The Role of Science in Reporting on Sweeteners

This analysis began by considering the role of scientific research as a driver of news. As it turned out, the news value that journalists assigned to the release of research findings was less than we expected. However, there are other roles that science has played in the debate over various sweeteners, which go well beyond providing news pegs. And what makes a particular study newsworthy is dependent upon many factors beyond the scope of this analysis.

Even when scientific research is not the reason for the story, it can be included in stories to ground reporting in the latest data. And over time, it can prompt journalistic interest in new areas or at least new information. Scientific evidence also finds its way into reporting when sources or reporters cite scientific results to bolster their judgments of sweeteners. Finally, science can enter into reporting through the use of expert sources from the scientific community.

It is important to note that in many stories it is difficult to identify what piece of research is being covered or referenced. Studies are almost never identified by the title of the journal article in which they appear. Sometimes a story will mention the journal where the research was published or the conference where it was released. In other cases the story will identify a lead author or the institution where the research was conducted. The end result is that a story has to be read carefully to sift out the necessary information about a piece of research. Even if one cannot identify a particular study, however, it is important to be able to identify enough information about the study to evaluate its findings and implications.

Reporting on Scientific Research

In our examination of reporting on caloric sweeteners, we identified every occasion where a relevant study was reported with any detail in the story. We omitted brief references like "studies show" or "there is research to suggest." This cataloguing of research studies was not restricted to the 11 pieces of research that formed our sample periods. Rather, we identified all studies that addressed any health concerns tied to caloric sweeteners. The purpose of this analysis was to determine how thoroughly reporters described the research and provided news consumers with the information necessary to assess the research.

To assess the details of reporting on scientific research, we identified a dozen pieces of information whose absence makes it more difficult for news consumers to make such judgments. The first six concern research design and execution. The others concern the interpretation of findings.

First, with regard to sample design, is there any information to identify the type of study that was being reported (i.e., laboratory animal testing, epidemiological research, meta-analysis)? Such information helps the reader to understand any inherent limitations

of the research design. Second, are there any discussions or mentions of the sample size in the study? Third, is there any information on how the sample was selected? Fourth, is there information on how the test subjects were exposed to the sweetener? Typically, the more the exposure method resembles normal human consumption, the more meaningful the results. Fifth, how much sweetener were subjects exposed to during the research? While high doses well beyond real life usage might be used in animal studies, such techniques can make interpretation more difficult. Sixth, did the research design use a control or comparison group? These six variables help readers or viewers understand how research was conducted so they can assess its quality.

The remaining pieces of information concern the assumptions that underlie interpretations of research findings. In addition to the results themselves, consumers need to know if research findings are significant or robust. This means providing (where appropriate) information about statistical significance and margin of error or confidence intervals. It is also crucial to know if the researchers claim to find a causal relationship or merely a possible linkage.

In addition, since scientific inquiry is a cumulative process where results build upon each other, we looked for attempts to put the current research in the context of work that has been done before. Finally, we asked where the research appeared (such as a peer reviewed journal or a professional conference), and who funded it (government, industry, private foundations etc.)

As can be seen in Table 9 reporting on scientific studies frequently leaves out much of this information, although the reporting was far more thorough on some details than on others.

Table 9
Reporting on Research Details

Identifying research design	**80%**
Sample Selection Method	**28%**
Sample Size	**62%**
Exposure Method	**68%**
Dosage Levels	**44%**
Use of a control/comparison group	**62%**
Statistical Significance	**16%**
Margin of Error	**0%**
Assertions of Causality	**7%**
Putting the Research in Context	**17%**
Source of Funding for Research	**14%**
Publication of Results	**43%**
Number of reports	**71**

Among the 71 study discussions that we identified, four out of five (80%) provided enough information to be able to identify the type of research design. In fact this was the

most frequently provided piece of information. Over three out of five (62%) reports on research included information on the sample size, but only 28 percent provided information on how the sample was selected.

Similarly, more than two thirds (68%) of reports included information on the method of exposure (usually a mention that test subjects were fed or drank a sweetener). But stories were far less likely to indicate, even in general terms, how much sweetener the research subjects consumed. Forty four percent of reports mentioned any sort of dosage level. Finally, among the details relating to research procedures, three out of five (62%) reports included a mention of the use of a control or comparison group in the research.

Details relating to the interpretation of findings were more difficult to come by. Readers or viewers would have to search hard to find any mentions of statistical significance (only one out of six reports or 16%), and error margins were never reported. Since scientific studies are also couched in cautious terms, we found, as we expected, only a few occasions where there were assertions of a causal relationship (seven percent). The media did a poor job of setting current research in the context of previous work, which occurred in only one out of six reports (17%) Only a minority of reports (43%) identified where the research results were released to the public, and only one out of seven (14%) identified the source of funding.

Finally, with each of the opinions identified on the health effects of caloric sweeteners, coders looked for any scientific evidence that sources marshaled to support their arguments. The results were disappointing for a debate over the health effects of caloric sweeteners. Out of 1,512 assertions about the effects of sweeteners, only 16 percent were supported by referring to scientific evidence. Most opinions were simply stated without attempts at substantiation.

It is also worth noting that, in the majority of cases (57%) where a source attempted to support an argument with scientific evidence, the reference was simply to unspecified research. Thus, between the missing details in reporting on research, and the very general nature of the evidence cited, it would be very difficult for a news consumer to form a coherent opinion about the health effects of sweeteners which they can seek to verify through other sources of information.

The Role of Experts

Although journalists were sometimes chary with the information needed to properly evaluate research finding, they were not shy about going to credentialed experts to supply such evaluations. At least in this context, scientific expertise played a prominent role in the debate over caloric sweeteners. Just over a quarter of all sources (26%) who expressed an opinion were identified as some type of academic expert. The remaining opinions came from an array of advocacy groups, government officials, industry representatives, reporters and the general public.

Among the experts cited, almost half (46%) were unnamed. This was the result of reports quoting study findings (e.g., "researchers at Princeton have found consumption of HFCS can cause obesity in rats") or using non-specific references like "experts say . . .". However, the majority of experts (54%) were identified by name, making it possible to track the most visible scientific experts in the media.

Table 10 enumerates the named experts, along with their qualifications as listed in news stories. While we counted 58 named experts, most appeared infrequently. Among named sources, the five most frequently quoted experts accounted for nearly half (43%) of named expert opinions on sweeteners. Thus, a small number of scientists exercised a relatively large influence over the reporting of expert opinion on sweeteners.

Not surprisingly, these go-to sources tended to have strong opinions on policy issues as well as of sweeteners, and they seek to influence a much wider audience than their scientific peers. For example, Robert Lustig has argued[4] that sugar should be regulated like alcohol and tobacco. He is best known for his lecture "Sugar: The Bitter Truth," which has been viewed over three million times on YouTube, in which he described sugar as "evil" and a "poison."

Barry Popkin[5] describes himself as an activist who "works with governments to make changes." He argues that his "activist background has given me a special perspective on nutrition," informing his efforts to tax sugared beverages and junk food in New York.

David Ludwig has argued for restructuring government farm subsidies and is involved in efforts to restrict food advertising directed at young children. Kelly Brownell is also a prominent proponent of both soda taxes and food taxes.

Walter Willett has argued[6] publicly that, "Children are being exploited [by food marketers], same as sweatshops," which he calls "a natural consequence of a capitalist food supply."

Table 10
Experts Cited in the Sweetener Debate

Name	*Affiliation*	*# Opinions*
Lustig, Robert H.	**Pediatric endocrinologist, Univ CA San Francisco**	**21**
Popkin, Barry	**UNC Gillings School of Global Public Health**	**20**
Ludwig, David	**Harvard endocrinologist, Children's Hospital in Boston**	**19**
Brownell, Kelly	**Nutritionist, Dir Yale's Rudd Center Food Policy + Obesity**	**16**
Willett, Walter	**Chmn Nutrition Dept. Harvard Sch Public Health**	**15**
Hu, Frank	**Prof nutrition + epidemiology Harvard Sch Public Health**	**9**

[4] http://www.nytimes.com/2011/04/17/magazine/mag-17Sugar-t.html?pagewanted=all&_r=3&
[5] http://onwisconsin.uwalumni.com/features/leading-the-war-on-obesity/
[6] http://medicalxpress.com/news/2013-09-whys-obesity.html

Purnell, Jonathan	**endocrinologist Oregon Health & Science Univ**	**8**
Dawson, Todd	**plant biologist at Univ. of California - Berkeley**	**6**
Kessler, David A.	**Former F.D.A. commissioner**	**6**
Sherwin, Robert S.	**Prof of medicine at Yale University School of Med**	**6**
Catanzaro, Rose	**Dietitian St. Louis University School of Medicine**	**5**
Malik, Vasanti	**Nutrition researcher Harvard School of Public Health**	**5**
Bray,George	**Pennington Biomedical Research Center, Louisiana State University**	**4**
Caprio, Sonia	**Prof. Pediatric Endocrinology, Yale Sch. Of Medicine**	**4**
Julia, Ross	**Author of Mill Valley Recovery System**	**4**
Weil, Andrew	**Dir. Arizona Center for Integrative Medicine at the Univ. Arizona**	**4**
Crawford, Patricia	**Center for Weight and Health, UC Berkeley**	**3**
Christensen, Larry	**Psychologist, University of South Alabama in Mobile**	**3**
Edwards, Denise	**Dir. Univ. South Florida Healthy Weight Clinic**	**3**
Nestle, Marion	**Professor of Nutrition, Food Studies, and Public Health at New York University**	**3**
Rimm, Eric	**Assoc. Prof. Epidemiology & Nutrition at the Harvard School of Public Health**	**3**
Story, Mary	**Prof of nutrition Univ. of MN School of Public Health**	**3**
Bocarsly, Miriam E.	**Princeton University**	**2**
Choi, Hyon	**Prof. medicine Boston Univ. School of Medicine**	**2**
Haub, Mark	**Professor of Nutrition, Kansas State Univ.**	**2**
Laffer, Cheryl	**Assoc prof. Texas A&M Health Science Center College of Medicine**	**2**
Mechanick, Joseph	**Prof. Mt. Sinai School of Medicine**	**2**
Roizen, Mike	**Chief medical officer Cleveland Clinic Wellness Inst.**	**2**
Wang, Gene-Jack	**Brookhaven National Laboratory**	**2**
Agatston, Dr. Arthur	**Miami Cardiologist, author of South Beach Diet**	**1**
Allison, David	**Biostatistician, Univ. Alalbama Birmingham**	**1**
Banschbach, Martha	**Professor Biochemistry Ohio State Univ.**	**1**
Bonci, Leslie	**Dir. sports nutrition Univ. Pittsburgh Medical Ctr.**	**1**
Campbell, T. Colin	**Nutritionist at Cornell University**	**1**
Campbell, Wayne	**Professor, Dept Foods & Nutrition Purdue Univ.**	**1**
Chonchol, Michel	**Prof. Nephrology, Univ. of Colorado**	**1**
Farley, Thomas	**New York City Health Commissioner**	**1**
French, Simone	**Prof. Epidemiology, Univ. of Minnesota**	**1**
Goldberg, Nieca	**Joan Tisch Center for Women`s Health at NYU`s Langone Medical Center**	**1**
Goran, Michael I.	**Prof. preventive medicine Keck School Medicine, USC**	**1**

Havel, Peter	**Professor Dept. of nutrition Univ. California Davis**	**1**
Hirsh, Jules	**Researcher at Rockefeller Univ.**	**1**
Holcombe, Randall	**Oncologist, Mt Sinai Hospital.**	**1**
Jacques, Paul	**Friedman Sch. Nutrition Science & Policy, Tufts Univ.**	**1**
Johnson, Rachel	**Prof. nutrition, University of Vermont**	**1**
Katan, Martijn B.	**Emeritus professor nutrition Univ. Amsterdam**	**1**
Leibel, Rudy	**Obesity researcher at Columbia University**	**1**
McKeown, Nicola	**Nutritional Epidemiology Prog. USDA Human Nutrition Research Center on Aging**	**1**
Newman, Vicky	**UC San Diego Cancer Prevention & Control Prog.**	**1**
Paarlberg, Robert	**Wellesley College**	**1**
Piernas, Carmen	**Univ. North Carolina Chapel Hill, Gillings School Global Public Health**	**1**
Sawka, Michael	**Prof. applied physiology, Georgia Tech**	**1**
Seeram, Navindra	**Researcher, University of Rhode Island**	**1**
Sorenson, Marc	**Phd from BYU**	**1**
Sprat, Susan	**Endocrinologist, Duke Univ.**	**1**
Zive, Michelle Murphy	**Registered dietitian, Exec. Dir. Network for Healthy California, UC San Diego**	**1**

Finally, we asked whether the experts who were cited supported their opinions by referencing the accumulated knowledge of their fields. Of the 388 opinions attributed to some type of expert, 42% were bolstered by citing scientific evidence. Expert citations of science, however, were likely to be vague or unspecified references. Almost three out of five (58%) expert citations of science were unspecified in nature.

Of course, these may be the summary statements from longer interviews that were favored by journalists looking for a pithy quote. Whatever the reason, however, scientific opinion in the news often stood on its own authority, with only a minority of experts pointing news consumers toward any evidence (e.g., a particular study) that underlay the opinion they were expressing.