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# Morality and News Media Representations of Mathematics Education

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*Mathematics education is often in the news and is often presented in controversial terms. The nature of news reporting influences public opinion, public policy and the context of mathematics teaching. In this study, we looked at how mathematics education is framed in Canadian newspaper reports after the publication of recent PISA results. We analysed 26 articles published in two clusters, in two national newspapers. We particularly focused on the moral dimension implicit in this corpus of news reporting. Our analysis revealed a dominant framing derived from the binary of traditional teaching vs. discovery learning, which is portrayed to be the prevailing cause of students' decline in PISA ranking. The dominant framing also includes a sense of moral decline related to both educational and economic trends.*

## Introduction

Mathematics education is often in the news. A cursory search reveals coverage of, among other things, the results of international comparisons, national tests, curriculum changes or periodic reports produced by various bodies, generally showing a decline in standards, skills or quality of students or teachers. For many mathematics educators, such reporting is of professional interest, perhaps a source of frustration at times, but ultimately not that important. In this paper, we start with the assumption that news reporting of mathematics education actually matters quite a lot; such reporting, along with associated commentary and debate, shapes the way in which mathematics education is understood by the general public. The general public includes, of course, parents, taxpayers, employers, politicians, student teachers and current teachers. All of these people have an interest in mathematics education.

In what follows, we report our analysis of part of a corpus of Canadian news media reports relating to mathematics education.

Our goal is to understand how mathematics education is portrayed in news media. We report specifically on a group of articles that appeared in December 2013 and January 2014 triggered by the release of the international PISA mathematics findings (OECD, 2013, 2014). Our analysis is based on a critical discourse perspective and draws specifically on the media theory concept of framing. For this paper, we focus, in particular, on the moral dimension implicit in the news reporting we have analysed.

## Literature Review

When education is the focus of the popular press, the media has a strong influence on public opinion; it influences “the dynamics of opinion expression and formation” (Scheufele & Tewksbury, 2007, p. 10). More specifically, the way in which particular news is framed in the media significantly influences the assessment and judgment of the audience: “framing guides the audience on how to think about an issue” (Kee et al., 2012, p. 17). As a result, the relationship between the education system and the public is, in part, mediated by images portrayed in the media, which may (or may not) be indicative of day-to-day classroom activities.

Research on the framing of education in news media suggests that educational stories are mostly presented in a negative light. Camara and Shaw (2012), for example, criticise educational media coverage, arguing:

Press coverage of educational issues tends to be biased and provides greater attention to the negative rather than positive side of stories, presents an incomplete or too simplistic view of educational issues, exhibits a major lack of understanding of statistics and educational research. (p. 34)

This kind of negativity has been noted specifically in relation to mathematics education. In particular, publication of PISA results generates extensive and controversial headlines in different participating countries. Pons (2012) referred to this media coverage as “PISA shock”; that is, the popular media discourse that focuses primarily on how each country is positioned in the PISA rankings, producing and

disseminating “shocking” headlines, as well as the way in which this coverage leads to particular ways in which people analyse, translate, and reinvest the results of PISA. For example, the publication of the first round of the PISA results in December 2001 had a “Tsunami-like impact” (Gruber, 2006, p. 195) in Germany, affecting educational policy-making discourse (Waldow, 2009) and fundamentally changing the educational discourse in Germany (Ertl, 2006).

We have noted similarly strong headlines in our corpus, including “Canada’s fall in math-education ranking sets off alarm bells” or “Math wars: The division over how to improve test scores”. Mathematics educators may find such headlines irritating or frustrating, since they can appear to give an unbalanced and misleading view of mathematics teaching, learning or curriculum. In our research, however, we have become interested in the implicit moral aspect that such headlines hint at. What we look at in this writing, then, is the not the PISA results themselves, but the “PISA-shock” – that is the reaction to PISA – in two Canadian national newspapers.

## **Theoretical Framework: Discourse and Frames**

Our research is broadly framed by a critical discourse perspective (e.g. Edwards & Potter, 1992). From this perspective, language is not seen as a neutral medium for describing a pre-existing reality. Descriptions always involve choices about what to highlight, what to leave out, and what specific words to use. The language of news reporting constructs particular versions of the world. These versions of the world are seen as reflecting particular interests and as designed for particular audiences (Edwards & Potter, 1992). News texts are not created in a void, however. They draw on prevailing discourses and ideas about any given topic.

Critical discourse frameworks have been used in mathematics education since Walkerdine’s (1987) study of the discursive construction of rationality and associated discourses of the autonomous child found in much constructivist writing about mathematics learning. Her analysis of this prevailing idea of rationality relates to a view of society based on individual choice and normativity. Abstract reasoning is seen as the ‘normal’ endpoint of individual intellectual development, and as the means with which individuals can then function in a capitalist society.

Walkerdine's (1987) analysis has been extended in subsequent work, including Appelbaum's (1995) examination of constructions of mathematics education in popular culture, including news media, in the USA in the 1980s. He argued, among other things, that mathematics teaching was popularly constructed as a kind of heroic, individual endeavour. This construction makes it more difficult to think about mathematics education in social or political terms. The discourses about mathematics teaching identified in Appelbaum's (1995) research draw on discourses circulating in society, but also contribute to the reproduction of these discourses. More recently, Lange and Meaney (2014) noticed that a sample of media texts collected in Australia reflected a discourse of commodification of children in which children were seen as objects of investment (of time, of money, etc.) and to which "value needed to be added" (p. 392), again reflecting the link between mathematics education, rationality and a capitalist society.

## Framing

The term 'framing' refers to "modes of presentation that journalists and other communicators use to present information in a way that resonates with existing underlying schemas among their audience" (Scheufele & Tewksbury, 2007, p. 12). At the same time, framing is based on the assumption that the way an issue is characterised in news reports can have an influence on how it is understood by audiences. Moreover, through framing, news is characterised in terms of pairs of concepts that readers come to see as connected (Price & Tewksbury, 1997). News often frames this connection by establishing predominant labels (e.g. the description of politics in terms of left and right) to show how forces and groups in society are shaping public discourse (Scheufele & Tewksbury, 2007). For example, in the framing of PISA in news reports, the forces and groups that are shaping the public discourse are actors such as parents, governments and ministries, teachers, and curricula and the established predominant labelling are 'back to basics' and 'discovery learning'.

Entman (1993) proposes four elements of a given news framing. The frame includes a *problem definition*: it defines particular aspects of an event as problematic situations. It establishes a *causal relationship*: the frame identifies forces creating the problem. There is a *moral*

*judgment*: that is, an effort to “personalise the news, dramatise or emotionalise it, in order to capture and retain audience interest” (Semetko & Valkenburg, 2000, p. 96). The moral judgment is not simply a judgment of what is equitable, it is a judgment that is “laden with emotions” (Gamson, 1992, p. 7). Finally, the frame includes *endorsing remedies*: it offers and justifies treatments for the problem and predicts their likely effects.

Entman (1993) explains that framing involves selection and salience. It is through framing that particular aspects of an issue are highlighted and others are ignored (Matthes, 2007). Hence framing guides the audience by the omission of potential problem definitions, explanations, moral evaluations, and recommendations as much as they do by their inclusion. In summary, the dominant framing consists of the problem, plus the causal, moral evaluative and treatment interpretations that are most likely to be noticed, processed, and accepted by the most people. So the dominant framing is a framing of a situation that is most heavily supported by the text and is, ideally, congruent with the most common audience interpretation of the situation.

Based on this theoretical perspective, we established the following research questions: How are the PISA results framed in the corpus of news articles? How is mathematics education constructed through these frames? What moral judgments are implied by these frames?

## Methods

We examined three national print publications: the *Globe and Mail*, the *National Post* and *Macleans* (a weekly publication), to represent a range of national news coverage. We collected all news articles on mathematics education in these publications within a six-month period (September 2013–March 2014). Altogether we found 64 articles: 45 in the *Globe and Mail*, 16 in the *National Post* and 3 in *Macleans*. In this paper, we report our analysis of a subset of 26 articles, all published within a few days of each other, that covered the then recently released PISA results. This subset consists of two clusters of articles: a) 15 articles in a 4-day timeframe: 2–6 December 2013, and b) 11 articles in a 5-day timeframe: 7–12 January 2014. The first cluster appears to have been triggered by the publication of the PISA 2013 results. The second cluster appears to have been triggered

by the announcement of a \$4 million fund for teacher professional development for mathematics teaching by the Ontario Ministry of Education in response, in part, to the PISA findings. We focus on these two clusters to investigate framing with respect to the PISA results.

To analyse the subset of articles, we first examined each article in terms of the four aspects of framing. We read all the pieces thoroughly, and re-read them several times. In each reading we looked for a coherent sets of phrases and statements that seemed to represent or talk about any of the four aspects of framing (i.e., general problematic situation, causes, moral judgements, and treatments). To ascertain how certain aspects of the PISA results are highlighted and others are ignored, we looked for words, phrases and metaphors used to describe a particular image: for example, phrases such as ‘math wars’, ‘battleground’, ‘national emergency’, ‘watering down discovery learning’, ‘avalanche of concern’ and ‘downward progression’. We then looked for commonalities in how these different aspects of framing appeared across the corpus, as well as instances that ran counter to any general patterns. In all the readings we kept asking ourselves what images or ways of thinking about PISA results are presented and/or denied by the framing, and if we could identify a dominant framing. While there is some variation across the selected articles, we were able to identify a broad overall frame to which most of the articles were oriented (occasionally by adopting an explicitly alternative stance). In the next two sections we first summarise the nature of the dominant frame we identified in the set of articles and then examine the moral dimension of the frame in more depth.

## **The Dominant Frame: Traditional Teaching vs. Discovery Learning**

The dominant frame that emerged from our analysis used the PISA mathematics results to portray the decline in Canada’s ranking as a problematic situation. The following statements were used in many articles to manifest this prevailing situation:

An increasing percentage of Canadian students are failing the

math test in nearly all provinces. (Globe and Mail, 7 January 2014)<sup>1</sup>

PISA results were not a disaster for Canada. But they were a giant, flashing amber light. Canada's student performance, formerly well above the OECD average, is now considerably less so [...] our students are doing decidedly worse in math than they did a decade ago. (Globe and Mail, 9 January 2014)<sup>2</sup>

With respect to this problematic situation, different articles identified different causes, including the way mathematics is taught, the mathematical competence of school-teachers, and lack of societal expectations. Not surprisingly, perhaps, we found that the dominant framing particularly suggested a strong connection between the decline in Canada's PISA ranking and the ways in which mathematics is taught. This causal relationship is established through a contrast between traditional, back-to-basics teaching and discovery learning. These ideas were represented by two groups of terms, including: "conventional math", "fundamentals that parents were taught" and "basic math algorithms" versus "learning by investigation, problem solving, and open ended questions", "conceptually based" learning, and "discovery learning". For example:

For one, straight long division isn't on the curriculum anymore; at least not as it once was. The old ways of learning — rote strategies and "math facts" — have been replaced by so-called "discovery math" and "inquiry-based" teaching methods that focus on word problems, strategies and estimations. (National Post, December 5, 2013)<sup>3</sup>

Gone are the days, in much of the country, of long division, mad-minute multiplication, addition with a carry and subtraction with a borrow. Today, children in provinces that have introduced the Western and Northern Canadian Protocol (WNCP) curriculum — a vast swath of the country — learn instead by investigating ideas through problem-solving, pattern discovery and open-ended exploration. (Globe and Mail, 10 January 2013)<sup>4</sup>

Quoting Professor Donna Kotsopoulos, the article referred to in this last quotation stated: “If you look at what’s been happening, predominantly over the last decade, there’s been an unprecedented emphasis on discovery learning”. Citing Robert Craigen, a University of Manitoba mathematics professor “who advocates basic math skills and algorithms”, the article noted:

Canada’s downward progression in the international rankings, slipping from 6th to 13th— coincides with the adoption of discovery learning. (Globe and Mail, 10 January 2013)<sup>4</sup>

The dominant framing suggests various treatments to the problematic situation. These treatments were closely allied to the identified causes and included: extending teacher education program and including more emphasis on mathematics; changing the curriculum; and following Quebec’s education system. This last point is related to Quebec’s relatively superior performance in PISA in Canada. In many articles, Quebec is referred to as the province that “adds” while the rest of “Canada subtracts on its math scores” (Globe and Mail, 3 December 2013)<sup>5</sup>. The reporting of Quebec’s performance fits within and contributes to the same binary frame of ‘traditional’ vs. ‘discovery learning’. For example:

Quebec, with its intensive training and teachers who apparently refuse to shirk algorithms despite reforms, enjoys the best scores in Canada and is now at the centre of math-education research. (Globe and Mail, 10 January, 2014)<sup>4</sup>

Moreover, the dominant framing suggests a strong connection between the need to change curricula and a Manitoban parent-led campaign and petitions reported in other provinces. That is, grassroots movement of parents and educators are portrayed as “pressing provincial governments across the country to make immediate changes to the way math is being taught” (Globe and Mail, 8 January 2014)<sup>6</sup>.

Overall, the dominant framing we have described based on the full set of articles draws on the binary of ‘traditional’ teaching vs. ‘discovery learning’. It relates a clear problematic situation (Canada’s lower PISA

ranking) to a cause (not enough traditional teaching) and an associated treatment (more traditional teaching) through, among other things, curriculum changes to include more emphasis on arithmetic facts and procedures. These features of the framing form the backdrop to the aspect we found most interesting: the moral dimension.

## Moral Judgments

We noticed two aspects in the moral dimension of the dominant frame: the choice of words to describe mathematics education and the use of anecdotes, often featuring parents, to illustrate the news reports.

The moral aspect of word choice can be seen in many of the quotations in the previous section. For example, the choice of the word ‘failing’ in the first quotation (“increasing percentage of Canadian students are failing the math test”) carries an implicit moral judgment: failing is bad (the claim that students are failing is, of course, questionable). When combined with the causes included in the dominant frame, the implication is not just that failing is bad, but that discovery methods are also bad. Across the set of articles, a diverse set of word choices combine to paint a picture of moral decline. Canada’s performance is a “giant flashing amber light”, a “downward progression” and “slipping”, with students who are “doing decidedly worse” (it is the word ‘decidedly’ that hints at moral failure). This moral judgement is explicitly linked to the binary division of traditional teaching from discovery methods. For example, the contrast “Gone are the days” (of traditional methods) with “today [...] vast swathes of the country” (are using discovery methods)<sup>4</sup> suggests the replacement of something reasonable with a rather more dubious approach: “vast swathes” implies a marauding invader, rather than the spreading of something positive. This link between morals and causes, and indeed treatments, also appears in the depiction of Quebec, where teachers “refuse to shirk” traditional methods, “despite reforms” and so “enjoy” success<sup>4</sup>. Finally, several articles captured this sense of moral decline and linked it to broader economic concerns:

This is something that should send shivers of fear down all of our spines. If Canadian students cannot master basic math skills early on, there is no question that we will fall behind in

economic competitiveness. And it will happen quickly. (Globe and Mail, 6 December 2013)<sup>7</sup>

The genie is now out of the bottle,” said Paul Cappon, a former head of the Canadian Council on Learning who is now with the University of Ottawa. “Not only is Canada mediocre at best, we now know that our future in learning, and therefore our prosperity, is more clouded than ever.” (Globe and Mail, 4 December 2013)<sup>8</sup>

This is on the scale of a national emergency,” said John Manley, CEO and president of the Canadian Council of Chief Executives, which has sounded the alarm on the shortfalls in our education system. (Globe and Mail, 3 December 2013)<sup>9</sup>

Hence, failing and falling scores are related to “shivers of fear”, “falling behind” economically, mediocrity, loss of future prosperity and a “national emergency”, with the clear, even incontestable point that negative economic performance is morally bad. It should not be forgotten that PISA is a project of the OECD, an organisation that works for economic development, not education.

Moral judgment was also conveyed through anecdotes featuring parents. Here are two examples:

Ms. Murray said she felt compelled to speak up after tutoring students in math who haven’t mastered basic skills. “I see the same problems everywhere I go. Serious gaps with addition, subtraction, multiplication, division. More complex arithmetic is almost completely missing,” she said. “Any parent I have ever spoken to understands the problem, but feels helpless – that no one will listen to them.” (Globe and Mail, 7 January, 2014)<sup>1</sup>

Tara Houle, a mother of two in North Saanich, says she has seen firsthand the confusion so-called discovery-based teaching techniques can lead to. “[My daughter] was being taught using Sudoku math puzzles [in Grade 3]. They had computer games in the classroom to learn the times tables,” she said. “They were these methodologies to, I guess, conceptualize and make children think in different ways to come up with the answers. We don’t have an issue with [that]. However, there wasn’t a

lot of emphasis on, say, learning the multiplication table.” Her daughter continued to struggle with these concepts until she was enrolled in an after-school math program. “The transformation was incredible,” Ms. Houle said. “After understanding their simple and effective methodology to solve math problems, it made her embrace math again. We went back to the basics.” (Globe and Mail, 9 January, 2014)<sup>3</sup>

In these two accounts, the moral judgments relate to parents’ feelings of “helplessness”, observing their children’s “confusion” and “struggle” followed in one case by an “incredible” transformation when traditional methods were provided. These accounts are constructed in terms of lack (for example, of “basic skills” and of “learning the multiplication table”) arising from “so-called” discovery methods. In these accounts, moral decline is linked to the challenges faced by parents (which most readers would be) who are constructed as wanting to address this decline through their own actions. This portrayal suggests a kind of ‘meta-moral’ problem in which the badness of decline is compounded by a loss of agency on the part of parents to tackle the decline themselves.

## Discussion and Conclusions

Our study of the two clusters of Canadian newspaper reports of the result of PISA revealed a dominant organising framing in which the different elements – problematic situation, cause, moral judgments, and treatment – are clustered and held together through a narrative of decline. This frame is derived from the binary of traditional teaching vs. discovery learning. The different dimensions support each other to sustain an overall portrayal of mathematics education riven by the dispute between proponents of these two approaches to teaching. It is important to underline that we do not necessarily accept the distinctions and categories used in the news articles. Indeed, it is important to contest the idea that all mathematics teaching falls neatly into one of these two categories, rather than being, for example, a mixture of these and other ideas. Mounting such a challenge is, however, likely to be difficult. The binary underpinning the dominant frame is largely taken for granted, coming close to being a ‘regime of truth’ (Foucault,

1979) in that even alternative positions must conform to these general categories.

Similarly, the news reports carry a fairly strong moral tone related to the general sense of decline. Again, this moral tone is related to deeply embedded and largely unquestioned assumptions. After all, who is in favour of educational or economic decline? It is important, in fact, to note this connection with economic prosperity as both a key purpose of education (in this portrayal) and a key source of moral judgement, since increasing prosperity is assumed to be a good thing in capitalist societies.

How, then, as mathematics educators, can we respond, if at all? It is difficult to know how to respond to frames that are based on assumptions that come close to the status of regimes of truth. Any response or attempt at rebuttal will tend to be framed in the same terms. Indeed, one or two articles illustrate this, challenging the binary distinction, and so reinforcing it. The reflexive relationship between news framings and public understanding of issues means that it is difficult to change these framings. It is part of the nature of frames to use binaries and to simplify complex situations to make them more digestible. Attempting to explain the complexity of mathematics learning and teaching is difficult to do within the constraints of a news frame. Appelbaum (2014) has engaged with this challenge, arguing for something like guerrilla-style “tactics” (another part of the battle metaphor) in which we try to disrupt the frames and so make people think. For our part, we do not have any simple suggestions; instead we welcome discussion on this issue.

## Notes

1. Math wrath: Parents and teachers demanding a return to basic skills. By Alphonso, C. & Maki, A. *Globe and Mail*, 7 January 2014.
2. Canadian education: The math just doesn't add up. Editorial. *The Globe and Mail*, 9 January 2014.
3. Math isn't hard. Teaching it is. By Urback, R. *National Post*, 5 December 2013.

4. Math wars: The division over how to improve test scores. By Carlson, K. B. *The Globe and Mail*, 10 January 2014.
5. Quebec adds, Canada subtracts on its math scores. Editorial. *The Globe and Mail*, 3 December 2013.
6. Ontario unveils \$4-million math upgrade plan. By Morrow, A., Alphonso, C. & Maki, A. *The Globe and Mail*, 8 January 2014.
7. The double danger of low math scores. By Hirsch, T. *The Globe and Mail*, 6 December 2013.
8. No time for educational complacency, Canada. By J. Simpson. *National Post*, 4 December 2014.

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