

Styling Science for the Web*

By Corazon D. Villareal

Abstract

This paper tracks the movement of scientific studies as they are translated from an academic register to an accessible style in the web. The corpus is derived from actual articles that have been posted in a university website and subsequently, in a regional website, the ResearchSEA. It documents various stages in the process, particularly the adjustments in vocabulary, syntax, and tone, to suit the style to website browsers. It shows the need for close coordination among the writer, researcher, illustrator, and editor to come up with an article written in a layman's style, yet faithful to scientific content.

The documentation reveals important differences in style between the scientific and the popular, but demonstrates as well how style changes with the shift in medium.

*Paper presented at the International Conference of the Poetics and Linguistics Association, Osaka, Japan, July 31-Aug.4, 2007

Scientific discourse is generally characterized as dispassionate and impartial--in keeping with the objectivity that scientific inquiry is supposed to be conducted. Moreover, scientific discourse, is often considered as the purview of experts. Habermas traces these characteristics of objectivity and specialization to the falling apart of unified world-views of religion and metaphysics that had characterized the medieval and the Renaissance periods in the West. By the 18th century, it had been customary to break down substantive reason into the three autonomous spheres of science, morality, and art. To quote from Habermas: "Each domain of culture could be made to correspond to cultural professions in which problems could be dealt with as the concern of special experts." It was the project of the so-called Enlightenment to break these "esoteric forms" and utilize their "cognitive potentials" to enhance everyday life. However, our experience in the 20th century has shown that the cleavage between these specialized cultures and everyday praxis, persists and the Enlightenment project is far from completed.

The split has ideological underpinnings. As defined by Gee (104), ideology is any theory dealing with the distribution of "goods," these being status and solidarity; these recall Bourdieu's concept of cultural capital. Myers (cited by J. Parkinson, *et al* 380) shows that writers of research articles take pains to conform to expectations of the community of scholars in order to enjoy these "goods", among which are adoption of their research claims, citation of the research articles (ISI accreditation, for instance, is based on citations by scholars), and funding support.

It is in the context of bridging the split between knowledge and everyday life that attempts at popularizing science must be viewed. Popularization essentially means the *debunking of the objective as stance*, the "professionalized detachment" that has come to be associated with scientific approaches, although this should not be mistaken for the throwing away of accuracy and non-manipulative interpretation of results. Popularization also means *breaking out from the enclaves of the lab and the tone of gravity in academic reports and scientific journal articles* in order to reach out to the community-at-large.

As Director for Research Dissemination and Utilization at the University of the Philippines, at Diliman, I have seen first hand manifestations of this cleavage in the scientific community. Many completed research projects remain archived, or if published, they appear in esoteric scientific journals accessible only to fellow scientists. Significant research and technology remain in the lab and the community-at-large is deprived of the benefits of technology transfer that could result from partnerships between science and business. Through the help of various collaborators, my office has been working on a number of interventions to narrow this gap, among which are keeping up to date the publication of *Science Diliman*, an internationally refereed journal that comes out twice a year; the publication of its abstracts of all issues and full-length online articles (except for the most recent two issues); to expand the reach of the journal, a subscription has been made with ResearchSEA, a website dedicated to journalists worldwide. Apart from financial and administrative support for patent applications, the office is at the forefront of efforts by the OVCRD to hasten technology transfer. The

University of the Philippines has produced 25 out of the 30 National Scientists in the country and even younger scientists in the University have gained international recognition. Yet, as Dr. Cynthia Palmes-Saloma, one of the country's leading marine biologists, very few have had the time to link up with the business community.

The corpus of this paper comes from two articles in the *Research Folio*, an electronic newsletter, which we put online since June 2006. The paper aims to demonstrate how the web writer and collaborators attempt to bridge the gap between the scientific and the lay communities. (Please check the website of the OVCD, UP Diliman: <http://www.ovcrd.up.edu.ph>).

The Research Folio (henceforth to be referred to as *the Folio*) had come out in print in the late nineties to present research highlights in the University. But the issues were intermittent, about three staff members worked on it at the same time, circulation was limited, and a regular budget had to be allocated to it. The decision to go online was done primarily to widen access to research in UP both nationally and internationally, a need which limited print copies simply could not meet. Also, since a printed newsletter depended on a full staff and was costly, it could not appear regularly. Now, the *Folio* covers research events in the University but its mainstay is at least two articles a month based on University –sponsored research projects, whether completed or on-going. The primary source is the terminal reports or publications submitted by its faculty for research grants funded mainly by the University, although on-going “hot topics” may also be covered. Research from all disciplines is featured in the Folio, but for this paper, only articles on science are discussed. The target browser is not the specialist but the layman.

Specifically, this paper is concerned with the question: “What strategies are involved in crossing from an academic/scientific register to a popular one?” Two case studies shall be discussed:

1. “*Bagoong: Good for the Brain*” (Vol. No. April 2007) which is based on the article entitled “Polyunsaturated fatty acid contents of some traditional fish and shrimp paste condiments of the Philippines” by Drs. Nemesio Montano, Grace Gavino and Victor C. Gavino. This appeared in *Food Chemistry* 75 (2001) 155-158.
2. “Breathing Manila” (Vol. No. Month) which is based on a study entitled “Air Pollutant Characterization and Source Identification of a Selected Metro Manila Sampling Site.” The latter was a commissioned project completed by Dr. Leni L. Quirit. Of the Institute of Chemistry, UP. Diliman, and the Analytical measurements Research Unit, Philippine Nuclear Research Institute, UP, Diliman.

Close collaboration is maintained from the beginning with our Melissa R. Parreno, university researcher and web writer. The sources are the research grant files in the OVCRD, but care is given so as the various disciplines in the natural sciences cluster are duly represented. A written permission to feature the research project is solicited

early on from the author, but s/he is consulted throughout the writing process especially with regard to very technical parts not within the comprehension of the writer (who has a Statistics background). The author also has to approve the final version before it is posted in the website.

The Journal vis-a-vis the Web. It would be difficult to trace the sequencing of steps since writing is a recursive and not a linear process. It is important to note though that an article finally posted has gone through a number of drafts. A fruitful way to understand what are involved in the crossing would be to compare the web article with the journal article; in the transformation of which we would be able to reconstruct what went into the process. The journal article is circumscribed within the conventions of a specialist science community as its components would attest to. It contains an Abstract, an Introduction, the key sections on Materials and Methods and on the Results and Discussions, and a list of References. Three tables present the results of a statistical analysis of the findings of the study.

The web article discards these explicit divisions but the main ideas of each section are preserved in the web version. A shift in emphasis is noticeable though in the web article. The web writer carries a bit in the introduction (3 paragraphs out of 8) and adds details on the food culture in the Philippines: it is “consumed either as a complement of green mangoes or as seasoning to some Filipino delicacies such as *pinakbet*”; it may be marketed “without labels.” These are not found in the journal article. Both introductions describe what bagoong is (fish or shrimp paste produced by fermenting fish or shrimps in high concentrations of salt). They assert that being marine-derived, it is a good source of DHA, a variant of the long-chain w -3 fatty acid; this was found in earlier studies to be essential to the neural development of infants. However, the web article points out additional health benefits of the DHA: “it has been found to lower blood pressure” and help prevent heart disease and mental illness. The body, except during pregnancy or the first two months of infancy, does not produce adequate amounts of DHA, so this must be derived from one’s diet, or by the consumption of w -3 precursors such as α -linoleic acid; this is found, according to the web article, in seeds and nuts. The web writer’s efforts to appeal to a broader audience is obvious: this is done by referring to cultural practices, emphasizing the health value of bagoong, and pointing out the accessibility of DHA in popular food such as seeds and nuts.

But the web article does not state the objective of the study in the introduction, unlike the journal article. To quote from the journal:

Our objective was to measure the fatty acid composition, as well as the moisture, NaCl, ash and fat contents of several varieties of fish and shrimp paste condiments obtained from local producers, with a view to assessing their potential contribution to dietary long-chain w -3 polyunsaturated fatty acids. The data obtained will be useful in nutritional evaluation of segments of the population consuming these food products (155).

This objective is placed within the context of the experiment: the possibility that “long periods of incubation” in a brine solution may result in the loss of DHA.

Instead, the web article proceeds head-on to the description of the process of collecting fish and shrimp samples in the fourth paragraph and the methods used in analyzing the samples in the fourth and fifth paragraphs. This is definitely an oversight. The browser would have understood better the significance of the methodology if it were pointed out early on that this was “*with a view to assessing their potential contribution to dietary long-chain w-3 polyunsaturated fatty acids*” and eventually for the nutritional evaluation of bagoong-eating sectors of the population. The methodology in the web article is cut to a bare minimum, so as not to overload the non-specialist reader who is unlikely to be interested in such details. An important reference point for what to include in the structure of the methodology section is the tree components to be measured as stated in the objective:” *the fatty acid composition, as well as the moisture: the NACL, ash and fat contents of several varieties of fish and shrimp paste.*” The web writer states this not as an objective within a specific context, but as some sort of organizing principle to describe briefly the methodology in the fourth paragraph.

The failure to focus on the specific objective of the study by Montano, *et al* and its context explains the rather diffused and scanty treatment in the web article on the findings of the study. Specific findings should have hued closely to each of the aspects measured in the study (as stated in the objective), and the connection of the samples to dietary long-chain w-3 polyunsaturated fatty acids (as stated likewise in the objective quoted above from the journal article). Such presentation of the findings would appeal to browsers interested what’s in bagoong that may be good for their health.

It must be pointed out that the article went through 4 drafts before it was posted in the Folio. In the initial draft, for instance, the web writer used a single reference from the *Wikipedia*. I remarked that more scholarly sources should be used and that the primary researcher, Dr. Montano, should be consulted; the result is a more respectable list of 4 references but all are on-line. I had also noted the need to research on other benefits from the DHA, thus the inclusion in the web version of health benefits other than those stated in the journal article. The Mohr method and the Soxhlet Extraction, had to be defined, I said and these resulted in definitions in the footnote. Some illogical constructions were noted such as : “This goes to show that the oxidation of fat content during fermentation [which] might have diminished due to the water activity, thus maintaining the fatty acid concentration of the *alamang*” (shrimp paste). Brackets and parentheses supplied.

The web article, moreover, appears more in touch with human participants, unlike the research article in which the experiment appears to unfold by itself, without explicit reference to their agents. Certain linguistic signals remind the browser that human beings are performing the experiment, such as “According to Dr. Montano...” ; “In the study..., scientists Nemesio Montano, Grace Gavino, and Victor C. Gavino assess the fatty acid composition of various types of fish and shrimp paste...” A bio-sketch of the scientists is appended to the article, unlike in the journal article where only the institutional affiliations are indicated. Mediation by the web writer (and unnamed collaborators) is asserted in the by-line.

On the whole, the web article was done with a lay audience in mind. This is evident in decisions of the web writer and editor on what information to include or to exclude, the organization of the article, the definitions of technical terms, the use of an informal illustration and of photos, and the use of on-line references instead of printed scholarly ones as supplementary sources, the re-titling of the article, and the reconstruction of some sentences, and its “humanization.” However, it is not enough that the editor relies only on the proposed web article; s/he must read as well the original so as to catch certain important ideas that may have been omitted in the writing of the web article.

The Folio will soon shift to a magazine format, in keeping with the type of audience it addresses; moreover, keeping in mind the multi-media expectations of web browsers and surfers, the staff plans to stream audio and video clippings where they may be appropriate in the article. The science article in Folio will then be truly a product of various collaborators, and not just of gowned scientists cooped up in their labs.

The Project Report and the Web. The web article “Breathing Manila” is derived from the project report of a commissioned study entitled “Preliminary Characterization of Air Particulates in Two Metro Manila Ambient Sites.” The primary basis for the article is the abstract of the study which consists of four sections: the Introduction, Methodology, Conclusion, and References. The web article includes all four elements but to achieve a lay style, the formal headings are omitted, new material is introduced, and ideas are re-sequenced.

The abstract of the project report introduces the study by stating that the subject of air particulates has been an active research area since the passage of the Clean Air Act in the Philippines. But the rest of the introduction is largely technical; it classifies the sources of pollution into two types: “fine aerosol fraction, known as PM2.5...which remain airborne longer and are able to penetrate deeply into the lungs” and coarse particles or PM2.5-10. The sampling of the study and the sources of the sampling are described. The web article introduces the topic by connecting the study to the health situation of the country and Asian countries: “air pollution is the primary reason for a wide range of respiratory and heart ailments.” Thus, the “Philippine Clean Air Act” was passed in 1999 and air composition has been monitored by various sectors. No technical matter is included in this first paragraph.

Methodology, the next section of the abstract, has the subheading “Air Sampling” and what follows is a 5-line sentence which identifies the material used in the collection and the manner of collecting. This is followed by the Conclusion consisting of three paragraphs, the first paragraph of which actually should have been part of the previous section of the Methodology since it explains two methods the study used to measure pollution in the particulates. The results are given in technical terms in the shorter second paragraph, but the impact of combustion and industry on the Valenzuela site is noted as greater than that in the other site. The last paragraph of the section (and that of the abstract) reiterates that the CMB as a technique is effective, without excluding, however, other techniques that may be used to analyze samples of particulates. The References used are scientific journals in print.

The web article is longer than the abstract of the project report; the difference in length stems from differences in purpose and target audience. The main concern of the abstract is to encapsulate the substance of the report for scientific readers while the web article is designed for lay browsers who would need an amplification of scientific concepts. Both include technical terms, but unlike in the abstract, these are defined in the web article, e.g. CMB means Chemical Mass Balance. It must be noted though that where additional details are needed to aid reader comprehension, the web writer draws from the full-length report (23 pages) for details, e.g. specifying the major aerosol components of the air samples in the two sites and citing an evaluation of these air samples by the NAQS Report in 2004. Moreover, a photo of Manila in a haze is put at the center of the article. Thus, the web browser can understand the findings explained in the next paragraph, unlike in the abstract of the report. It is significant, however, that neither the abstract nor the web article include the tables and graphs in the original report that show the results of statistical correlations. Repeated references are likewise made to Dr. Quirit, the principal researcher, as if to invoke the authority of an expert, but actually factoring in as well the human participant.

The conclusion of the web article stresses the importance of the Quirit experiment to the community: “Studies like Dr. Quirit’s work could help find solutions to air pollution and make us breathe clean air once again in Manila and the Philippines.” We are brought back full circle to society-at-large for whom the study—both the experiment, and the discourse on the experiment are addressed.

The Four Lives of the Web Article: Re-tracing the Process. The preceding sections compare two web articles to their precedents—the scientific journal article and the scientific abstract. The comparison results in a description of the scientific web article, a relatively new genre of scientific discourse. But styling science for the web entails a distinct transmutation process. “Bagoong for the Brain” and “Breathing Manila” were posted in the web only after five re-visions, in which changes were made both in form and substance. These were done largely through close coordination between the editor (this speaker) and the writer above. Below are excerpts from the first draft of the Quirit article and the suggested changes; the second draft follows.

Draft 1

Understanding the Manila Breath Breathing Manila?

Air pollution has been one of the major health risks in the Philippines. Alarming number of deaths and illnesses were attributed to the uncertainly **word use** safe air that the Filipino public breathes. **Documentation?** These health hazards pushed the government into passing the Republic Act No. 6749 known as the “Philippine Clean Air act of 1999” to minimize air pollution attaining **thus attaining?** a more desirable living environment. Since then, air composition has been under constant monitoring **by whom?**

and the study of particulate matter has become an active research **Insert area** in the Philippines.

A research **One of these studies is a research project** by Dr. Leni L. Quirit of the Institute of Chemistry, University of the Philippines Diliman in 2004 is one of the studies which investigates on **Delete on** air particulate matter (PM) chemical compositions identifying air pollution sources for a particular location. **Sense?**

Draft 2

On **Delete “on”** Breathing Manila

Air pollution has been one of the major health risks in the Philippines. An alarming number of deaths and illnesses assessed by health-concerned institutions **(the underlined is still vague)** have been attributed to the safe air that the Filipino breathes. **These health hazards pushed the government into passing the Republic Act No. 8749,** (Restate)known as the “Philippine Clean Air Act of 1999” to minimize air pollution and thus attain a more desirable living environment. Since then, air composition has been **under the constant monitoring** (Replace with verb phrase) of the designated branches of the government and the study of air particulate matter has become an active research area in the Philippines. **One of these studies is the research project of Dr. Leni L. Quirit of the Institute of Chemistry University of the Philippines, Diliman. Her work entitled “Air Pollutant Characterization and Source Identification of a Selected Metro Manila Sampling Site” (2004) is one of the studies which investigates air particulate matter (PM) chemical compositions identifying air pollution sources for a particular location.**(Restate for conciseness.)

Draft 3

Breathing Manila

Air pollution has been one of the major health risks in the Philippines. Air pollutants are confirmed to be a major cause of premature death and illnesses, and are the primary reason for the wide range of respiratory and heart ailments, according to the Clean Air Initiative for Asian Countries (1). Thus, the government was prodded to pass Republic Act No. 8749 known as the “Philippine Clean Air Act of 1999” to minimize air pollution and attain a more desirable living environment. Since then, designated branches of the government have constantly monitored air composition and the study of air particulate matter has become an active research area in the Philippines. One of these studies is “Air Pollutant Characterization and Source identification of a Selected Metro Manila Sampling Site” (2004) by Dr. Leni L. Quirit of the Institute of Chemistry University of the Philippines Diliman.

In the excerpts shown above, editing changes are suggested: change in vocabulary (uncertainly), in usage (an active research; A research by), in idiom (investigates on), in connecting ideas (attaining to thus attaining). But matters of substance are attended to: as well, such as providing documentation; clarifying vague generalities (constant monitoring?); rewriting an illogical statement and wordy portions.

Conclusions

Style means “the consistent occurrence in the text of certain items and structures, or types of items and structures, among those offered by the language as a whole” (Malmkjer 438). As such, style is akin to genre when it is taken to mean: a text or discourse type recognized as such by its users by its characteristic features of style or form (Malmkjer 176). The style of a scientific journal article and that of a scientific report must conform to expected features of style; writers do so to legitimize knowledge claims among a community of scholars who examine, follow, and evaluate arguments as signaled by these discourse features.

The title of this study, however, uses “styling” to mark linguistic and structural moves to bridge the divide between the scientific researcher and the public-at-large. In the analyses of the two articles above, certain similarities can be observed but there are differences as well; obviously, the web writer and collaborators are concerned less with following patterns or conventions, but with deploying effective strategies to bridge the divide between science and the “cyberpublic.” Since the cyber medium is not confined to the print text, but is open to multimedia possibilities, the web article is expected to evolve along these lines. Styling science for the web is a deliberate break from the “esoteric forms” of the scientific journal article and the scientific report to utilize their “cognitive potentials” in enhancing everyday life.

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