

Functional demands of statistical literacy: Ability to read press releases from statistical agencies

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1. Introduction

Teachers are often asked by their students to explain how statistical knowledge gained in the classroom, whether at the high-school or college levels, will become useful later on in life. A common response that teachers provide is that learning statistics imparts to students the knowledge needed to be "smart consumers" or "informed citizens" who can identify and not be fooled by "misleading" graphs, "flawed" statistical reports, or "problematic" probabilistic claims. This knowledge is considered one of several components of statistical literacy, a construct describing the ability to comprehend, interpret, and critically evaluate messages with statistical elements or arguments (Gal, 2002). Statistical literacy has been positioned as an important skill for citizens and a desired outcome of statistics education (Wallman, 1993). However, while the knowledge bases and beliefs and attitudes that underlie statistically literate behavior have been outlined in some detail, it is less clear *how* to develop them (Batanero, 2002). This paper focuses on the role that press releases from statistics agencies can play as part of statistical literacy education.

2. About press releases from statistics agencies

Statistics agencies are publicly-funded organizations appointed by governments to collect, analyze and publish statistics on designated topics. Such agencies produce an array of products, mainly indicator data, press releases, executive summaries, full reports and yearbooks, and aggregate data tables. These and other products are created primarily to inform officials and decision makers, but are also available to educators, students, and citizens at large (Murray & Gal, 2002).

Press releases are the key mechanism by which agencies convey their output to the media, and inform journalists about new findings from recent studies or analyses conducted by the agency (Podehl, 2002). Journalists use them as the basis for writing messages in a style suitable to the characteristics and interests of their particular audiences. Yet, the characteristics of press releases have not been explored, although they are a critical link in the chain of information from producers of statistical messages to their target audiences (Rumsey, 2002)

A recent qualitative analysis of press releases from four national and two international agencies (Gal, 2003) found that these products require that readers understand a wide range of statistical ideas, concepts, and procedures, many of which are included in a standard statistics curriculum. Press releases sometimes also discuss research methods or limitations of studies and inferences from them. Overall, press releases had a relatively uniform style and format within most agencies analyzed, but more variability in format and style across agencies. Releases from some agencies tended to be relatively short (1-2 pages), and comprised of separate, relatively short paragraphs written in a semi-formal journalistic style. Releases from other agencies tended to be longer and presented more absolute numbers and percentages or graphs and tables.

Gal (2003) pointed out that press releases vary in the extent to which they list raw statistical findings and "let the numbers speak for themselves", or on the other hand surround the findings with interpretations and commentary about their meaning, implications, or limitations. It could be

argued that the presentation of findings without much explanatory text benefits users because they gain access to "objective" or "untainted" reporting. Yet, the lack of explanations about the overall meaning, importance, or limitations of findings puts more burden on the users, who need to interpret on their own factual statements, read texts and numbers carefully to notice patterns, and know what critical questions to ask about the text (Gal, 2002). Some press releases use non-standard statistical terminology or expressions, and hence their interpretation requires the activation of a range of literacy skills, not only statistical skills. Thus, the amount of commentary that agencies offer in press releases has implications for the type and level of background knowledge and skills that users need to possess.

Following is an excerpt from an OECD press release of March 2003 [online: www.oecd.org], illustrating how statistical information is embedded in a text that combines a journalistic reporting style with interpretative comments.

Many of the people receiving disability benefits are capable of working and want to work, but are discouraged from finding jobs because of faulty government policies, concludes a new OECD report. ...In most countries, people who enter disability-related programmes remain beneficiaries until retirement. On average, only 1% of benefit recipients find a job each year.

...Some of the individual country results were startling:... In the Netherlands, the proportion of young women between the ages of 20 and 35 who receive disability benefits is three times higher than for their male counterparts. ...In Austria, persons over 55 years are more frequently on disability benefits than in any other country, while rates for Austrians under age 50 are much lower than elsewhere.

...Country-by-country comparisons of disability systems can be difficult, since some are managed by central agencies, while others are managed by many levels of government ...

3. Educational benefits of using press releases

The use of press releases offers several benefits to educators who want to promote students' statistical literacy.

Prepare students to evaluate examples for proper statistical reporting. Educators attempting to directly develop students' statistical literacy skills tend to use media clippings containing examples for problematic statistical claims or reports, such as those that confuse correlation with causation or significance of differences with meaningfulness of differences, or that use misleading graphs or lack essential details about samples (Best, 2001, Moreno, 2002). While the use of such examples is obviously of value, students also need to encounter a sensible dose of models for effective or fair statistical reporting, if they are expected to act as informed consumers of research. Students' ability to critically reflect on key issues such as the trustworthiness of the inferences, or the limitations imposed by the data-gathering process on possible conclusions (Utts, 1996), can be enhanced if they can compare and reflect on the differences between examples for both what to do and what not to do.

Increase opportunities for statistical communication. Calls for reform in statistics education emphasize the need to develop students' communication skills, but this often revolves around students' reporting about outcomes from their own projects or from in-class analyses. When students engage external materials (other than media articles whose limitations were mentioned earlier), they may be asked to read academic research papers which are likely to be difficult for many students due to terse language and unfamiliar contexts. In contrast, press releases enable teachers to engage students with statistical texts that are less formal and shorter yet still address a range of statistical concepts and ideas. Further, press releases can show how proper statistical terminology may be embedded in relatively colloquial yet balanced presentation (unlike the sensationalistic writing style that is more common in the media), and present statistical findings and their limitations and implications in a socially meaningful context. These features may help to stimulate students' interest and develop effective statistical communication skills regarding

quantitative matters (Steen, 2001), and help to develop the literacy skills that are a key and essential component of statistical literacy (Gal, 2002).

4. Discussion and conclusions

This paper argues that the development of students' statistical literacy, which has been recognized as an important educational and societal goal (Steen, 2001), should expose students to a balanced dose of exemplars for both problematic and effective real-world statistical reports and graphical and tabular displays. Press releases are of importance for statistical literacy education as they can illustrate to students how statistics get reported to the media, and may be a valuable tool for educators aiming to promote their students' statistical literacy, if their usage can be embedded in ongoing instructional sequences.

However, thousands of press releases and executive summaries exist in diverse locations. There is a need to identify those particularly suited for use in classes that aim to promote statistics literacy, and develop guidelines for linking these materials to specific course elements or topics. The needed selection of materials and preparation of guidelines and suggestions cannot be conducted only by individual busy teachers. Organizational stakeholders have to be involved.

A potent example for an ongoing effort of harvesting media articles and developing instructional activities around them can be found in the CHANCE project (Snell, 2002). The development of a resource regarding press releases from statistics agencies can follow the same approach and be based in academia. However, statistics agencies can be involved as they are in a position to provide educators with sets of press releases matched with the actual media articles that used these releases, given that agencies retain detailed files with media quotes and excerpts from publications based on their releases. It should be possible for agencies to pool their efforts and resources and compile a searchable collection of press releases, organized by categories tuned to various needs of teachers, such as in terms of statistical concepts or methods, topic or subject (e.g., agriculture, education, economy), and grade or educational level.

Such a collection, if accompanied by field-tested implementation guidelines, can benefit statistics agencies because it would allow them to make their clients, i.e., learners, better able to use products and services created by each agency. At the same time, such a collection can contribute to statistical literacy education and through it to the development of a more informed citizenship.

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RÉSUMÉ

Cette allocution portera sur la nécessité de développer les capacités de lecture de documents statistiques des adultes et sur le besoin d'enseigner aux étudiants à comprendre des communiqués de presse provenant d'organismes statistiques officiels. De tels communiqués sont l'une des sources principales d'information dont se servent les médias pour transmettre leurs messages au public. Dans cette allocution, on examinera brièvement la nature des communiqués de presse et on parlera de leurs répercussions sur le travail des enseignants et des organismes statistiques.