heart” about preventing cardiovascular illness. Often, however, the action step is not stated outright, but is only implied, or logically follows from the information presented. To provide an example, one exhibit lists hundreds of different toxic chemicals created by cigarette smoke, which, arguably, serve as a directive to avoid smoking, even though not explicitly stated.

Throughout this factual presentation of human life, there is a question about how to derive “ought” from “is,” to paraphrase David Hume (Hume 2000). Namely, how do behavioral imperatives follow from supposedly value-free facts? Communication theorists have commented on the descriptive (is) and prescriptive (ought) aspects of communication using various

terminology. Any message can be considered at the level of “report” (the informational, factual component), and “command” (an often tacit message about what the recipient should do with the information) (Watzlawick, Bavelas, and Jackson 1967, 51-52). In speech act theory, a similar distinction is made between “propositional content” and “illocutionary force” (Katz 1980; Searle 1969), the latter sometimes only a covert component of a message. “Indirect directives” (Searle 1975) can describe statements of fact that double as commands (63). Norman Fairclough states that, while overt commands reveal asymmetrical rights and duties, indirect commands can mitigate an imposition (1989, 157). Messages about health, whether issued from doctors, government agencies, or science museums, can take the form of encouraging, warning or threatening, and represent an imposition on the recipient’s autonomy (Lee 2013, 197). Indirect directives are used in health communication messages to attenuate the imposition of an overt command.

Facts about human health, stated in the indicative (AKA declarative) grammatical mood, often point towards behavioral mandates that go unstated, but follow as a matter of course. A slogan such as “seat belts save lives” is a statement, syntactically, but it is understood to contain a tacit imperative to buckle up. “Quitting smoking now greatly reduces serious risks to your health,” which appears on cigarette packages, is the same kind of phrase, functioning as a statement of fact and as an indirect directive to quit. This essay presupposes that indirect directives can also be non-verbal, as illustrated in the following example from TAY: Consider two pairs of human lungs, in glass jars, suspended in formalin, one set pink and buoyant, the other sooty and shriveled. Arguably, in the context of a prescriptive health exhibition such as TAY, the exhibit functions pragmatically as a plea to quit smoking.

The concept of indirect directives has precedent in the ancient art of epideictic rhetoric, concerned with praise or blame. Unlike deliberative rhetoric, epideictic doesn’t directly exhort or dissuade, but Aristotle describes “a particular interrelation between praise and advice” (1932, 52), since advice derives from the consideration of praiseworthy acts (p. 53). As John C. Adams explains, the ascription of virtue or vice to an action effectively plots a course of action for those who would imitate it (2006, 297). Short of commanding, discourse of praise or blame at least implies a preferred course of action. Next, I expand on additional rhetorical terms denoting forms of communication with tacit elements.

Unpacking the Practical Syllogism and Enthymeme

A concept related to the matter of implicit commands is the “practical syllogism” (Aristotle and Crisp 2000; Broadie 1968; Gottlieb 2006; Schiller 1917). In a practical syllogism, the conclusion is the performance of an unstated action step, necessitated by the premises. For Aristotle, the practical syllogism consists of a general maxim or “should” sentence (Hare 1978, 26) applied to some particular case. As the general subsumes the particular, an action becomes necessary. An example of a practical syllogism, adapted from Aristotle, happens to be an ancient health promotion mandate:

Major premise: Exercise benefits people

Minor premise: I’m a person

Conclusion: [person exercises]

(adapted from Hammond 1902, lxxv)

The practical syllogism could be mischaracterized as having an imperative as the conclusion, such as, “Exercise, now!” I use square brackets in the above example (and throughout this essay) to distinguish the performance of an action from a verbal proposition. As Robert Hare (1978) emphasizes, the conclusion of a practical syllogism is not an imperative urging the action, but the execution of it (26). As such, it can be seen as another instance of an indirect directive, with an unstated imperative entailed by the preceding indicative statements.

To understand the practical syllogism, it is helpful to consider a similar kind of argument with unstated components, the enthymeme, usually defined as a syllogism with an unstated premise or conclusion. In his discussion of enthymemes, Aristotle advises that, when attempting to persuade, “you must not begin the chain of reasoning too far back” (1932, 155) because it would be impractical to prove all the constituent, taken-for-granted assumptions comprising an argument. In the absence of proof, rhetors rely on unstated signs, probabilities and background assumptions (Knight and Sweeney 2007; McBurney 1936; Smith 2007). While avoiding the infinite regress of having to state each constituent claim, enthymemes are tools of informal logic or practical reasoning, lacking the rigor of formal proofs (Aristotle 1932, 5). Because they are probabilistic rather than certain, and contain both muted and explicit propositions, Douglas Walton writes about enthymemes, “There is a danger of logic becoming unstuck here, in a sea of fluctuating premises” (1987, 135).

Do practical syllogisms and/or enthymemes sometimes enable hasty conclusions? Given a human tendency towards confirming previously held beliefs (instead of entertaining factual information to the contrary), some rhetors cherry-pick facts that would apparently confirm beliefs already held by the audience. The omitted information can be compared to the muted premise of an enthymeme, or the muted action step of a practical syllogism. Here is an example, from the discourse of climate change denialism: carbon dioxide (CO₂) increases the rate of photosynthesis (Sneed 2018) so wouldn’t rising atmospheric CO₂ levels be good for plants? Yes, according to a 2017 opinion piece by Congressman Lamar Smith, then chair of the U.S. House Committee on Science (Sneed 2018). Yet climate scientists quoted in *Scientific American* caution that any potential positive effects from increased CO₂ fertilization would likely be outweighed by negative effects, such as nutrient loss and temperature increases associated with higher atmospheric CO₂ (Sneed 2018). “Alternative facts” such as CO₂ fertilization, while used to imply a counter-factual conclusion, are not, in themselves, technically false. Given its inexplicit conclusion, the practical syllogism is at risk for facilitating a logical fallacy, such as:

Major premise: Plants are good for the planet
Minor premise: Carbon dioxide is good for plants
Conclusion: [End emissions standards that curtail carbon dioxide]

This example suggests how a practical syllogism can enable a hasty generalization, in the event that a premise is incorrectly formulated, and/or propositional contents (such as nutrient loss and other negative effects of higher temperatures) are elided. Here is an additional example: Researchers in Manitoba found a higher incidence of heart attacks in cold weather (Tofield 2017). In a selective use of evidence, a Heartland Institute report entitled *Climate Change Reconsidered* uses this finding to conclude that higher temperatures are beneficial to human health (Bast and Bast 2019, 26). Although the findings linking myocardial infarction with cold weather are not disputed, the conclusion about better health due to hotter temperatures isn’t warranted, as it leaves

out other negative health effects of warming temperatures, such as heat waves; extreme weather events; increased water and vector-borne diseases, etc. (EPA 2017a).

In this section I tried defining the practical syllogism and enthymeme as arguments containing unstated information or implicit action steps. Their paradigm cases are entirely verbal, but in the discussion that follows (after the exhibit description, below), I apply them to multimodal science museum rhetoric that mixes visual and verbal elements. This presupposes, along with theories of visual enthymemes (Blair 2004; Smith 2007), that such arguments need not appear in their paradigmatic syllogistic form.

How Clean is Your Air? Exhibit

A multi-paneled exhibit, located in TAY's adulthood section, called "How Clean is Your Air?" (HCIYA) is about 2.5 meters long, with vertically and horizontally angled panels forming a concave shape. A plaque states it is the result of researchers from a nearby public university, and was funded by a National Science Foundation grant. Four blue panels contain the large, upper case titles, WHAT, WHERE, HOW & WHO. The first panel asks "WHAT is in your air?" stating that air is 78% nitrogen, 21% oxygen, and 1% water vapor or other gases. "Dirty air" is composed of carbon monoxide, sulphur dioxide, nitrogen oxides, hydrocarbons, ozone, and particulate matter such as ash and lead. Although a photo below shows smokestacks billowing smoke, fossil fuel combustion isn't explicitly mentioned as the source of these pollutants. An air quality index (AQI) chart is color coded from green, to yellow, to orange, to red, and then to dirty brown signifying the most polluted air. Underneath the chart, a heading asks, "What are the effects of urban air pollution?" and lists difficult and painful breathing, lung damage (especially for children), and cardio-pulmonary problems (especially for the elderly).

The second panel asks "WHERE does urban air pollution come from?" A list states it comes from many activities and sources, including volcanos and trees in addition to automobiles and industry. Under the heading "Do My Actions Create Air Pollution?" it reads, "Many of the activities we do and products we use create air pollution." A row of photos shows a cell phone, TV, leaf blower, pick-up truck and sink. Text explains how frequent purchases, leaving the lights or sink on, and driving places that we could have walked to all contribute. Embedded in the WHERE panel at eye level is a touch screen and trackball roller. Pressing a button initiates the "Air IQ" quiz. A series of questions appear on the screen along with a photo or graphic. The first question asks "when choosing between a bath and a shower would you rather

- a) Take a long hot bath
- b) Take a short, warm shower?"

If you answer "shower," a congratulatory image springs onscreen that reads "Good job! You helped reduce urban air pollution!" The quiz continues with multiple questions in this vein.

The third panel has the headline "HOW does air quality impact me and my community?" Underneath are maps showing ozone concentration in the U.S., along with text noting how volatile organic compounds (VOCs) and nitrogen oxides (NOx), heated by the sun, recombine into ground level ozone (O₃). The HOW panel states, "Different people can experience different air pollution levels depending on the air quality where they live, work, attend school, and play." This text is bracketed by two large photos. On the left, a man overlooks a smoggy vista of buildings. On the right, a man lays on green grass, knees bent, with hands placed behind his head, amidst a thicket of green foliage.

The last panel reads "WHO works to keep our air clean?" Here the exhibit profiles

individuals whose work is somehow concerned with air quality. Underneath a photo of a woman riding a bike we learn that Deborah “helped to develop a master plan for public transit across eight metropolitan areas.” Chuck, a mustachioed man in a polo shirt, incongruously petting a kangaroo, is employed by German multinational Siemens AG, and equips power plants with carbon capture devices (an allusion to fossil fuel combustion as a source of pollution). He likes skiing and the gym. We also meet Esther and Wilson, who work for the Hillsborough County Environmental Protection Agency and “ensure that companies do not release more pollutants than are allowed.” Their biographies also describe them as outdoor sport enthusiasts.

Discussion

HCIYA is a factual and informative science exhibit, however, considering that TAY is medically focused, it is notable for a lack of information about health and disease. “WHAT is in your air?” asks about the effects of urban air pollution, rather than harms to human health. Arguably, the public health impact is understated, as it omits ischaemic heart disease, stroke, chronic obstructive pulmonary disease (COPD), lung cancer, and acute lower respiratory infections in children, resulting in an estimated 4.2 million deaths annually (WHO 2019). Air pollution is also estimated to cause one out of five preterm births, worldwide (Malley et al. 2017). While what is said in the WHAT panel about health effects are not untrue, they potentially attenuate the perception of risk, by generally stating some risks for certain age groups and leaving out others. Restating the exhibit as a practical syllogism with an unstated action step supplies a potential misinterpretation for those who are not children or elderly:

Major premise: Children and the elderly shouldn’t breathe polluted air.

Minor premise: I’m not of either demographic.

Implied action step: [Breathes polluted air with less concern than affected age groups].

The WHERE panel uses a figure of speech called a retronym, with the term “pollution” gaining more specific meaning when modifiers “urban” and “air” are added. The “urban” retronym allows for the omission of its antonym, namely, “rural” air pollution. Ammonia from fertilizer and livestock waste are major sources of air pollution in rural areas (Bauer, Tsigaridis, and Miller 2016), a fact omitted from HCIYA. While it is technically correct that there are “natural,” non-human sources of air pollution, it would be untrue to assert, as Ronald Reagan did, infamously, in 1981, that “trees cause more pollution than automobiles do” (quoted in Radford 2004). Although trees emit VOCs (including terpenes and isoprenes) that interact with NO_x to form ground-level ozone, they also absorb CO₂ and emit oxygen, doing more good than harm (NASA 2013). By the same erroneous reasoning, the sun could be described as a ‘source’ of pollution because it heats NO_x and VOCs to make ground level ozone (EPA 2019). The proposition “pollution is caused by multiple things, including trees” while true, deflects attention away from the true culprit. The Carbon Majors Report asserts that just 100 fossil fuel producers are responsible for 71% of all global emissions (Griffin 2017).

While the WHERE panel begins by equivocating about the causes (blaming volcanos and trees as well as automobiles and industry), right afterwards, there seems to be an admission that human activities are the primary source of air pollution. However, instead of fossil fuels, the individual end user of electricity is framed as culpable. The implied argument here might be stated as an enthymematic sorites, with multiple premises, both explicit and implicit:

Explicit major premise: Air pollution results from electricity use.
Implicit minor premise 1: Electricity is produced by burning fossil fuels.
Implicit minor premise 2: Fossil fuels are burned because consumers use electricity.
Explicit conclusion: Consumers cause air pollution.

The above polysyllogism is enthymematic because it supplies two unstated premises about the role of fossil fuel combustion in air pollution. That consumers, by using electricity and driving, are implicated in air pollution, is a matter of fact, but it omits key information about the primary source of carbon emissions. No mention of renewable energy, mass transit, or hybrid/ electric vehicles, the use of which would lessen air pollution. Based on the truncated information presented here, what is the action step?

Major premise: Electricity causes air pollution.
Minor premise: People should use less electricity.
Implied action step [No renewable energy or policy solutions required].

The HOW panel provides an equivocal answer to the question of how air pollution affects the community: “Different people can experience different air pollution levels depending on the air quality where they live, work, attend school, and play.” Photos of a smoggy city, juxtaposed with an idyllic green vista, seem to imply the following:

Major premise: Air pollution should be avoided.
Minor premise: Cities expose you to air pollution.
Implied action step: [Moves to suburbs or country].

To move away from polluted areas may be desirable, but it is an individual solution to a societal problem that leaves the status quo unchallenged. As presented here, the leverage point (Meadows 1999) is apolitical, and doesn’t involve energy infrastructure, the legislative process, or enforcement of regulations.

The WHO panel is an example of epideictic rhetoric that doesn’t issue explicit commands, but instead deems individuals as praiseworthy. Personal details, such as outdoor activities, helps associate those profiled with the natural environment. The choice of individuals profiled is arguably biased towards county officials and corporations, and some local details about the region where the exhibit is located can help provide context. “Tampa Bay has one of the worst public transit systems in America” according to a 2017 headline (Johnston and Zhang 2017), which might raise questions about the person lauded for mass transit accomplishments. Tampa Electric (TECO), the local electrical utility, appeared on the “Toxic 100 Air Polluters” list (PERI 2010) and, in 2000, paid a \$3.5 million EPA fine for failing to install emissions control equipment in violation of the Clean Air Act (EPA, 2017b). While not subsequently fined, “significant” violations continued long after (Hodalski-Champagne 2015, 75-76). More recently, the American Lung Association assigned the county a grade of F for unhealthy amounts of ground level ozone (Morris 2017), and prior to 2018, the county was in violation of the National Ambient Air Quality Standards for lead levels in the air (EPA 2018). The mention of these historical details is intended to acknowledge other matters of fact that, if included, would have had altered the exhibit’s meaning. While TECO officials do not appear in the WHO panel, some of the county regulators profiled were on duty

when TECO was found in violation of federal environmental protection statutes, but no details are provided about their role in identifying the violations, or enforcing clean air statutes.

To answer the question about who works to keep the air clean, a different exhibit might have profiled federal legislation such as the Clean Air Act, or the Air Quality Act. A different exhibit may have highlighted the role of the environmental movement and activist organizations who press for stricter regulations and corporate accountability. HCIYA, however, is not this imagined, different exhibit. While what it implies is not totally evidential, informed speculation about unstated action steps can be plausibly inferred using the practical syllogism. If we accept the axiom that any communicate operates at the level of “report” and “command,” then what is the exhibit is telling us to do, even implicitly? Speculating on a series of erroneous, implied action steps, with missing major and minor premises, it arguably prescribes the following:

[Don’t fear cancer, stroke, preterm birth and death as resulting from air pollution].

[Don’t worry, children and elderly are most at risk].

[Don’t consider fossil fuel combustion as the main source of air pollution].

[The cause and solution are individual, not structural, political or legislative].

[Don’t consider the ozone layer hole, acid rain or climate change as effects of air pollution].

[Move to the suburbs or country].

[Trust your local officials].

While the above never appears explicitly in the exhibit, admittedly, the component propositions implying them appear to be factual. True, VOCs are emitted by trees, but what is being implied in the selection of this fact over others? Yes, pollution causes breathing problems in children and circulation problems in the elderly, but what about the rest of the population, and other risks, like cancer, preterm birth, and premature death? True, individuals should use less electricity, but what about a societal shift to renewables? True, local regulators protect air quality, but how about federal statutes and environmental activism? Yes, there is a picture of smokestack and a brief mention of carbon capture technologies, but why is coal burning not identified as a major source of pollution? That the exhibit is misleading, while manifestly factual, leads to a claim I wish to make about “alternative facts.”

Towards an Alternative Definition of Alternative Facts

The term “alternative facts” made its debut on a televised interview about the size of the crowd attending the 2017 presidential inauguration. Since the term was used to characterize a fallacious claim, the newscaster replied that alternative facts “aren’t facts, they are falsehoods” (Bradner 2017). The term has come to mean a “willingness to persevere with a particular belief, either in complete ignorance of, or with a total disregard for, reality” (Strong 2017, 137). While commentators closely associate it with “post-truth” politics (c.f. Tsipursky 2017), an alternative definition is needed that does not oxymoronically couple facts with falsehood. *1984* by George Orwell reportedly became a best seller as a result of the “alternative facts” comment (Freytas-Tamura 2017), and while the term is sensible as Orwellian double-speak, I wish to define it more literally, so that it isn’t a contradiction in terms. Since a fact can’t be false, by definition, I am using the term to mean a matter of fact, selected and asserted for misleading purposes.

Take for example, the fact of CO₂ fertilization, used to claim that increased CO₂ levels are beneficial, or the fact that trees emit VOCs, used to ambiguate the causes of air pollution.

These partial truths are used to imply incorrect conclusions and inhibit political mobilization on behalf of air quality. My definition of alternative facts accords with Neil Postman's (1985) definition of disinformation, which,

...does not mean false information. It means misleading information—misplaced, irrelevant, fragmented or superficial information...that creates the illusion of knowing something but which in fact leads one away from knowing (107).

Unfortunately, the dictionary definition of disinformation as “false information...intended to mislead” (Lexico 2019), contradicts Postman's.

The reason for an alternative definition of “alternative facts” is to defend facts and truth as (at least), normative concepts, the abandonment of which would be strategically debilitating when seeking environmental justice. As Orwell lamented, long before the present age of fake news, “The very concept of objective truth is fading out of the world” (Orwell 1953). Defining “alternative facts” as falsehoods further devalues the rhetorical currency of factual discourse. At an annual meeting of the National Communication Association, the author heard a famous rhetoric scholar proclaim, “Long live the post-truth age!” Against such post-modernist orthodoxy, I am arguing here for greater caution, and a strategic resuscitation of the true/false distinction.

Policy Implications and Conclusion

I agree with the authors of the open letter to AMNH, that the influence of climate change denialism on science museums should be a matter of concern for policy makers, but I wish I could go further to assert what they only suggested: Fossil fuel industries have an influence, not only on the perception of an institution as credible, but on the factual presentation of environmental issues. At least in this case, they are doing so, not by fabrication, but by incomplete arguments, missing evidential details and hinting at unwarranted conclusions. While I might wish to make such a claim, my ability to substantiate it is fatally hampered by a key informant who withdrew from the study. In conformity with the right of any research subject to withdraw consent to participate, I lack an evidential basis for such a strong claim, so instead, I will restate my more modest one: that HCIYA effectively minimizes health risks of pollution and the decisive role of fossil fuel combustion, and as such, is not incongruent with climate change denialist rhetoric (even if unintentionally). Perhaps research focused on overt climate change denialism misses why the political will to prevent environmental apocalypse seems lacking. Research might also focus on discursive and mediated constellations where dangers are minimized, loci of pollution misplaced, and loci of agency misdirected, leading to a superficial or misleading understanding of anthropogenic environmental threats.

Heidi Lawrence, Bernice Hausman and Clare Dannenberg note how local contexts necessarily influence decision making on globally framed issues (2014, 118). The HCIYA exhibit doesn't mention relevant details about the local electrical utility, nor the role of fossil fuel combustion in air pollution and climate change, nor does it suggest any policy response. Instead, an abstracted, individual end user of electricity is blamed. In her book about the ideological underpinnings of public health policy, Sylvia Noble Tesh (1988) cautions against making an individual the basic unit of analysis:

It supports a politically conservative predisposition to bracket off questions about

the structure of society—about the distribution of wealth and power, for example—and to concentrate instead on questions about the behavior of individuals within that (apparently fixed) structure (161).

I hope this paper makes a methodological contribution by converting visual and multimodal arguments into syllogistic ones, with missing premises or conclusions, allowing for the specification of what is inexplicit. Although the practical syllogism and enthymeme have been portrayed here as vehicles for flawed reasoning, I'm not suggesting they are used that way, primarily. But just as enthymemes contain unstated propositions, practical syllogisms contain unstated conclusions, making both vulnerable to faulty arguments. The audience is expected fill in the blanks, but may do so on the basis of hasty generalizations, or not at all. For instance, the inclusion of smokestack photos in HCIYA seems like an acknowledgement of the role of coal combustion, but without explicit text, the visitor may or may not make the connection. This finding suggests the potential inexactness of visual or multimodal arguments, to the extent they are verbally inexplicit.

The enthymeme is, to Aristotle, “the very body and substance of persuasion” (1932, 1) but the term is not that widely used in contemporary rhetorical scholarship: avoided, perhaps, because its definition is contested. Medieval commenters used a deficit model to define it, according to Carol Poster (1992). Boethius wrote, “An enthymeme is an imperfect syllogism, that is, discourse in which the precipitous conclusion is derived without all the propositions being laid down beforehand...” (quoted in Poster 1992, 20). More contemporary commentators reject the definition of an enthymeme as an abbreviated or imperfect syllogism, defining it more broadly as arguments based on probabilities, signs and emotions, unstated, because they are presumed to be obvious. Although the Boethius definition is no longer current, it seems apropos for purposes of this article, and our present, “post-factual” age. While the precipitous conclusion isn't always wrong, necessarily, it lacks the rigor of scientific demonstration. The enthymeme, and its cousin, the practical syllogism, offer health policy scholars a way of talking about the implied commands lurking behind reports, and the indirect directives entailed by a particular arrangement of partial truths.

Duncan Cameron, once director of the Brooklyn Museum, described science centers as “a claustrophobic maze of non-communication” with “an infinite number of buttons to push and cranks to turn” (quoted in Danilov 1982, 10-11). Instead, I would argue that, in addition to buttons and cranks, science exhibits can communicate effectively, prescribing a course of action and acting as a lever for redressing environmental injustices. In this case, however, what is being prescribed is quietism, amidst a smog of missing facts, unstated agendas, and counter-factual conclusions, remarkably recalcitrant to scientific consensus.

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Notes

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