



Mathematics Education in the News: Introduction

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During the recent Ontario general election, the victorious Progressive Conservative party made mathematics education a feature of its platform. The *Toronto Sun* ran a front-page headline during the campaign that captured Progressive Conservative Party leader Doug Ford's position: 'BACK TO BASICS'. While the Conservative Party proposals were not especially detailed, nor the campaign message particularly nuanced, the newspaper headline is certainly succinct and simplistic. What is interesting about it, however, is that it indexes a well-established discourse in news reporting and public debate about mathematics teaching and curriculum. The headline writer did not feel it necessary to elaborate or even mention mathematics directly. The expression 'back to basics' seems to address mathematics education directly and there is a clear assumption that readers will understand what 'basics' refers to.

As mathematics educators, we are likely to find talk of 'basics' anathema, not because we are somehow against children learning 'basic' mathematics (whatever that might be), but rather because we also key into the discourse indexed by the headline. Many of us are concerned that 'back to basics' means a return to rote memorisation, drill and kill, fear and loathing of mathematics among school children, and a poor grasp of concepts, connections and the rich complexity of the subject.

This example serves to illustrate some broader questions about the treatment of mathematics education in news media and the role of mathematics education in interpreting media reporting. What discourses are apparent in news coverage about mathematics education? How does the medium shape the message? How do consumers of news media interpret these discourses? How do these discourses construct mathematics education, mathematics curriculum, teachers, students and so on? How are prevailing discourses linked to broader political ideologies?

These questions matter, because news reporting matters. News reporting shapes public opinion and popular thinking, including about mathematics education. News reporting also reflects public opinion and popular thinking. There is a reflexive relationship between the two. In a time of fake news, social media, click bait and rapid news cycles, in which news reporting must compete with other sources of information, opinion and outrage, it is important to pay attention to the discourses that are made available to the public about mathematics education. Both news media discourse and public opinion involve interactions of

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multiple voices in complex ways. The news media are an amalgam of many discourses, creating ‘a site on which various social groups, institutions, and ideologies struggle over the definition and construction of a social reality’ (Gurevitch and Levy 1985, p. 19).

These questions also matter because, as mathematics educators, we are implicated. When mathematics teaching and mathematics curriculum become news, we must decide how to respond. While some eschew joining the public debate, others join the fray, authoring op-ed articles or speaking with journalists. There is no easy approach. Speaking up can expose us to misquotation, social media trolling and criticism by other public figures. Some will argue that as leaders in mathematics education, we have a responsibility to contribute to public debates. Others will feel that the simplistic nature of such debates demeans our work. Whatever one’s position, it seems to us that a good understanding of the nature of news media reporting of mathematics education is essential, in order to make informed decisions and to contribute effectively. It is therefore surprising that little research has been conducted on the nature of news media discourses of mathematics education.

We will not offer a detailed literature review here: each contribution to this issue includes reviews of previous research relevant to their study. Looking across these reviews, we can see that a few trends emerge. First, analysis of the portrayal of mathematics education has looked at a variety of media, including news coverage, films, radio broadcasts and government publications. Such portrayals tend to reinforce long-standing stereotypes about mathematics and mathematicians, including the ideas that mathematics is difficult, that mathematical learning proceeds through flashes of insight, and that mathematicians are generally men with poor social skills (Berch and Mazzocco 2007; Leyva 2017; Markovits and Forgasz 2017; Moreau et al. 2010). Second, news reporting of mathematics education is particularly concentrated on international comparison results, such as outcomes from the OECD’s PISA studies. Previous research has noted the interaction between such reporting and changes in government policy. While it is impossible to untangle these interactions, it seems clear that the publication of PISA findings has on some occasions led to dramatic policy changes, and that these changes are at least in part driven by public reporting. One study referred to this effect as PISA shock (Pons 2012; see also Yasukawa et al. 2017). Third, news reporting is political, not in the sense that it necessarily promotes a particular political agenda (although it might), but rather that it reflects and influences current political debates and framings. As such, media coverage tends to oversimplify the complexity of teaching and learning mathematics, seemingly reducing these endeavours to naïve, dichotomous discourses such as ‘back to basics’ vs. ‘discovery learning’. It also tends to dramatise the narrative, often in terms of ‘us’ and ‘them’, success and failure, crises and solutions (Appelbaum 1995; Yasukawa et al. 2017). In this special issue, we contribute to this literature by collecting five papers that examine different aspects of the relationship between news media and mathematics education.

In the first paper, Janelle McFeetors and Lynn M. McGarvey explore the ‘Canadian Math Wars’ of discovery learning and back to basics, not based on news reports but instead based on the public’s perception of the news. They used variation theory to investigate the many variations in public perceptions about school mathematics and, more specifically, to highlight public perceptions about ‘basics’ in school mathematics in the wake of the release of the 2012 PISA results. They collected 5000 online comments posted by readers to articles referring to mathematics in Canada’s two main national newspapers, *The Globe and Mail* and the *National Post*, from June 2013 to June 2014. Using a phenomenographic methodology, they identify five dimensions in the content of the online comments, namely the learning process, the results of learning, the order of learning, learning tasks and the nature of mathematics, while placing the focus on ‘Mastering Basic Computational Skills’. They also highlight the widely differing public perceptions of the goals that should be pursued by an ideal approach to school mathematics. Confirming the fact that people are not passive recipients of the news, they reveal that the media’s attempt to create a dichotomy between ‘back to basics’ and ‘discovery learning’ does not adequately reflect the many ideals held by the public. The evidence indicates that people negotiate with media messages in complex ways. McFeetors and McGarvey show that many members of the public are willing to look beyond the media’s contrived binary choice: contributors to the comment threads demonstrated this disposition as they articulated multiple perspectives and intentions regarding the kinds of mathematics that should be taught and learnt at school. Among these

perspectives and intentions, the public placed a high value on developing mental discipline and intellectual capacity, mastering basic computational skills, understanding mathematical concepts, solving problems and becoming critically numerate as important aspects of the teaching and learning of mathematics. Their paper highlights the fact that regardless of the extent to which members of the general public might seem to be dependent on media discourse, they are not simply passive recipients of the news. Individuals use their own experiences, stories and world-views to make sense of what is reported.

In the second paper, Troels Lange reviews the news discourse that surrounded the substantial changes made by the Norwegian Minister of Education to the early childhood teaching of mathematics—a change that entailed a transition from a space in which children and teachers ‘learn to be, to know, to do and to live together’ to a space in which the children were expected to reach pre-defined levels of mathematical development. He examines the notion of ‘common sense’ and the ‘ideological work’ of the media in problematizing this change to the order of mathematics teaching and learning in kindergarten. He also explores the role of the media: the Minister used specially commissioned reports and media releases to redefine common-sense understandings about mathematics education in kindergarten. Lange examines 12 media releases that included the terms *barnehage* (kindergarten), *matematikk* (mathematics) and *realfag* (the sciences), which were the focus of the report commissioned by the Minister. Using Edelman’s understanding of political spectacle, he highlights how news reporting created politically useful ambiguity in the process of characterising as common sense what was actually a deeply ideological position. Predominantly using the elements of (1) language and discourse; (2) the characterisation of events as crises; and (3) a tendency to cover political interests under a guise of rational policy analysis, he points to the media as mediators of the political spectacle. He also identifies the discursive means used in press releases to frame a key policy initiative as a rational and responsible answer to a problem in education. The promotion of the problem and the construction of the solution will have a significant impact on the way in which early childhood education and care is undertaken in Norway.

In the third paper, Keiko Yasukawa examines the role played by the media in the policy-making process in Australia, specifically through news reports of the Survey of Adult Skills (SAS) and in the Adult Literacy and Lifeskills Survey (ALL). She compares the Australian media coverage of the SAS with the media coverage of the first-wave SAS results in Japan, France and the UK. Using socio-materialist theoretical resources drawn from actor network theory, she shows how the news media tends to confine debates related to large-scale assessment, in particular by restricting the boundaries of discourse, and thus acts as a powerful policy-making actor. Using the search terms ‘Survey of Adult Skills’ or ‘PIAAC’ (the acronym for its formal title ‘Programme for the International Assessment of Adult Competencies’), she selected 13 media reports from 1 January 2013 to 31 December 2013. She demonstrates a strong understanding of how actors—both human and non-human—have a strong role in mobilising a policy network. She identifies numbers (produced by the international assessment tests) as a non-human actor, one that is representative of national pride or shame. Her paper also illustrates how the newly mandated Labor Government in Australia utilised media reports of the ALL results—characterising these reports as evidence of a ‘crisis’—to justify undertaking an urgent policy response. Yasukawa argues that media organisations can be powerful policy actors in a complex, transnational policy environment. Her paper also highlights how media discourse fulfils a multifaceted role in the production and dissemination of events and in the creation of new policies.

In the fourth paper, David Wagner examines the storylines that appear in his experiences with news coverage of mathematics education. To look closely into the stories told in the media about mathematics education, he emphasises the negotiability of storylines, using the notion of myths, by which he means the stories people use to interpret their experience. He argues that myths are powerful, with possibilities for abuse as they are common expressions of widespread belief and are culturally pervasive. He asks the important question of how myths can be overcome. He uses Barthes’ (1972/2009) analysis of rhetorical devices to examine in what ways and to what extent these myths are told about mathematics education in the news media. He identifies the devices in action as inoculation, the privation of history, identification, the other becomes a pure object, tautology, neither-norism, the quantification of quality and statement of fact.

Using a functionalist-informed orientation to the storylines, he explores what needs the rhetorical devices associated with myths address. Finally, he encourages mathematics educators to pursue opportunities to change storylines, by making their own stories heard.

In our own paper, we draw on media theories to highlight the biases embedded in the media's portrayals of mathematics and, in particular, of the teaching and learning of mathematics. We employ the concept of morality framing to examine the implicit and explicit moral dimension in news media reporting about mathematics education. Based on these ideas, we analysed a corpus of Canadian news articles on mathematics education published between September 2013 and March 2014 in three national Canadian English-language print publications. Our analyses highlight the fact that the articles in the corpus communicated a view of mathematics education that is largely premised on a false dichotomy between two caricatures of mathematics teaching, namely the 'discovery' method and 'back to basics'. In particular, we show how the storylines in these articles reflect and convey a particular set of moral values about the teaching, learning and assessment of mathematics in Canadian schools, supported by the personal stories of parents and teachers. Emotion-laden reports purport to explain why the 'discovery method' bears some of the onus for creating mathematical harm and suffering. Far from being neutral, this news reporting seemingly attaches a level of moral disgrace to the 'discovery' method based on the damage that it is alleged to have caused to the well-being of students and the nation. On the other hand, this reporting attributes morally positive qualities and outcomes to the 'back to basics' method, including its ability to contribute to the future prosperity of Canadian society.

Finally, commentaries are provided by Egan Chernoff and by Melissa Andrade-Molina and Paola Valero. Both commentaries offer pithy perspectives on the set of papers. Chernoff's take is from the perspective of a Canadian mathematics educator who has long observed and participated in media discussion of mathematics education (see @MatthewMaddux). Andrade-Molina and Paola Valero, meanwhile, adopt a rhizomatic attitude to comment on the media's crisis discourse of mathematics education and invite us to consider what good might come of it.

Taken together, all of the contributions point to the media as a powerful actor with the ability to present images that are able to influence public opinion and policy making. In the case of reporting on the various issues associated with mathematics education, media coverage does not seem to reflect the day-to-day realities of teaching and learning mathematics (e.g. using a variety of strategies and methods); rather, media coverage appears to filter and shape the public's perceptions of these realities. By focusing on some issues (like, for instance, the math war in Canada or the test results war in Australia) while ignoring other issues (like, for instance, the influence of politics, the economy and culture) and by introducing different myths, the media can lead the public to perceive some issues as being more true or more important. Examples include the attempt to define mathematics teaching with just two categories, namely the discovery method and the back-to-basics method, and the claim that a fundamental ideological change to Norway's Kindergarten mathematics education was in fact a relatively modest change.

On a deeper level, we noticed that media discourse and public opinion are complex when considered independently and are even more complex when considered as being in interaction with each other. A common theme connecting all of the papers in this special issue is their exploration of the complexity of the formation and portrayal of news about mathematics education and their exploration of the various groups, ideologies, myths and policies that affect and are affected by the production of news reports, as well as the effect of such news on the general public. For example, Wagner explores the rhetorical devices associated with myths to ask what needs they address. In our paper, we show in what ways and with what techniques the news media frames and defines distinctive perspectives about mathematics and mathematics education, as manifested through the operationalisation of moral evaluation. Similarly, Yasukawa shows how news coverage can be leveraged by the government to support its own agenda.

All of the papers suggest that media discourse reflects on and contributes to the formation of public opinion in general and of public opinion about the teaching and learning of mathematics in particular. This entails the creation of a complex web of interactions between media discourse public opinion about

mathematics education. Firstly, in their understanding of media discourses about mathematics education, individuals bring their own prior life histories, social interactions and predispositions. For example, McFeetors and McGarvey show that, regardless of the degree to which members of public might appear to be dependent on the discourse of media, they actively use the news in relation to their own experience to construct meaning and an individual position on the nature of mathematics education. Secondly, the media is itself an amalgam of many discourses that create spaces in which various social groups, institutions and ideologies struggle over the construction of a social reality of mathematics education. Both Yasukawa and Lange highlight media reports as an arena of ideological struggle and political decision-making, albeit from two distinct angles. Policy scholars have not adequately differentiated the role of the media in the policy-change process. Yasukawa theorises the media as a policy actor—a role in which media, in its coverage of large-scale assessments, provided a space on the basis of which a political party changed educational policies—whereas Lange shows how the media is used as a vehicle for the dissemination of a particular policy preference. The point here is that we should not fall into the trap of seeing media reporting, or public opinion for that matter, as homogenous. In our own study, for example, while there was a clear discourse of ‘discovery learning’ and ‘back to basics’, some news reports drew on alternative categories and assumptions.

In conclusion, the contributions to this special issue combine to underline a good deal of consistency in the role of the media in constructing mathematics education in different ways and for different purposes. At the same time, these studies add nuance and detail to different aspects of this overall picture, with new insights into the interaction of media and policy-making, the moral dimension of media stories, and consumers’ complex responses to these stories. And the voices of mathematics educators are among the most overlooked.

Where Do We Go from Here?

In the opening to this introduction, we cited a news article that appeared in the course of the Ontario general election. What is interesting and relevant for this special issue is that for the *Toronto Sun*, ‘back to basics’ is assumed to be not only familiar to people but also common sense, since it used this expression (and concept) to sum up Doug Ford’s policy announcement. It seems that such media characterisations are well-entrenched, perhaps due to the amount of coverage they have received in the past. If media discourse is fairly entrenched, however, and in a way that constructs a simplistic portrayal of mathematics education, the question arises of how mathematics educators can insert themselves into the space.

We believe that an important first step is to understand better the nature of media discourse about mathematics education, and its role in forming public opinion and government policy responses. We hope that the papers collected in this issue contribute to this goal. More than this, however, we also need to pay attention to our own assumptions. In particular, there is a need to explore our epistemological assumptions: if not, we mathematics education researchers merely become the child shouting that the emperor has no clothes while failing to explore our own role in the weaving of those clothes.

With respect to a better understanding of the nature of media discourses, all of the papers in this special issue examine narratives in the news media, with a focus largely on printed media, including newspaper articles and comment threads, as well as government policy statements. There is little analysis of television or radio news coverage of mathematics education, despite these media being more pervasive and immediate in their framing of the issues. Research on media coverage itself needs to look in more depth at the relationships between different parts of the discourse network (to borrow Yasukawa’s perspective). For example, much media coverage includes quotations or direct contributions from a variety of actors, including parents, politicians, university mathematicians and, sometimes, mathematics educators. It would be valuable to understand in more depth how such voices come to be included (and why other voices are not included), a topic that would require a rather different research design to the textual analyses present in this

issue. Such a topic might require interviews with the participants, for example, as well as with the producers of news, such as new reporters and editors. Similarly, it would be valuable to understand the policy-news interaction on a human level, to get a better sense of how different discourses filter through public servants and political operators to influence ministerial decisions.

With respect to paying attention to our own assumptions as mathematics educators, we should not forget that we have our own discourses and our own narratives about learning and teaching mathematics. These discourses emphasise, for example, the importance of mathematics as a tool for thinking, mathematics as an important way to work on social, political or ecological concerns and mathematics as having a direct connection with the lives and experiences of children. Many of us seem to share ideologies, values and perspectives about mathematics and mathematics education that appear to be fundamentally in opposition to those portrayed by the media. Decades of research underlines the role and effect of culture, society, history and politics on mathematics education. Issues such as identity, equity, ethics and beliefs and motives are largely ignored by the media. Many of us do not view mathematics as a set of truths and procedures to be transmitted to children, whether through a ‘discovery’ method or through basic skills. Similarly, research on ethnomathematics, the history of mathematics, critical mathematics education and the role of mathematics in perpetuating social injustice has grown in importance in recent years. So, we ask, does evidence matter? And how? And to whom?

The work in this special issue is a contribution to the modest amount of research on media discourses of mathematics education. We believe that the five papers show the rich potential and indeed the urgent need for more research on this topic. A challenge for our community is how to draw on empirical research findings to participate in news reporting about our field. There is an important underlying issue here: should mathematics educators try to insert an alternative set of assumptions and values into public media discourses, or should we try to participate in a dialogue with the currently more visible discourses that are already out there? McFeetors and McGarvey’s paper is helpful with respect to this question. While they found that ‘our research has either not reached the public or has not been sufficiently informative to alter perceptions’, they also found that commenters (i.e. members of the general public) displayed more complex positions than the news articles to which they referred. It seems that the news media may not be entirely successful in telling the public how to think, but it is quite successful in telling people what to think about. Perhaps there is space, therefore, for ideas from our research community to be introduced. Following Wagner’s recommendation in this issue, we need to think about how to offer alternatives to the myths portrayed by the media. And to do that, we need to learn how to turn the decades of research on mathematics education into compelling media stories.

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