

# DPFS: Italian national survey on the perception of scientific practice among primary school children

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**Abstract.** In the evolving modern society, technological advancements bring opportunities and challenges. Scientific Literacy is essential for understanding and navigating these changes, fostering responsible citizenship. The perception of science shapes social attitudes, especially among young students, impacting their future choices. Concerns about declining interest in scientific careers emphasize the importance of understanding how school children perceive scientists. AgoràLAB laboratory, in collaboration with GEO research centre, conducted a study using the "Draw a Person Doing Science" task to explore children's perceptions. Preliminary findings from the analysis of 1100 drawings are presented and possible future Machine Learning applications in this research are discussed.

## Introduction and theoretical framework

In the last decades, the modern society has been strongly influenced by the rapid technological and scientific progress. Tumultuous technological developments offer new opportunities and pose social challenges; to address them, the population should be well equipped in terms of scientific literacy, in order to understand, evaluate and handle their implications [1]. Therefore, Scientific Literacy (SL) plays a crucial role in the lifelong learning processes, encouraging responsible citizenship and contributing to a sustainable future. In this perspective, the perception of science represents a key element in determining social attitudes and aptitudes towards science and technology [2,3,4]. Research into the social perception of and attitude toward science should especially include young students, since this perception can affect their approach towards the learning of scientific disciplines during their school careers, potentially impacting their future academic and professional choices and achievements.

In the last years, interest in scientific careers has been declining in many countries around the world; for this reason, the perception of science among young children (starting from primary school) represents a critical challenge in educational and scientific research. This concern is not new, early studies on the perception of science of primary school children was introduced at the beginning of the 1980s, with the so called "Draw a Scientist test" (DAST) [5]. This test has been revisited different times in the last three decades, to better capture various aspects of children's perceptions, considering factors such as gender, ethnicity, technological development, and cultural influences [6,7,8].

In this context, the *AgoràLAB* laboratory [9], in collaboration with the inter-university research centre *GEO* [10], has conducted a nationwide empirical study, based on the original DAST, with the aim of obtaining an updated characterization of “scientists” perception by primary school children, also focusing on gender issues and sociocultural contexts.

## Methods and preliminary findings

The Italian translation of the task “Draw a Scientist” could lead to a gender bias (the term “scientist” in Italian has a female and a male connotation): this led us to rephrase the instruction as “Disegna una Persona che Fa Scienza” (DPFS), literally meaning “Draw a Person Doing Science”, which has the advantage of not suggesting gender bias to the young readers.

To date, the national collaboration has collected approximately 1800 drawings, 1100 of which have been analysed with a protocol obtained through the development and updating of the various DAST studies published in the last three decades [6,7,8], basing on the original Chambers protocol (1983) [5].

In the present work, we present the DPFS collaboration and describe and discuss the updated protocol of analysis. Moreover, some preliminary results of the analysis are presented, among which the correlation between the gender of pupils involved in the DPFS test and their perception of the role of scientists, as well as the evolution of their perception across different grades of primary school. Finally, the possibility of using Machine Learning techniques in future analysis is discussed.

## References

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- [9] AgoràLAB “Laboratory for the dissemination of technical-scientific culture for citizenship in the XXI century” is an initiative based at the University of Calabria, funded by the Italian Ministry of University and Research (MUR), under Law 6/2000, ACPR20\_00229 <http://www.agoralab.unical.it>.
- [10] GEO is an Interuniversity Research Center for the Study of Youth Condition, Organization, Educational Institutions, and Guidance founded in 2000. Currently, the Center consists of a network of twelve Italian Universities (L’Aquila, Bari, Brescia, Calabria, Camerino, Milano Bicocca, Napoli Federico II, Pavia, Salento, Siena, Trento, Udine) that have long been connected for joint activities related to orientation. <https://geo.uniud.it>.