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Gender differences in mathematics education in prison context

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Introduction

In recent years several studies have focused on gender differences in mathematics (Leder & Forgasz, 2008) and international standardized assessments continue to confirm that male students overperform female students in most countries (e.g. OECD, 2023). This gap is closely linked to social and cultural factors, as well as stereotypes influencing metacognitive aspects of mathematics (Leder & Forgasz, 2008), and this has a strong impact also on career choices of females. This study explores gender differences in the teaching and learning of mathematics within the prison context, a setting rarely addressed in educational research and even more in mathematics education. The prison is considered a "total institution" (Goffman, 1961), which disciplines and reshapes bodies and personalities through mechanisms of control (Foucault, 1975), significantly impacting teaching processes. The promotion of cultural and professional growth during detention is a key element in fostering social inclusion.

This work is part of the Italian national project Learning Mathematics in Prison (LeMP) which investigates the conditions and challenges of teaching mathematics within a prison setting, focusing on the insights of the teachers involved. In this preliminary study focused on gender, we will consider data coming from national reports and teachers' perspective to understand which are the peculiarities of teaching mathematics to male and female students in the prison context in Italy. Thus, our research questions are: How do mathematics teachers perceive gender difference within the school prison context? How do they perceive this difference in relation to mathematics learning?

Methods

In the first year of LeMP project four teachers from the three prisons in Italy were involved in semi-structured interviews aimed at exploring their motivations and perceived roles. Interviews were conducted in one-hour online meetings by researchers; in this poster, we focus on the part of the interview aimed at discussing observed differences among students, with a focus on gender. All interviews were audio-recorded and transcribed. The researchers carried out a thematic analysis (Braun, Clarke, 2021) of the collected data, identifying recurring patterns in the teachers' perceptions of gender biases. Excerpts concerning these differences classified and collectively discussed. The analysis was supported by ethnographic tools (Geertz, 1973), such as fieldnotes, which provided contextual depth and enriched the interpretation of findings within the complex dynamics of the prison environment.

Discussion of preliminary results and further steps

In Italy, women represent only 4.3% of the prison population, a stable percentage that renders them a marginal group often overlooked in terms of educational resources and programs. Previous

schooling, future expectations, and gender stereotypes deeply shape their learning paths. Moreover, there is lack, or near absence, of data and studies addressing gender dynamics in this specific context. In the interviews teachers report significant differences in the experience of detention between women and men.

Discussing more specifically issues related to their learning experiences, teachers observed that female students often struggle with focus, influenced by emotional labor, guilt, and family responsibilities. Female students often face psychological and emotional challenges, including depression and guilt related to family responsibilities, which can disrupt attendance and engagement (a teacher said: “*They had an intermittent frequency, because sometimes they were really depressed, so they took therapy.*”). Gender biases among teachers also emerge, as they tend to view female students as more vulnerable, underestimating their abilities (a teacher noted: “*In female sections, women are often mothers, and they suffer due to guilt about being away from their children, which makes them more vulnerable*”). Teachers noted stereotypes about women's mathematical abilities and education, often framing it as preparation for traditionally female-dominated jobs (beautician, seamstress, waitress), and in which mathematics competences are not considered as fundamental. Regarding previous education, the interviews do not provide clear data, reflecting the lack of detailed information in ministerial reports on women and education in prison. Data from interviews with other teachers will be collected next year and, to go further, and get a direct perspective on learning mathematics in prison, in order to include them in designing new educational tools.

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