

## STORYLINES IN NEWS MEDIA TEXTS: A FOCUS ON MATHEMATICS EDUCATION AND MINORITIZED GROUPS

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*We identify storylines about youth from minoritized cultures and/or languages in Norwegian news media to identify positionings made available to migrated and Indigenous mathematics students in this public discourse. Our search from 2003-2020 in a Norwegian media database including newspapers, journals, tabloids, etc, identified 1896 articles, reduced to 96 for relevancy. These storylines were identified: ‘The majority language and culture are keys to learning and knowing mathematics’, ‘Mathematics is language- and culture-neutral’, ‘Minoritized mathematics students are motivated by gratitude’, ‘Extraordinary measures are needed to teach students from minoritized groups mathematics’, ‘Students from minoritized groups must put in extraordinary effort to learn mathematics’, ‘Students from minoritized groups’ mathematics achievements are linked to culture and gender’, and ‘Students from minoritized groups underachieve’*

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Our investigation of news media launches the beginning of a longitudinal, participatory research project with school leaders, teachers, youth, community members, and families to understand the storylines at play and enact the ones that would position youth in asset-based ways. Mathematics education scholars have shown for decades the inequities in students’ opportunities to learn mathematics, and we are driven by this fact and focusing on the Scandinavian context because this issue has become more pressing with recent migrations (Källberg, 2018; Ryan, 2019, Udir, 2018). We also know that the positionings presented in news media may affect individual students’ and groups of students’ identities (Mendick, 2005; Wagner, 2019), the relations with and expectations of mathematics education and thereby opportunities for mathematics learning and life choices. These are the reasons for us to investigate storylines about youth from minoritized cultures and/or languages in news media with the goal to identify positionings made available in this public discourse. Although we focus here on storylines in Norway, the methods and findings are relevant elsewhere. That is, news media concurrently reflects and influences public opinion on mathematics and mathematics education, and about migrated and Indigenous youth everywhere.

We here use the word *minoritized* for the groups and youth we are interested in. We note here that we are aware that any wording contains possibilities for misunderstanding, possibly stigmatizing or are unfamiliar for the people themselves. The alternatives—*nondominant*, *minority*, *othered*, *non-Norwegian*, *multicultural*, etc.—all rest on attributions that are not always consensual and they imply problematic power relationships.

### Storylines

According to positioning theory, people interpret their experiences through storylines – through “lived stories for which told stories already exist” (Harré, 2012, p. 198) such as for instance a coach/athlete storyline. Berman(1999) pointed out that the multiple storylines at play “are organized through conversations around various poles, such as events, characters, and moral dilemmas. Cultural stereotypes like nurse/patient, conductor/orchestra, mother/son may be called on as a resource” (p. 39).

Storylines make positions available, which could be either accepted or resisted—e.g., a parent helping a child with homework could position himself as a teacher in a teacher/student storyline. The child could resist and try to interact within a different storyline. Hence storylines are negotiable; they are reciprocal and contingent (Wagner & Herbel-Eisenmann, 2009).

#### Storylines about Mathematics and Mathematics Education in Public Media

Recent scholarship has begun to identify storylines present in news media on mathematics and mathematics education. One such storyline is *mathematics equips society* identified by Herbel-Eisenmann et al. (2016). This storyline connects mathematics with the pursuit of economic growth and national prosperity and positions students and their mathematical achievements as national commodities valued by means of global ranking systems such as PISA and TIMMS (Lange & Meaney, 2018). Yasukawa (2019) described how these rankings translate into national pride or shame. In contrast to the storyline that positions countries as competitors, the storyline *mathematics equips the individual* positions individuals as combatants in pursuit of social and economic advancement (Wagner, 2019) or as citizens equipped for collective action (Jablonka, 2003; Rodney, Rouleau & Sinclair, 2016).

#### Storylines in Norway

Although the media storylines discussed in the previous section apply to many contexts, different countries also have storylines that might be more particular to that context. In Scandinavian societies, it takes a ‘mathematics for all’ approach (Nortvedt, 2018) as for example the Norwegian national curriculum where qualities such as social justice, equity, and equal opportunities are emphasized. As stated in the introduction, however, such ideals in education and mathematics education, may not have been realized for minoritized groups in Scandinavia.

In Norwegian contexts, several groups with a different origin than Norwegian are mentioned, often with a reference to a connection to a (former) nation state. These groups are mainly seen mentioned from the 1970s and onwards when migrant workers from Pakistan, Turkey, and Morocco started to arrive in Norway. More recently immigration also comprises people from other European countries and from conflict areas in, for example, Asia and Africa (Reisel, Hermansen & Kindt, 2019). In addition to these, there are six peoples/nations of Norway (without their own nation state) that appear in the contexts we are interested in; the Kven and Sami peoples belonging to the northern part of Norway, the Forrest Finns in the South, and the non-territorial Romani, Rom and Jews. These minorities have suffered from various injustices and assimilation policies over the centuries—e.g., for the Romani people the most important measure for assimilation was that children were taken away from their families and placed in Norwegian families, later supplemented with forced sterilisation of Romani women (Kommunal- og moderniseringsdepartementet, 2015).

For our research, such context is part of the data because it provides sources of potential storylines. What people say about a country and its inhabitants are storylines. For minoritized groups in Norway there are (historically shifting) storylines, some of which several of the groups have in common. Some might be seen as positive: e.g., they are good for the labour force; are

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necessary for the growth of Norway; they produce high quality trade and handicrafts. Others are not positive: e.g., the culture and languages of the peoples are unwanted; the groups do not share with others; the groups do not comply to norms of the society.

### Methodology

This research is part of the MIM-project, that in collaboration with partners in the U.S. and Canada investigates educational possibilities and desires, here in Norwegian contexts, particularly focused on mathematics education in times of societal changes and movements. Although we focus on the Norwegian context, we recognize that these kinds of societal changes and movements impact many countries throughout the world. With these changes and movements of people, language diversity may be the most obvious challenge in mathematics classrooms, but they connect to cultural differences and conventional characteristics of the discipline. Indigenous communities have experienced linguistic and other challenges for decades as a result of colonization. Such tensions are now appearing in “ordinary” Norwegian classrooms because tensions in education are intensified by language and cultural differences in times of large migration (Cenoz & Gorter, 2010). These tensions are reflected in public news media. They are local but reflect global trends. News media reflects these trends and thus reifies them as public storylines, which impacts students’ potential positionings.

We drew on text-based mass media sources that acknowledge Redaktørplakaten, an ethical codex for publishers in Norway: including daily newspapers, weekly or monthly journals, tabloids, etc. We focused on articles published from January 2003 to September 2020 to include the time in which a new national syllabus was launched in 2004 and the discussion leading to the launch. A librarian supported our search of the Norwegian database Atekst (<http://retriever.no>) to identify articles that included words from each of three groups that represent the categories shown below with their groups of words (these are English translations of the actual words):

- A) Indigenous and migrational contexts: Indigenous, minorities, migration, immigration, Sami, Kven, Forest Finns, Romani, Jews, multilingual, multicultural, diversity
- B) Education: education, school, upper elementary, high school, teaching, pedagogy, didactics, class, classroom, teacher, student, assessment, grades
- C) Mathematics: mathematics, math, mathematics didactics, science (2 different words), economy, statistics, coding, geometry

We use positioning theory and ask: What storylines about minoritized youth and their relationship with mathematics education are portrayed in the news media articles?

To answer our question, we read the identified 1896 articles and narrowed them to 501 after removing articles deemed irrelevant to our research focus. In this reading, positioning theory focused our attention towards how a) mathematics and b) minoritized students were portrayed and positioned and how those positionings were enacted as interconnected in and across the articles. While reading the newspaper articles we noted 25 concepts which roughly expressed the positionings we were paying attention to and hence could provide preliminary grounds for storyline identification. Based on the presence of 25 concepts in the 501 newspaper article titles we selected 96 articles for further analysis. We operationalised some of the concepts into words that could be applied as search words in the freeware AntConc’s concordance tool to identify excerpts in which the words appeared. This generated 319 excerpts which we read several times and preliminarily coded in an iterative process based on the positionings we found in relation to

the search words. To identify storylines of minoritized students required us to look at how students from the dominant group were positioned too, due to the reciprocity of positioning. The process was conducted both jointly among us and individually which allowed us to compare and refine our coding. Finally, we grouped the excerpts according to the coding and re-read the excerpts to articulate the broader storylines about minoritized youth (See Table 1).

**Table 1: Storylines identified in Norwegian media and their coding.**

Final coding of excerpts	Storyline
Excerpts that explicitly or implicitly position students from minoritized groups by explaining their (lack of) opportunities in mathematics education in relation to the majority society.	<i>The majority language and culture are keys to learning and knowing mathematics</i>
Excerpts that position mathematics in relation to students from minoritized groups.	<i>Mathematics is language- and culture-neutral</i>
Excerpts that explicitly or implicitly evaluate students from minoritized groups' mathematics achievements.	<i>Minoritized mathematics students are motivated by gratitude</i>
Excerpts that explicitly or implicitly position students from a minoritized system/curriculum/teaching.	<i>Extraordinary measures are needed to teach students from minoritized groups mathematics</i>
Excerpts that position minoritized students as the ones who need to give extra effort.	<i>Students from minoritized groups must put in extraordinary effort to learn mathematics</i>
Excerpts that explicitly or implicitly explain students' (lack of) opportunities in mathematics education in relation to aspects of them being students from minoritized groups.	<i>Students from minoritized groups mathematics achievements are linked to culture and gender</i>
Excerpts that point out students from minoritized groups' (lack of) achievements in mathematics education without giving reasons.	<i>Students from minoritized groups underachieve</i>

### Results

The storylines that we identified are entangled and sometimes overlapping. Other well-known storylines in mathematics education that do not solely relate to students from minoritized groups such as *mathematics is a gatekeeper to success* were also present in the data material, either as connected to or separated from the seven storylines we identified. Some of the excerpts of texts seemed contradictory or resistant to the storylines that we identified, but they were still positioned in relation to the storylines of the article. We provide examples of each of these storylines in the next sections. All the quotes are our translations to English.

#### **The majority language and culture are keys to learning and knowing mathematics**

*The majority language and culture are keys to learning and knowing mathematics* is the most commonly occurring storyline in our data. We find it referenced by students, educators, policy makers and everyday citizens. The student, NN<sup>1</sup>, is quoted: "Norwegian is the key. If you know Norwegian, you can learn math and science as well, says NN, who will take up health subjects this autumn" (*Aftenposten*, 5 August, 2014). An educator is quoted: "They spend a year here learning different subjects such as Norwegian, English, science, social studies and mathematics. We focus mostly on Norwegian because they are immigrants" (*Arendals Tidende*, 6 December,

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2016). And policy-maker “HH in the Education Association believes much of the explanation lies in the language. Those who do not master Norwegian well enough also have difficulty keeping up with the math lessons, she believes” (*Aftenposten*, 19 September, 2007). When text in the media is not attributed to individuals in the education system, we see it as a representation of common citizen views—for example, “With poor knowledge of Norwegian, this also leads to weaker results in other core subjects in upper secondary school. Today, parents themselves must buy a Norwegian mathematics book in order to be able to assist their children which shows that we are ‘astray’ in Sami school policy” (*Finnmark Dagblad*, 19 November, 2008)

There is, however, some recognition of complexity in this storyline. The fact that this complexity needs to be explained also reminds us that the simplistic storyline is dominant. For example, a teacher is referenced here: “[EL] has experienced that foreign language students have had great difficulty understanding professional language, even though they cope/do well with the [majority] language in daily life” (*Kommunal Rapport*, 26 October, 2005). Both complex and simplistic versions of the storyline suggest a competition that is set in a storyline of limited resources. For example, the questioning of the value of the Sami language: “There has been too much focus on Sami textbooks in all subjects which has harmed the quality of language subjects and mathematics for the students” (*Finnmark Dagblad*, 6 November, 2008). This storyline positions minoritized groups’ languages and cultures as irrelevant or unwanted. Despite the evidence that minoritized groups’ languages and cultures are resources for mathematics learning (Huru, et al., 2018; Planas & Setati-Phakeng, 2014), this is still a prevailing storyline.

#### **Mathematics is language- and culture-neutral**

*Mathematics is language- and culture-neutral* is a storyline that is well-known in mathematics education (e.g., Wagner & Herbel-Eisenmann, 2009) but has not been analyzed in news media. The storyline appears contradictory to other storylines we identified, including *the majority language and culture are keys to learning and knowing mathematics* and *students from minoritized groups’ mathematics achievements are linked to culture and gender*. The storyline appears explicitly, as in “mathematics and physics are the subjects where the cultural barriers are least/smallest. They are universal subjects” (*Aftenposten*, 3 May, 2010). The storyline also often appears tacitly, for example, visible by pointing to the fact that other subjects are language and culturally rich: “You do not need to learn much more than ‘open up’ in a new language, smiles dental student [AAY] (35) who originally comes from a Kurdish area in Turkey” (*Osloby*, 10 April, 2014). Another example of this storyline being represented comes in the newsworthiness of culturally-based mathematics programs, which would not be newsworthy if the public recognized the cultural aspects of mathematics: “They pointed out that Sami culture must be the starting point for teaching and not just a supplement. ... They first arranged a culture-based mathematics day at several grade levels, which was so successful that they also arranged a culture-based oral exam in mathematics” (*Finnmark Dagblad*, 5 March, 2014).

#### **Minoritized mathematics students are motivated by gratitude**

The storyline *minoritized mathematics students are motivated by gratitude* is a tacit storyline that appears in positionings of obligation, gratitude and benevolence. This storyline is closely entangled with a storyline about the ‘grateful immigrant’ which imposes certain societal behaviours, expectations and obligations such as willingness to work hard, gratitude to the host nation and unwillingness to be a burden to the state resources (Schwöbel-Patel & Ozkaramanli, 2017). It suggests that the model student from a minoritized group must excel in education, contribute to labour, and display vulnerability and weakness to honour the benevolence and superiority of the host county’s culture (Thiruselvam, 2019).

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Gratitude and benevolence materialize, for example, on the 17<sup>th</sup> of May, the Norwegian National Day, when it is common for immigrant students to express their gratitude in speeches at their schools. This newspaper article reports on how an immigrant girl exclaims gratitude for her life and the opportunity to go to school in Norway as part of such celebrations. Her exclamation makes available a benevolent position for the society to inhabit, as the reciprocity of positioning requires an analogous positioning for majority culture: “‘Dear all,’ she begins, ‘I am so grateful! Thankful that I get to go to school here in Norway’” (*Haugesunds Avis*, 9 December, 2019).

This debt of gratitude implies an expectation of loyalty: “Norway has given us a safe place to be. Then we must show Norway respect back. I cannot sit still and wait. Only I can help my children to become good people, to get good jobs that will help Norway” (*VestNytt*, 28 June, 2019). To succeed and pay their debt students from minoritized groups must work harder and be more ambitious than students from the dominant group—an effort that is expected of them as part of the storyline about the grateful immigrant (Schwöbel-Patel & Ozkaramanli, 2017): “Immigrant youth have higher ambitions than the rest of the students. But they struggle at school” (*Aftenposten*, 19 September, 2007). Herbel-Eisenman et al. (2016) identified a storyline present in the public realm which imply that the main goal of mathematics education is to produce a STEM workforce. This is how mathematics equip society (Wagner, 2019) and how students from minoritized groups’ mathematical knowledge can materialize the “Norwegian dream” as exclaimed by a former Norwegian prime minister.

### **Extraordinary measures are needed to teach students from minoritized groups mathematics**

The storyline *extraordinary measures are needed to teach students from minoritized groups mathematics* is entangled with the storyline *the majority language and culture are keys to learning and knowing mathematics* because they each position students as lacking the majority language and culture. Therefore, this storyline connects to work about in(ex)clusiveness and positioning of students from minoritized groups as the deficit other. This positioning has been comprehensively discussed in mathematics education research (e.g., Gutiérrez, 2008; Källberg, 2018). Here, the reporter notes that teaching in multilingual classrooms requires extraordinary measures: “The math teacher speaks clearly. He paced off and showed with his whole being how they can calculate the area and volume of the classroom. The large differences in knowledge in the class require a little extra from the teachers” (*Bergens Tidende*, 26 November, 2018). To a professional teacher these two teaching strategies may appear mundane, but the reporter communicates them to the public as newsworthy and thus extraordinary. The positioning of the “large differences in knowledge” is not about valuing knowledge as a resource but indicates that it is extra work for a teacher because dominant knowledge is what matters most. This storyline also intersects with the *gratitude* storyline as the benevolence of the society materializes in extraordinary measures on policy levels: e.g., introduction classes, summer schools, special language programs, and national syllabuses for Sami students. These special measures position additional languages (additional to the two Norwegian standard written varieties *Nynorsk* and *Bokmål*) as problems rather than resources, which is a phenomenon of interest in multiple contexts of mathematics education (e.g., Planas & Setati-Phakeng, 2014).

### **Students from minoritized groups must put in extraordinary effort to learn mathematics**

In contrast to the storyline above, *students from minoritized groups must put in extraordinary effort to learn mathematics* says that students from minoritized groups work extra hard and put in more effort to learn and perform well in mathematics. One student is quoted “I go for the best

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possible grades. In the other subjects, I can read most things, but in mathematics I have to understand all the concepts” (*Aftenposten*, 19 September, 2007).

Some migrant students go to community-governed extracurricular Saturday schools to do better at the compulsory school: “Principal DD says the Saturday school did not come about because the children learn too little at the regular Norwegian school. But they need someone who pushes them further, and here they learn a culture to work, he says. (*Bergens Tidende*, 27 December, 2015). Some migrants volunteer to help fellow migrant students to pass compulsory school courses in mathematics: “MM (16), who is very good at math, helps the less experienced SS. The talk goes. In both Somali and Norwegian.” (*Bergens Tidende*, 26 November, 2018). Additionally, the schools offer extra courses: “Many of the students at TT spent the last holiday week closing knowledge gaps in mathematics in the transition between lower secondary school and upper secondary school. (*Arendals Tidende*, 14 August, 2018).

Lastly, a migrated student offers advice: “If you have to choose; should the kids master math, or should they master Nynorsk [the non-dominant Norwegian standard variation]? Make a priority, because there is a real need to spend more time on mathematics, Bokmål [the dominant Norwegian standard variation] and so on. Subjects we actually need later in life.” (*Altaposten*, 23 May, 2018). This storyline intersects with the gratitude storyline: students themselves recognize the extra work that is expected (Schwöbel-Patel & Ozkaramanli, 2017).

### **Minoritized students’ mathematics achievements are linked to culture and gender**

The storyline *minoritized students’ mathematics achievements are linked to culture and gender* is often present in communication acts in the media which refer to statistical surveys. Roughly this storyline suggests that some immigrant boys fail at school and consequently in the society at large. Immigrant girls, on the other hand, are usually positioned as more successful than students from the dominant group. “Less than half of those who start upper secondary school complete on time, i.e., three years. This gloomy statistic is extra gloomy for boys with immigrant backgrounds. Only one in three with such a background gets through in three years” (*Nordlys*, 29 May, 2008). “About half of the girls with non-western backgrounds in [school name] take higher education. It is far above average and shows what a resource the students from minoritized groups are to the Norwegian society” (*Romerikes Blad*, 27 June, 2012.).

This storyline is connected to other storylines involving cultural superiority and inferiority stereotypes: “[NN, MM and PP] won the math competition. 16 of 38 finalists had a background as students from minoritized groups, as did six of nine winners. [...] Researchers believe this is due to the fact that math has a higher status in Asian countries” (*Aftenposten*, 3 May, 2010). “Many are positively surprised that a boy from Eritrea can do so well. The fact that people are surprised motivates me a lot to continue to work hard” (*Innherred*, 18 August, 2018). This storyline intersects with racial narratives about academic ability (Shah, 2017).

### **Students from minoritized groups underachieve**

The storyline *students from minoritized groups underachieve* intersects with the storyline *students from minoritized groups’ mathematics achievements are linked to culture and gender* but differs because it makes no distinctions among genders and cultures and offers no causes for the underachievement. For example, “In Norway, Sweden, Belgium and France, more than 40 percent of first-generation students lack elementary math skills. This also applies to a third of the students with a background as students from minoritized groups who were born in Norway” (*Aftenposten*, 19 September, 2007).

Mathematics is a subject that stands out in students from minoritized groups’ underachievement: “The most visible is the difference in subjects such as main/chosen

Norwegian standard variety and mathematics, where immigrants got more than half a grade lower than other students. Norwegian-born students with immigrant parents have somewhat higher grades than immigrants, but on average somewhat lower than other students” (Østlendingen, 18 November, 2011. This storyline is closely entangled with and perhaps even an inevitable consequence of the storyline *the majority language and culture are keys to learning and knowing mathematics* since the majority language is a necessity for being positioned by the dominant group as knowledgeable in mathematics. Further, it relates to well-known storylines about achievement gaps among different groups (e.g., Gutiérrez, 2008)

### Discussion

Our motivation to investigate the storylines about youth from minoritized groups in the Norwegian text-based mass media sources was initiated by an urgency to understand some of the storylines and positionings that might be available in this context. This investigation is the beginning of a longitudinal project in which we are collaborating with teachers, administrators, community members, youth and families to understand what storylines they would like to have made available to them in the teaching and learning of mathematics. Drawing on a participatory design, these storylines can then be used to imagine new positionings and practices in mathematics classrooms and in schools. We started with an analysis of media to sensitize ourselves to some of the existing storylines and, thus, to recognize storylines already potentially available and shaping positionings. Our hope that our sensitization to existing societal storylines will help us, our collaborators, and hopefully others to (re)imagine and to enact storylines that position minoritized youth in asset-based ways.

Our investigation shows that minoritized youth are positioned in relation to an array of storylines that sometimes overlap, intersect or contradict each other. What strikes us about our findings is how the storylines (once again) show that the burden is put upon minoritized youth with no recognition of history, systems or structures that contribute to inequities. According to some of the storylines they are expected to work hard at learning the language and practices of school academic mathematics and also at learning the majority language. While working hard through this double learning burden, minoritized youth also carry the burden of being thankful and expressing gratitude towards the benevolence of the majority society for undertaking extraordinary measures on their behalf. Taking the storyline *students from minoritized groups underachieve* into account here suggests that minoritized students carry the burden of the majority society’s disappointment—despite the extraordinary measures, minoritized youth do not seem to meet the expected learning outcomes. Positioning theory reminds us that positionings and storylines are negotiable. This means that minoritized students’ available positionings can be renegotiated, for instance by actions that remove burdens and deficit-based storylines.

We are also struck by how contradictory language appears in the storylines. Language and culture appear to be keys to learning and knowing mathematics. Concurrently mathematics appears to be language- and culture-free. We are intrigued to further investigate how this contradiction makes its way into mathematics classrooms as one tension that becomes intensified in times of national and international migration (Cenoz & Gorter, 2010). Dealing with this tension influences how minoritized students might be positioned in asset-based ways and consequently involves actions that can remove burden.

### Note

<sup>1</sup> Two cap letters are used to pseudonym people in the data.

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