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Carbonated Drinks Effect on Teeth

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Abstract

This paper was written during the summer of 2021 in which temperatures were soaring into the low 100's daily. There was high demand for dehydration at the time and so as with anything in excess, new pathways of that method develop. One of the most common alternatives to water are carbonated drinks such as sparkling water. Sparkling water has a great appeal because its clear liquid denotes a nutritious drink and the nutrition itself results in a tasty drink. However, one might notice that after consumption of these drinks result a starchy feeling in the teeth, like the condition that soda leaves its users after consumption. The prompted theory behind these feelings is that something harmful is occurring in the mouth. Initial research was performed to find that there was not a clear consensus (at the time) on whether these drinks were indeed harmful to the human tooth. Research was performed in which a scientific article and journalistic report of that article were compared for differences in presentation of the evidence and propositions. This paper demonstrates the contrast in which professionals and the media report scientific findings, and points to the issue of how audiences are vulnerable to be mislead through the interpretation of the media. All-the-while, the author demonstrates analysis of the rhetoric that is used to portray the science while showcasing the ability to understand major-related subject matter with ease.

Introduction

During the hot summer days, it is vital that cold beverages are available for much need consumption to quench any thirst. There are many potential beverage types to choose from. Water is great choice, but it has no flavor. Soft drinks have plenty of flavor, but the sugar concentrations are not very diet friendly. Beer is an option, but this paralyzes functionality and prompts legal issues. Perhaps the best compromise between these parameters is sparkling water. These sizzling beverages are healthy, delicious, and budget-friendly. Such attributes have prompted this drink to popularity in recent years, with a variety of well-known brands shelved at every street corner. It should be considered that sometimes the crowd is headed in the wrong direction, and that could be the case with this drink. Consumption of these drinks, while taste-friendly, leave an uncomfortable feeling in the mouth, specifically the teeth which are left feeling more viscous than before. Google usually has the answers to everything, especially with "simple" topics such as this one. But after a quick search, there appears to be no public knowledge of whether this uncomfortable feeling is indeed due to a harmful occurrence. Search engines usually come up empty handed when there are conflicting theories on a subject. Scientific research is continuously performed on relative subjects such as this but is not read by most readers through the source itself. The media serves as translator in public eye and is tasked with untangling lengthy scientific articles and transforming them into newspaper columns. A translation of such nature is analyzed by a third party to provide information to the reader to make a fair judgement as to whether the information was presented in a clear but accurate manner.

The Chicago Tribune is a well-known newspaper that millions of users read, so exposure of this topic through this particular source has great potential in influencing the public in a certain way. According to the Ellie Krieger of the Tribune, flavored waters are damaging our pearly whites and are sending out paychecks straight to out local dentist. While her explanation of such phenomena kept the science to a minimum, she did cite a study that was performed and presented by personnel that perhaps have a little more chemistry experience under their belt. The International Journal of Pediatric Dentistry performed a

study in which they analyzed the pH, titratable acidity, and erosive potential for 11 different flavored sparkling waters from a common marketplace in the UK. Their findings will make consumers think twice about their summer drinks and brush their teeth extra good.

At University of Birmingham's (UK) School of Dentistry in 2007, tests were performed by Brown and co. that aimed to answer some questions that could have significant implications on consumers health if a certain set of results were to be produced. It was Krieger's job to get a non-scientific audience to engage with such research, at task that required her to add some flavor the article. To from this bridge of interest, Krieger defaults to using pathos to engage her audience in the introduction, that being the first two paragraphs. While many scientific articles are cut and dry because they work under the assumption that the reader is already interested in the subject if they have enough familiarity with the subject to proficiently read such results-based content, journalistic presentation of such findings are often, in this case especially, prompted to real their readers into the subject through making its relevance noted. Krieger of the Chicago Tribune could not open her article by mentioning the most critical factors that determine the corrosiveness of a drink, rather she must and did rely on the referring to the feeling that such findings are relative to. This was evident and obvious in the very first sentence in which she refrains from referring to sparkling water as its universally recognized name: sparkling water, and instead uses the label "flavored water" as it is more enticing with regards to effects on the user's taste buds through simple, sub-conscious imagination. Such use of an early synonym could potentially mislead the audience into interpreting what "flavored water" is meant by in this context with the title being "Sparkling waters..." as a possible differentiation between the two could be assumed. This is a textbook example of what the Knowing Words article was referring to in the composition of rhetoric, where there was an *audience* that Krieger analyzed and predicted to be potentially interested in sparkling water drinks and subsequently their flavor, and the *purpose* of engaging the audience with thoughts that reaggravate such feelings (taste) (University of Colorado Boulder, 12). It is important to understand that the taste of sparkling water beverages is the one of the biggest incentives for buying this drink and challenging the significance of the cited research. The cited research takes an opposite approach to presenting the findings, where such rhetoric that promotes the flavor of these drinks are ignored so the findings can be viewed through a statistical, non-biased viewpoint. It is certainly possible that the Krieger was setting up the audience to challenge these findings by putting them in a position to where they would knowingly miss out on the benefits of these beverages if the hypothesis came to fruition.

After the first two paragraphs of emotion appeals about the deliciousness and flavor of sparkling water, Krieger begins to discuss whether these sparkling water beverages are indeed harmful for one's tooth enamel. The first mention of any type of assertion towards a claim regarding this subject was done so in the 3rd paragraph where Krieger states "The problem is that these drinks' flavor essences, mostly citric and other fruit acids, cause significant tooth erosion" (Krieger). Wording is key in this context and Krieger elects to describe the findings as significant, implying a wide array of potential outcomes due to the lack of specificity that this adjective denotes in this given context. Perhaps such wording was used to question the extent of results and therefore create intrigue in the audiences' mind, but it should be viewed a lack of preciseness that could have consequences such as potential misinterpretation amongst readers with regards to the extent of these mentioned effects. Significant in this use can range anywhere from a nano-stain to complete destruction of a tooth's core. This cloudy description is followed by a clarification from a Dentistry Professor from UCLA "the incremental dissolving away of the

enamel on the teeth, which, over time, can affect their structural integrity, making them hypersensitive to temperature and potentially more cavity-prone” (Krieger) (Hewlett). While this clarification does not pin down Krieger’s initial cloudy assertion, it does give the audience more of an ideal before the actual results are introduced from 2007 article. Krieger intentionally confused the audience briefly by describing the outcome in an in-precise fashion to prompt engagement and intrigue towards what the actual extent of the tooth damage is.

Krieger then goes on to discuss the main, or what should be stated as the main characteristic of drinks that determines the corrosive potential on human teeth enamel. Within this discussion, Krieger uses manipulative and contradictory phrasing to state an unverified fact and then continue with an assumption under the basis of that “fact” for the sake of simplicity and efficiency. She discusses how the pH of a beverage is the “main determinant of this potential to erode teeth,” a science-based assertion that is likely above her qualifications, followed with the assumption that “anything (any drink) with a pH of less than 4 is considered a threat to dental health” (Krieger). For such cause-and-effect relationship to be established, the extent to which pH is the main determinant of a drink’s corrosive potential must be appropriately cited and explained. Such boundaries are necessary because her original wording implies that the pH could be anywhere from 1 – 99 percent of what determines a drinks corrosiveness pending the other unmentioned factors. While simplicity and efficiency are important for a journalistic approach to writing about such a subject, it is necessary to establish a fundamental basis in such context with perhaps a credible source since this science is not everyday knowledge amongst its readers, and certainly not to her.

While Krieger is undeniably wishy-washy in her presentation of science-based assertions, the scholarly article itself was relatively confident and simplistic in their findings. Statements made by the school of Dentistry were mostly presented in a stage 3 manner in that the numbers correlating to the subjects were themselves concrete but were tagged as being the products of other organization’s research, denying them of the stage 4 label. “A recent study” and phrases such as “found that” or “reported that” were used to ensure a formidable but not undeniable level of certainty attached to these statements (Brown). The writing backhandedly acknowledges this lack of uncertainty by pile dumping these statistics containing such phrases that all pertain to the same manner. Still, it is noticeable between the journalistic and scholarly presentations of the level of certainty that is used throughout the writings. It should be noted that a large cause of this lack of clarification and certainty within the journalistic writing is largely due to the required efficiency that must be executed for the audience to be continuously engaged, whereas the scholarly article has no such obligations and is free to go into the necessary amount of depth to present a clear and accurate depiction.

Evidence of scientific accommodation in this article first includes the explanation of the why the pH levels for different drinks in the provided context are what they are. Krieger mentions briefly that carbonating a beverage is the process of adding carbonic acid which lowers the pH levels of the initial substance (Krieger). Again, the importance of conciseness and efficiency is undeniable from a journalistic approach to presenting these findings, but such information must be followed up with specifics such as how much carbonic acid does a particular drink of interest proportionally receive and whether these concentrations do/don’t differ amongst common carbonated beverages. (This is of course working under the assumption that her assertion regarding carbonic acid is even true, as in fact carbonic acid is the product of adding carbon dioxide to water.) This lack of information is evidently due to a lack of scientific background on behalf of the author but should still be brought into discussion

otherwise the readers are prone to continue reading with a level of uncertainty if they asked themselves such questions which in that case would hurt this article's credibility and trustworthiness. The audience is aware of her lack of experience towards the subject and that any evidence presented outside of citations is purely superficial, but it is necessary that a journalist educate herself on the subject to an extent that allows her to present her findings in an adequate fashion.

Regardless, her attempt to contextualize the situation was effective as the necessary basis was provided for her audience to interpret the results of Brown and company's findings so that conclusions could be drawn. pH levels are measurements that are referred to throughout both the scientific and scholarly articles in which Krieger only briefly describes to be a measure of acidity. Coupled with her unfound assumption from earlier regarding the relationship between pH and corrosive potential, this is an appropriate way to explain this subject especially with the consideration that she presents the pH data of each drink relative to another drink, giving an adequate depiction of the necessary science to interpret the information being insinuated. This is a case where a journalist can (and did) get away with simplifying, brazing over the science to focus the non-scientific audience on the results. Because while the science is important, the audience of the journalistic article is only interested in the results/conclusions so only an adequate discussion of the "how" should be discussed. This is further elaborated in Fahnestock's writing, "Accommodating Science," in which she discusses how "there is not room for the qualifications a more knowledgeable audience would demand" (Fahnestock, 338). This was in reference to a simplification of scientific context on behalf of a journalist towards a scientific article.

Scholarly and Journalistic articles based on the same subject differ evidently in their respective presentations due to different purposes which are the cause of different articles. While the scientist/researcher gets the opportunity to go more in depth towards the subject and therefore make more assertive and stable claims, the journalist is kept on a tight leash in purpose of keeping the audience engaged. Despite the different styles and methods used by the writers, the purpose remains the same and that is to inform an audience regarding the subject matter that they view as important. Had Krieger been provided a more attention devoting audience, the journalistic product might have seemed that much more scientific. While this is just a hypothetical, it is crucial to see from this analysis the extent to which the audience writes the article so much as the writer themselves.

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