

# What letters, lines and colours can do<sup>1</sup>

Mariana R.P. Alves<sup>234</sup>

I close my eyes and try to imagine a more equitable world. There is an urgent need to exercise the creativity and courage to go beyond what is considered "normal" or "just the way it is". How can we imagine this world, and its science, in letters, lines and colours<sup>5</sup>? When a child or young person draws the way they imagine a scientist to be, in which tense or timeframe are they drawing? In the present? In the future? In "just the way it is"... or in the multitudes of what could be? We don't know, we'd have to ask them.

If you're a young person reading these words, I really want to tell you: science is also for you, if you want to - be it for your leisure time, future profession, or as a tool for thinking about the world.

I open my eyes. I look at the drawings and essays in this book<sup>6</sup> - all of them, without distinctions - and I invite you to do the same, paying attention not only to *whom* or *what* each contribution shows, but also to *what* and *who* isn't there - whether on the page or in the imagery associated with science.

**Letters.** There are plenty of drawings of white lab coats, formulas and lots of

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<sup>1</sup> Reference to the question "what can words do?", written by Maria Isabel Barreno, Maria Teresa Horta and Maria Velho da Costa in the historic book *Novas Cartas Portuguesas* (New Portuguese Letters) (1972) and which gave its title to the documentary film - which the author saw at the hands of her companions from Heróides (Cassandra) - by Luísa Sequeira and Luísa Marinho. It is important to note that original phrasing in portuguese works both as a question and as an affirmation, and uses a strong verb "*poder*" (as in what something has the power to do/achieve/accomplish) which translated to "can" might unfortunately be lightened.

<sup>2</sup> CIDTFF – Research Centre on Didactics and Technology in the Education of Trainers, Universidade de Aveiro ([www.ua.pt/en/cidtff](http://www.ua.pt/en/cidtff)); [mrpalves@ua.pt](mailto:mrpalves@ua.pt)

<sup>3</sup> Cartas com Ciência, Non-profit Association ([www.cartascomciencia.org/en](http://www.cartascomciencia.org/en)); [mariana.alves@cartascomciencia.org](mailto:mariana.alves@cartascomciencia.org)

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<sup>5</sup> This is a reference to the title of the exhibition from University of Beira Interior and the ebook for which this piece was written: "Scientists in Letters, Lines and Colours".

<sup>6</sup> The ebook can be found here <https://online.fliphtml5.com/kttlm/pvtb/#p=1>

numbers. What about scientists who work with letters? How many drawings are there of people researching literature, education, social sciences, science communication?

**Lines.** How do you draw “in pencil lines” what “in letters/words” you would write “science is also for me”? Of the 450+ young people who took part in this book, how many draw themselves as scientists? What about drawings of scientists with ‘lines on their skin’? Scientists also wear tattoos.

**Colours.** Nowadays we can find “skin tone-coloured” pencils in various shades (apart from the hegemonic beige associated with white people). This is important so that each young person can imagine themselves in drawings of future possibilities. Where are the Black<sup>7</sup>, Romani or racialised women scientists when women in science are celebrated? So that they are part of the imagery of children who see themselves in them, and can appear in drawings too?

How can one draw, in pen and paper, exclusions, barriers, violence and absences? Absences of scientists with disabilities, from low socio-economic backgrounds, trans scientists, non-binary scientists, migrant scientists, and more scientists from communities that are minoritized by a system that only values normativity - a (men) scientist who is “tall, thin, with white hair”<sup>8</sup>, who uses “complicated” or “intelligent”<sup>9</sup> words. Whether or not they appear in drawings, all these scientists exist.

When will there be fewer drawings of Einstein? More drawings of Cristina Roldão, Maria Augusta Arruda, Sara Ahmed, Pâmela Borges, Chanda Prescod-Weinstein, Shahd Wadi, Odete. And also of teams. Moving beyond drawings and poster design<sup>10</sup>, to acting, reflecting and investing in more meaningful and equitable interactions between science and scientists and society.

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<sup>7</sup> Rita Cássia Silva (2023) <https://afrolis.pt/mulheres-negras-que-sonharam-ser-cientistas/>

<sup>8</sup> This is a reference to/citation of the contribution of one pupil to the exhibition “Scientists in Letters, Lines and Colours”.

<sup>9</sup> See the book “Elas, Percursos inesperados de jovens mulheres das classes populares” (João Teixeira Lopes, 2023); free translation “Them, “unexpected” journeys of young women from the working classes”

<sup>10</sup> “If you don’t have a Black woman on your board, I’d rather not see a Black woman on your billboard” (Aurora James as quoted by Gabrielle Sheridan on LinkedIn)

Recognising the path ahead is not *in opposition to*, but actually an *expression of* celebrating this book. A collection that enables a better understanding of the perception of young people, particularly from Covilhã and neighbouring municipalities, about who can be a scientist. Drawings and essays by over 450 children and youth who had the time and opportunity to imagine scientists in letters, lines and colours. Time and opportunities not afforded to children whose schools are destroyed by gunfire or bombs - bombs which would not exist without scientists or science instrumentalised for harm - and who draw very different images<sup>11</sup>.

Each and every person within the scientific community makes decisions every day that can influence the future (drawings, inequalities<sup>12</sup>, peace). This is within our reach.

May this book inspire those who read it to take the time to close their eyes, sketching - in paper or not - a world (and its science) that is more just, one that goes beyond what the ruling classes have decided will be "normal"<sup>1314</sup>.

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<sup>11</sup> Doctors Without Borders (2024) <https://www.youtube.com/watch?v=VXpyxOdhBQw>

<sup>12</sup> See the books "Inferior" and "Superior" (Angela Saini, 2017 and 2019)

<sup>13</sup> "This is what our ruling class has decided will be normal." (Aaron Bushnell, 2024)

<sup>14</sup> "We have to constantly critique imperialist white supremacist patriarchal culture because it is normalized by mass media and rendered unproblematic." (bell hooks, Homegrown - Engaged Cultural Criticism, 2017)

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## Original version (in Portuguese)

This piece was written by invitation of the University of Beira Interior (Portugal) for an ebook (in Portuguese) that celebrates the Day of Women and Girls in Science 2024 and features drawings from pupils who were asked to draw a scientist. The ebook and the original version (in Portuguese) of this piece can be found at <https://online.fliphtml5.com/kttl/pvtb/#p=1> and <https://zenodo.org/doi/10.5281/zenodo.10775413>

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