

Where do you get your information from?

Time and again what holds students back is inaccurate information. Inaccurate information comes from unreliable sources, and it is these we must avoid.

On NHA we like to use research that has the highest probability of being genuine. We talk a lot about this in 'newbies', but repeatedly students will quote research from commercial or mainstream media sites that are not reliable sources of info. To make it clear:

Newspapers and magazines are NOT reliable sources of info.

TV Networks eg Fox News, CBC, BBC etc are NOT reliable sources of info.

Books full of hypotheses without any references to science papers are NOT reliable sources of info.

Self-help sites and product-marketing sites are NOT reliable sources of info.

Well-meaning friends who 'read it somewhere' are NOT reliable sources of info.

The info we seek is the research results and data presented by the scientists doing the actual research. We still need to question the authors' personal conclusions on the research, and we need not necessarily use the information for the same purposes. For example, plenty of medications designed for one thing have been found useful for other, entirely unrelated things; such as the antibiotic Anisomycin, which can also help to block traumatic memories.

What follows are four reports on science reporting, aiming to focus our perspective on the reliability of information, and why we should make a habit of thinking like 'Sherlock Holmes' and questioning the origins of everything we read or hear.

Article 1

Are Sugary Drinks Fattening? Depends Who You Ask

By NICHOLAS BAKALAR Industry-funded studies on the connection between sugar-sweetened beverages and obesity are likely to be biased in favor of industry

- In studies without industry support, 83 percent linked sugary beverages with weight gain
- In studies with industry support, 83 percent found no link between sugar-sweetened beverages and weight gain
- 77 percent of food items in US grocery stores contain added sugar that is addictive and linked to chronic disease when consumed in excess

Are there good scientific studies that show that drinking sugar-sweetened soda increases the risk for obesity? The answer may vary depending on who is paying for the study.

Researchers examined 17 large reviews of the subject (one review assessed results for adults and children separately, so there were 18 sets of study conclusions). Six of the studies reported receiving funds from industry groups, including Coca-Cola, PepsiCo, the American Beverage Association and others. The other 12 reviews claimed no conflicts of interest. The analysis appears in the December issue of PLOS Medicine.

Among the reviews with no conflicts of interest, 10 of 12, or 83.3 percent, reported that sugary drinks were directly associated with weight gain or obesity. The conclusions of studies supported by industry were a mirror image: five of six - the same 83.3 percent - reported that there was insufficient evidence to draw a conclusion.

The lead author, Maira Bes-Rastrollo, a professor of preventive medicine at the University of Navarra in Spain, said, "I think that the general public and the scientific community should be aware that the food industry has vested interests that may influence their conclusions." Article 2

<http://blogs.scientificamerican.com/scicurious-brain/2012/04/18/small-terms-make-a-big-difference-how-the-ny-times-misinterpreted-a-new-cocaine-study/>

Small terms make a big difference: how the NY Times misinterpreted a new cocaine study

Dr. Becca, author of the blog 'Fumbling Toward Tenure'.

Last week, the New York Times' "Well" section ran a piece titled, "How Exercise Can Prime the Brain for Addiction." Scary, right? One minute you're cruising along on the treadmill, and next thing you know, you're ADDICTED TO COCAINE. Hovering over the web page tab header, however, reveals what may have been the original title -the more qualified, but less provocative "How Exercise May Make Addictions Better, or Worse."

Ironically, it's the cutting-room-floor version of the title that more accurately (but only marginally so) reflects the findings of Mustroph et al (2012), an Illinois-based research group who studied the influence of exercise on the learning processes associated with drug use. In a

nutshell, the researchers showed that the timing of exercise and drug exposure mattered: animals that exercised after getting a few injections of cocaine had an easier time “letting go” of their drug-associated cues than animals that exercised before cocaine exposure did. What Mustroph et al were not studying, though, was addiction -and this is only the beginning of where NYT writer Gretchen Reynolds does a disappointingly poor job of science reporting.

This paper is about learning. With every experience we have, we learn something about the circumstances in which that experience occurred, and experience with drugs is no different. If you always do drugs in a certain room of your house, or at one particular club, you’re going to start associating those places with the drug, and, in all likelihood, with the way the drug makes you feel. You might even enjoy hanging out in those places when you’re not using the drug, because of the positive associations you’ve formed. This is the idea behind Conditioned Place Preference (CPP), a common test of context-drug associations in animals. An animal that experiences cocaine in one environment will choose to spend time in that environment later on, even if its system is drug free at the time. But as Reynolds describes it, “If a rodent returns to and stubbornly plants itself in a particular place where it has received a drug or other pleasurable experience, then the researchers conclude that the animal has become habituated.” She goes on, “All of the mice had, essentially, become addicts.”

A couple of things are wrong here. 1) Why are we calling the mice “stubborn?” This anthropomorphizing is not actually reflective of cocaine-treated animals’ behavior in CPP, and is totally unnecessary for the purposes of the article. 2) “Habituated?” I do not think it means what you think it means. In behavioral neuroscience, “habituation” usually refers to the way in which an animal can get used to a certain environment—much like how you sleep better after a couple of nights in a new home. Here Reynolds appears to be confusing the process of acclimating the mice to the testing environment before the experiment begins with that of the actual testing. 3) What a preference for the location previously associated with cocaine demonstrates is exactly that—the mouse understands the association. That mouse is, in no possible definition of the word, an “addict.”

So then, what does it mean to be addicted to a drug? The

DSM-IV criteria

are easy enough to consult, and I can't anywhere in there find the part where having four injections of cocaine makes you an addict. And yet, Reynolds refers to "cocaine-addicted mice" or the animals' "addiction" over and over again throughout the article, when she just as easily could have said "cocaine-treated mice" or something similarly more accurate.

There are other inaccuracies, too; most egregious in my mind is a reference to the process of extinction as "forgetting." In extinction, repeated exposure to the cues or contexts in the absence of the drug teaches the animal that it can't expect drug in that environment anymore, and the animal will stop showing place preference. But as any recovering drug abuser will tell you (and as can be demonstrated in animals as well), the memories for a drug and its related cues are never forgotten—this is what makes relapses, or "falling off the wagon" so common. Instead, the animal learns that the predictive value of the environment has changed, and its behavior changes accordingly. This is a critical point of the study itself—the primary difference between experimental groups is in the way they learn to extinguish—and yet the significance of this finding gets lost in translation.

Now, why am I getting my panties in a twist over a couple of misappropriated scientific terms? Because people are smarter than this! Without interviewing both Ms. Reynolds and the study's primary authors, it's hard to know whether Reynolds did a bad job interpreting the science, or if the authors or public relations office "dumbed it down" for the journalist in a way that misrepresented their actual work (or a muddy combination of the two). But neither scientists nor science writers should shy away from telling the public what science is really about—and what the true implications of a given study may be, however less exciting they seem.

Do researchers want the public to find their work interesting? Yes! Do writers want people to read their articles? Naturally! But the people who read this article may have come away with the impression that exercising could make them more likely to become a cocaine addict, which is not at all the case. When scientific findings are overstated, oversimplified, or misinterpreted, neither the public nor scientists benefit.

Again, this paper was not about addiction, but learning—a distinction I'm willing to bet the average newspaper reader is able to make. So why was that so hard for the NYT to convey?

Mustroph, M., Stobaugh, D., Miller, D., DeYoung, E., & Rhodes, J. (2011). Wheel running can accelerate or delay extinction of conditioned place preference for cocaine in male C57BL/6J mice, depending on timing of wheel access

European Journal of Neuroscience, 34

(7), 1161-1169 DOI:

[10.1111/j.1460-9568.2011.07828.x](https://doi.org/10.1111/j.1460-9568.2011.07828.x)

Article 3

The blogger Neurobonkers gives the low down on a new report

showing how the mainstream media misrepresent neuroscience findings to push their own ideological agendas:

<http://neurobonkers.com/2012/04/26/new-paper-slams-uk-media-for-routinely-misrepresenting-neuroscience-research-to-further-ideological-agendas/>

A paper published today in the journal *Neuron* describes how the mainstream media (specifically the *Daily Telegraph*

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and the Guardian

) have tackled the topic of neuroscience over the past decade. The paper is a damning indictment of how the press use neuroscience as a tool with which to “portray themselves as dispassionate” whilst preaching their trademark prejudices.

The pa

per describes how the

Telegraph

used research to wrongly “assert that productive female participation in both the labor market and family life is neurobiologically impossible”, while the

Daily Mail

miscellaneous linked “women to irrationality” (amongst countless other crimes) and the

Times

absurdly squealed “are gays dopamine junkies?”. The paper lists a labyrinth of logical fallacies which the media use to misrepresent neuroscience, repeatedly highlighting a tendency for:

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overextensions of research, with implications drawn far outside the original research context. This overextrapolation of research was not limited to idle speculation but sometimes extended to calls for concrete applications.”

The paper assessed the contents of nearly 3,000 articles involving neuroscience over the past decade to see which topics came up most. It’s not hard to see how the data is skewed by the media’s recent obsessions such as fish oil and narcotics. I’ve tossed the figures in to

[Manyeyes](#);

to make the information a little easier to digest:

Subjects Addressed within Media Coverage of Neuroscience

(2000-2010) The paper concludes that the media has used neuroscience research

“applied out of context to create dramatic headlines, push thinly disguised ideological arguments, or support particular policy agendas”

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urobonkers writes:

Fighting this tidal wave is the precise reason that I started this blog. For regular readers none of this will come as a surprise. I've previously described how the media has misrepresented everything from social networking and love to vaccination, drugs, and cognitive enhancement. I must admit that I find this issue so distressing that I have been left with the unfortunate tenancy to generally rant on the topic uncontrollably.

Reference:

O'Connor, C., Rees, G., & Joffe, H. (2012). Neuroscience in the Public Sphere

Neuron, 74

(2), 220-226 DOI:

[10.1016/j.neuron.2012.04.004](https://doi.org/10.1016/j.neuron.2012.04.004)

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[PDF](#)

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Article 4

<http://blogs.scientificamerican.com/observations/2012/05/04/study-documents-popular-press-distortions-of-neuroscience/>

Neuroscience Coverage: Media Distorts, Bloggers Rule

By Gary Stix

"Superwoman has been rumbled," declared a Daily Telegraph article in 2001 that chronicled how the human brain's inability to "multitask" undercuts the prospects for a woman to juggle career and family with

any measure of success. The brain as media icon has emerged repeatedly in recent years as new imaging techniques have proliferated—and, as a symbol, it seems to confuse as much as enlighten.

The steady flow of new studies that purport to reduce human nature to a series of illuminated blobs on scanner images have fostered the illusion that a nouveau biological determinism has arrived. More often than not, a “neurobiological correlate”—tying together brain activity with a behavioral attribute (love, pain, aggression)—supplies the basis for a journal publication that translates instantly into a newspaper headline. The link between blob and behavior conveys an aura of verisimilitude that often proves overly seductive to the reporter hard up to fill a health or science quota. A community of neuroscience bloggers, meanwhile, has taken on the responsibility of rectifying some of these misinterpretations.

A study published last week by University College of London researchers—“Neuroscience in the Public Sphere”—tried to imbue this trend with more substance by quantifying and formally characterizing it. “Brain-based information possesses rhetorical power,” the investigators note. “Logically irrelevant neuroscience information [the result of the multitude of correlations that turn up] imbues an argument with authoritative, scientific credibility.”

The authors conclude that, though it was impossible to determine precisely how the original studies and the media coverage diverged, their analysis confirmed that “research was being applied out of context to create dramatic headlines, push thinly disguised ideological arguments, or support particular policy agendas.” The study ends with an entreaty that researchers should come forward at the time of publication to elucidate ways in which their work could be misused “as a vehicle for espousing particular values, ideologies or social divisions”—and to ensure that policy debates surrounding neuroscience remain substantive and bereft of rhetorical fluff. The study pinpoints an undeniable tendency toward neurohype. But the bigger

picture transcends the oversimplifying that occurs in the popular media. For the truly interested amateur brain buff, more information—more good (and free) information—exists today than at any point since Santiago Ramón y Cajal penned his stunning line drawings of neurons.

In fact, there has never been a better time for the brain aficionado. The best among the contingent of expert bloggers that read and critique the neuroscience literature approximates a cadre of investigative reporters armed with PhDs in psychology and physiology.

Scientific American's

own Scicurious penned

[a blog on May 2](#)

that describes how a study on high-fat diets and depression that received coverage in the general media could have been much better than it was.

This isn't an advertisement for ourselves. There are plenty of others worthy of mention who do not count in the

Scientific American

stable of bloggers. And the combing of the literature for what's important is another service to be had for nothing more than the price of a monthly Internet IP provider. I found "Neuroscience in the Public Sphere" after reading Neurobonkers, an anonymous freelance science writer who flagged the study in a blog. Outside (or maybe even inside) of a graduate-school seminar, this kind of information is really hard to come by. (Also this just in for neurophiles: the giga site,

[BrainFacts.org](#)

—a joint venture of the Kavli Institute, the Gatsby Charitable Foundation and the Society for Neuroscience— a repository for all things brain.)

Quibbles abound from the standpoint of journalistic convention: some neuro bloggers remain behind the wall of a pseudonym. And, of course, the question can be asked about whether you can trust the

bona fides

of any given writer who hangs out a cyber shingle. But the same sort of query, as the University College of London researchers point out, can be directed in spades toward the

Daily Mail

or

The Times

. And, if you're asking for my vote on who to trust for a verdict on Super Woman and brain games, I'd pick Scicurious and Neuroskeptic any day.

We'd like to end with a bit of humor:

<https://www.youtube.com/watch?v=5eBT6OSr1TI>