“MATHS JUST WASN’T MY THING”: STUDENTS’ RETROSPECTIVE NARRATIVES OF MATHEMATICS AS A GATEKEEPER

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Mathematics has been widely described as a gatekeeper discipline shaping students’ educational opportunities, yet less attention has been paid to how this role is experienced and narrated by students themselves. Drawing on interviews with 40 final-year upper secondary students, this study adopts a situational and narrative approach to explore how mathematics emerges as a gatekeeping mechanism in students’ retrospective narratives of upper secondary school choice within the Italian educational system, characterized by differentiated pathways. Findings illustrate how mathematics becomes meaningful in students’ accounts through interactions with significant others, as its gatekeeping function emerges within situated processes of meaning-making rather than being assumed in advance.

INTRODUCTION AND THEORETICAL BACKGROUND

Mathematics has long been described as a gatekeeper discipline, that is a subject that regulates access to educational pathways and, consequently, to social and economic opportunities (Stinson, 2004). Success or failure in school mathematics often functions as a decisive criterion for advancement in education and entry into prestigious and well-remunerated professions. As Wagner (2021) notes, while some gatekeeping mechanisms are explicit, such as the requirement to excel in mathematics to pursue careers like medicine, the more pervasive and powerful effects lie in the countless, less visible ways in which mathematics mediates nearly everyone’s educational experience. Through assessment practices centred on easily measurable skills, such as algorithmic performance and memorization, a particular form of mathematics acquires social power, shaping who is recognized as capable and who is not.

The gatekeeping role of mathematics is neither accidental nor recent. Its roots can be traced back to classical philosophy, notably Plato’s distinction between mathematics as a practical tool for everyday transactions and a higher form of mathematical study reserved for those deemed “naturally skilled in calculation” (Nolan & Graham, 2015). This distinction marked the emergence of mathematics as a privileged discipline, capable of elevating some learners while excluding others. Stinson (2004) argues that mathematics has functioned as an exclusive instrument for stratification, effectively nullifying the promise of equal opportunity. Importantly, this perspective does not seek to debate whether mathematics should act as a gatekeeper, but rather to make visible its existence as such within contemporary educational structures. Central to this

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critique is the recognition that not all students are provided with a "key to the gate". Despite widespread reforms and pedagogical innovations, mathematics remains the primary gatekeeper to future educational and occupational opportunities, often in ways that appear neutral while reproducing social inequalities (Noyes, 2009).

From a situated perspective on learning, the gatekeeping function of mathematics cannot be understood solely because of individual ability or cognitive competence. Learning is instead conceived as changing participation in communities of practice, where knowledge and mathematical self-identity are co-constituted through interaction with others and with the institutional and cultural contexts in which learning takes place (Boaler, 2000). From this viewpoint, mathematics is not a context-free discipline; rather, how it is taught, assessed, and talked about profoundly shapes how students come to understand and use it. Even pedagogical approaches that encourage students' agency and exploration may retain subtle gatekeeping mechanisms, as teachers ultimately hold the authority to legitimate or reject students' mathematical productions as "proper" mathematics (Nolan & Graham, 2015).

While the gatekeeping role of mathematics has been extensively discussed in mathematics education research, less attention has been paid to how this role is experienced, reconstructed and narrated by students. Lykkegaard and Ulriksen (2016), using a mixed-methods approach to examine upper-secondary students' motivations for pursuing STEM pathways, found that quantitative and qualitative data revealed different, and at times contradictory, results thereby underscoring the need to encourage the development of qualitative and students-centred research.

This study is part of a broader research project on students' experiences of mathematics, which involved students in the final year of upper secondary education to capture reflective accounts of their school trajectories. In this paper we focus on students' narratives about their choice of upper secondary school, within the Italian educational system that is characterized by early tracking and strong differentiation of educational pathways. Investigating these narratives is crucial for moving beyond abstract critiques and for informing educational practices and policies that aspire to make mathematics a resource for participation rather than a barrier to opportunity. Adopting a situational perspective (Nolen et al., 2012) – which conceptualizes students' experience as a dynamic and socially negotiated process of meaning-making – this study examines the following research question:

In what ways do students' narratives reveal mathematics as a gatekeeping mechanism embedded in social and institutional relations?

METHOD AND RATIONALE

The Italian educational context

In Italy, compulsory schooling comprises two school cycles: an initial undifferentiated cycle from grade 1 to grade 8 followed by upper secondary education (grades 9–13), which represents the first point at which students enter differentiated educational

pathways. Mathematics is included as a compulsory subject in the first cycle and also in the first two years of upper secondary education but with a weekly timetable ranging from three to five hours, depending on the type of school. At the end of grade 8, students are required to choose among high school (*Liceo*), technical institute, and vocational school (reported in descending order of mathematics teaching hours per week). This decision is informed but formally not constrained by prior academic achievement. Previous research in sociology has shown that the choice of the type of school at the end of grade 8 in the Italian context is strongly associated with patterns of social class and gender (Panichella & Triventi, 2014) and carries significant long-term consequences for individuals' educational and occupational opportunities (Flabbi, 2001).

Upon completion of upper secondary education students are formally eligible to pursue tertiary studies regardless of the type of school attended. Nevertheless, according to the most recent data by the Italian Ministry of Education, access to higher education varies considerably: approximately 12% of graduates from vocational schools enrol in university programs, compared with about 31% of graduates from technical institutes and over 80% of graduates from academically oriented high schools.

Sample and data collection

This study draws on individual interviews conducted with 40 students (23 female, 17 male) attending the final year of upper secondary education in Italy. Participants were enrolled in four different types of schools: a humanistic high school with an economic focus (HHS), a technical institute in the biological–health field (TIB), a technical institute in the graphics–communication field (TIG), and a vocational school in the socio–health field (VSS). The selection of school types is guided by the intention to include educational pathways in which mathematics is not positioned as a central disciplinary focus. These contexts are considered analytically relevant for investigating how mathematics may become consequential for students' educational choices, even when it is not the defining discipline of the chosen pathway.

Participation in the study was voluntary and based on written informed consent; all procedures complied with institutional ethical guidelines. Individual participants were informed of the non-evaluative and confidential nature of the interviews. Individual interviews were chosen to support the elicitation of personal and reflective narratives of educational choice. Interviews were conducted during regular school hours and varied in length and depth. On average, interviews lasted 22 minutes, with the longest extending to 46 minutes. Possible variations are consistent with the study's theoretical framework, which conceptualizes the participants' construction of self-focused narratives as a central element of the interview process.

The interview protocol was structured around four main sections. The present study focuses specifically on the first section, which addressed students' choice of upper secondary school. The guiding questions for this section included: *How did you choose*

to attend this school? What initially motivated you to make that choice? Are you satisfied with your choice? This section was designed to explore students' motivations for their school choice and their retrospective reconstructions of contextual influences, including the role of significant others and relationships with specific school subjects. Only in the final part, if it had not already emerged, students were asked whether and to what extent mathematics had influenced their choice of school.

The analysis of data

Interview transcripts were initially generated using an automated transcription tool and subsequently reviewed and revised manually to ensure accuracy. Particular attention was paid to preserving colloquial expressions, slang, and dialectal features, as these elements were considered meaningful for an interpretive and student-centred analysis. The excerpts from transcripts – translated by the author – are identified by an alphanumeric code: the first three letters indicate the type of school (see the section Sample and data collection), the number indicates the progressive numbering of the transcription within the school considered, and the final letter indicates gender.

Drawing on Lieblich et al. (1998), autobiographical narratives may be examined in multiple ways, depending on the dimensions emphasized in the analysis. One such dimension concerns the unit of analysis, which can be either holistic (considering the narrative as an integrated whole) or categorical (focusing on specific segments of the narrative). A second dimension relates to the analytical focus, which may attend to the content of the narrative or to its form. The combination of these two dimensions yields four distinct approaches to narrative analysis.

In a first analytical step, narratives were organized according to the presence or absence of an explicit reference to: i) mathematics as a crucial factor in school choice, ii) significant others (such as parents, peers, or teachers) mentioned as influencing that choice. In particular, the gatekeeping role of mathematics was not assumed in advance but analytically traced through recurring narrative patterns. Subsequently, a holistic content analysis was conducted to identify the central themes characterizing each participant's narrative. This was followed by a categorical content analysis aimed at identifying possible recurring themes across the dataset. In this latter phase, the unit of analysis corresponded to participants' responses to individual interview questions.

RESULTS AND DISCUSSION

As stated from the outset, the focus of this study is not quantitative but qualitative; however, there is a numerical data worth reporting: slightly more than 61% of the respondents to the question on the role of mathematics state that mathematics played a more or less significant role in their choice of upper secondary school. In the following, the recurring and meaningful categories identified in students' reconstructions of their choice of upper secondary school are described, before they respond to the final specific question on mathematics. This approach makes it possible to understand to

what extent the role of mathematics in the choice is reconstructed by the students themselves.

The avoidance of mathematics as the primary reason for the choice. In the accounts of students from all the schools involved, we find some narrative reconstructions that identifies the limited presence of mathematics – both in terms of weekly hours and the perceived complexity of the topics – as the main reason for choosing a particular upper secondary school:

> TIB5M: The first thing, I mean, the first intention was… that I was mainly bad at maths. So, I was looking for a school where there was as little maths as possible.

> VSS2F: One reason why I chose this school is that you stop doing maths in the second or third year, I don't remember.

> HHS9F: Oh, maths had a great impact, very much, very much, because I chose this school because they told me there was little maths.

It is worthy of attention that, in the narratives collected, no other subject – except in one case (TIB3F) where the choice is described as driven by the desire to minimise the hours of both mathematics and the foreign language – is mentioned as a reason for avoidance. This highlights a worrying specificity of mathematics within the landscape of subjects taught in the Italian context: for some students, the attempt to minimise contact with mathematics becomes the primary criterion for choosing an upper secondary school, rather than vocational motivations. This is an element that underscores the relevance of studying this phenomenon within the field of mathematics education.

Self-perception in mathematics. Some narratives show how school choice is often linked to the perception of oneself as a student constructed during the first cycle of education. In a sense, for many of these students it is school failure and their own identity as student that determine the choice, rather than their passions and aspirations:

> TIG1M: I wasn't good in middle school, so I chose this school.

This issue has two particularly interesting aspects. First, the confirmation of students' "situational" reconstructions: student identity emerges as clearly mediated by comparison with reference adults, namely teachers and parents:

> VSS10F: So, mainly because I wasn't really suited to doing different kinds of schools: when in middle school they tell you you're suited for this and not for that.

Second, the perception of school failure is either global, as in the case of TIG1M, or specific to mathematics and this aspect is of great interest for our field of research. Here again, a worrying specificity of mathematics compared to other school subjects emerges: the gatekeeping role of mathematics, which was not assumed a priori in this study, appears as a recurring and specific element in the students' reconstruction. In the excerpt from TIB5M reported above, it was also evident that the motivation for a choice aimed at avoiding mathematics as much as possible is linked to a perception of

failure in mathematics. This perception, constructed during the first cycle of education, is recurrent and, in the collected narratives, has a significant impact on determining school choice by exclusion rather than by interests for a specific discipline or for the future work:

> HHS5F: When it comes to more science-oriented subjects, I'm not really cut out for them, to be honest; so I'd already ruled out a scientific track.

> VSS4F: When I had to choose my school, I already knew that maths just wasn't my thing.

The role of significant others. The influence of others has already emerged in relation to students' perceptions of themselves as learners, and particularly in how they come to see themselves in relation to mathematics. Across the collected narratives, students' reconstructions of their school choice reveal the central role of significant others in the construction and stabilization of mathematical self-images, as well as in the perception of certain educational pathways as "suitable" or "unsuitable." From a situated perspective, these accounts suggest that the gatekeeping role of mathematics operates through relational and institutional processes rather than through isolated experiences of failure.

Beyond these forms of guidance that frame some options as realistic and others as unattainable, students' narratives also make explicit the direct involvement of others in their school choice. In particular, several accounts express a retrospective awareness of how consequential this decision is, and of how difficult it may be to make such a choice independently at a young age:

> TIB5M: You're a 13-year-old kid, I mean, you're very influenced, so the first voice you hear, you're immediately convinced and steered toward that choice.

> HHS5F: They put you… when you're quite young, in front of a choice that, you know, also scares you a bit for the future. My mom helped me choose this track.

Here, two further aspects become salient. First, in some narratives, particularly those referring to family members, the influence of others is experienced as coercive:

> VSS5: I shouldn't have been at this school, I would have chosen the 'language high school', but for reasons my family said that… I'm not someone who studies a lot; so they said it wouldn't be right. In my opinion, in middle school you're not ready to choose what school to attend.

Other accounts reveal forms of retrospective awareness of some dynamics within the family that were not fully articulated at the time the choice was made:

> VSS10F: We could say that my parents seemed quite neutral at the time, but on the other hand, it looks like they also had a bit of a hand in the choice.

Second, particularly with regard to the humanistic high school included in the study, gendered patterns emerge in the influence exerted by significant others. For example, some narratives point to families discouraging girls from choosing technical or vocational pathways:

HHS12F: Well, why the high school? The high school… I don't know, maybe partly because my parents wanted me to attend a high school rather than a technical or vocational school, and so I just went along with what they wanted.

At the same time, students also recall forms of guidance from middle school teachers that oriented girls toward humanistic rather than scientific tracks, suggesting the presence of potential gender bias in orientation practices:

HHS5F: They recommended humanities to all the girls finishing middle school.

Together, all these narratives show how the gatekeeping role of mathematics is reinforced through socially negotiated processes in which family expectations, teacher guidance, and gendered norms intersect with students' mathematical self-images.

CONCLUSIONS

Adopting a situational perspective and drawing on students' retrospective narratives, this study illustrates how mathematics emerges as a consequential reference point in shaping the educational trajectories of many students. Across the students' accounts, prompted by a question about their choice of upper secondary school, mathematics frequently appears to operate as a powerful criterion of exclusion, deeply orienting educational choices away from certain options. The analysis highlights processes of self-selection grounded in earlier experiences of success/failure, and this perception may be either global or specific to mathematics. The retrospective nature of the narratives further highlights how meanings attributed to school choices may differ from those available at the time decisions were made, making visible dimensions that were implicit or taken for granted at the moment of choice.

The findings indicate that the gatekeeping function of mathematics is sustained not only through curricular and assessment practices, but also through socially mediated processes involving teachers' judgments, family expectations, and gendered norms. At least two specific and often interconnected forms of gatekeeping narratives emerged from our interviews: *anticipatory gatekeeping*, understood as a process of self-exclusion based on negative self-perception in mathematics, and *relational gatekeeping*, operating through relationships with significant others, especially teachers and family members. These findings draw attention to possible broader consequences of mathematics acting as a gatekeeper within educational systems. When students' encounters with mathematics contribute to narrowing perceived possibilities or closing off pathways, passions and aspirations, the effects may extend beyond schooling and may shape individuals' life trajectories. Viewing mathematics as a narratively mediated gatekeeping mechanism suggests that interventions aimed solely at changing curriculum or assessment practices may be insufficient, unless they also address the discursive and relational processes through which students come to see themselves as 'not mathematical'. From an ethical perspective, making these processes visible is a necessary step toward moving beyond narratives such as "maths just wasn't

my thing" and toward rethinking mathematics education as a domain that supports participation, agency, and access to future opportunities.

The study also points to directions for further research. From a situated perspective, comparative studies across different educational systems could help clarify how cultural and institutional elements shape the gatekeeping role of mathematics. Moreover, the apparent specificity of mathematics in students' narratives calls for further investigation into the role of other school subjects in constraining or enabling educational choices, as well as into why mathematics appears to function as a particularly powerful marker of capability. These directions could be pursued while acknowledging the limits of this study, focused on a single national context.

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