

GENDER & DIVERSITY IN TEAM WORK

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MINOA PhD School, 24.07.2019

A FEW WORDS ABOUT ME



What do you want to take away?

- Take as many cards as you need.
- Write down one expectation/wish a card.



What to expect...

- introduction
- gain insights in how gender and diversity might impact collaborations and career trajectories
- strengthen communication skills and collaboration;



B i n g @

GENDER & DIVERSITY

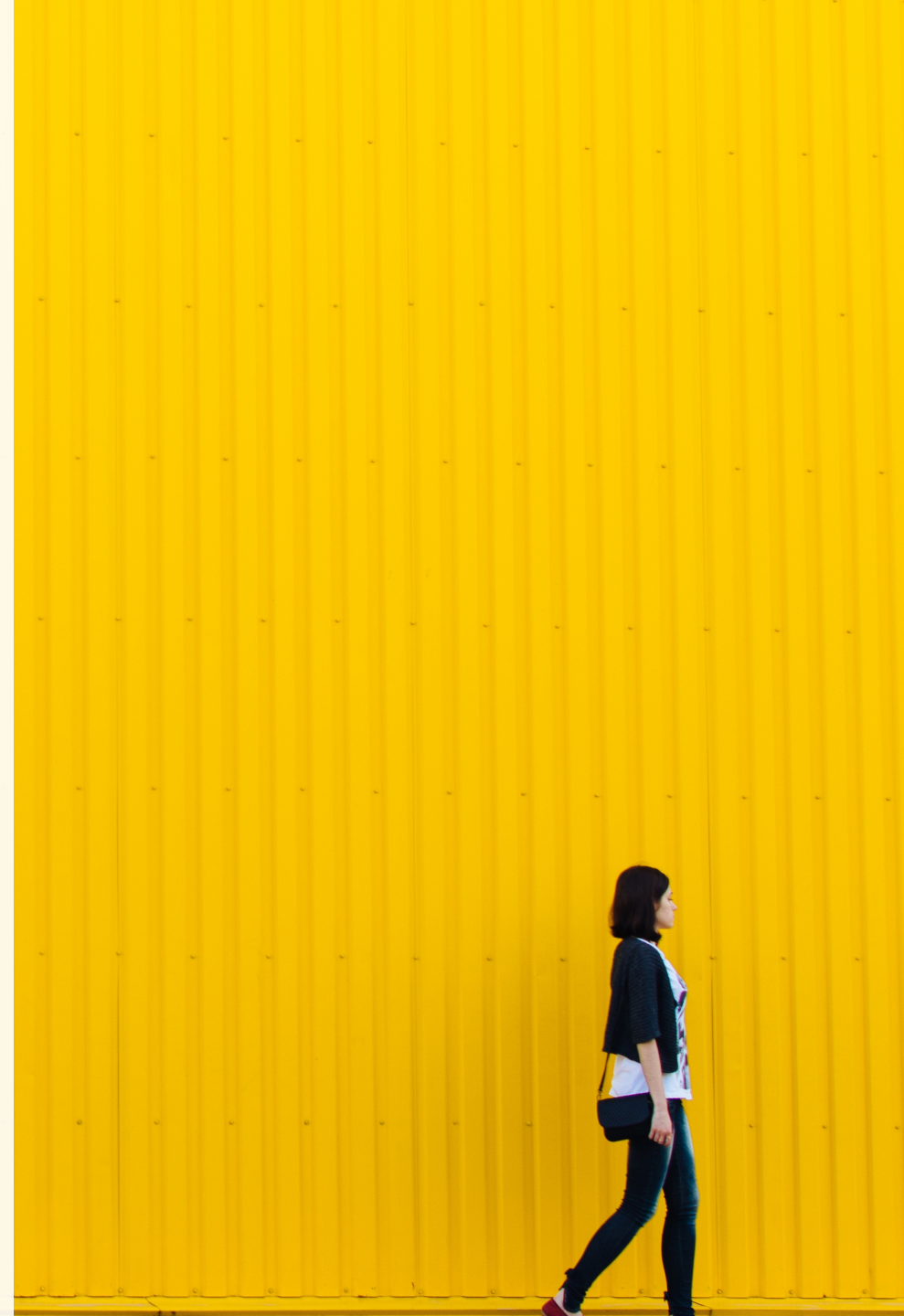
How does it show?

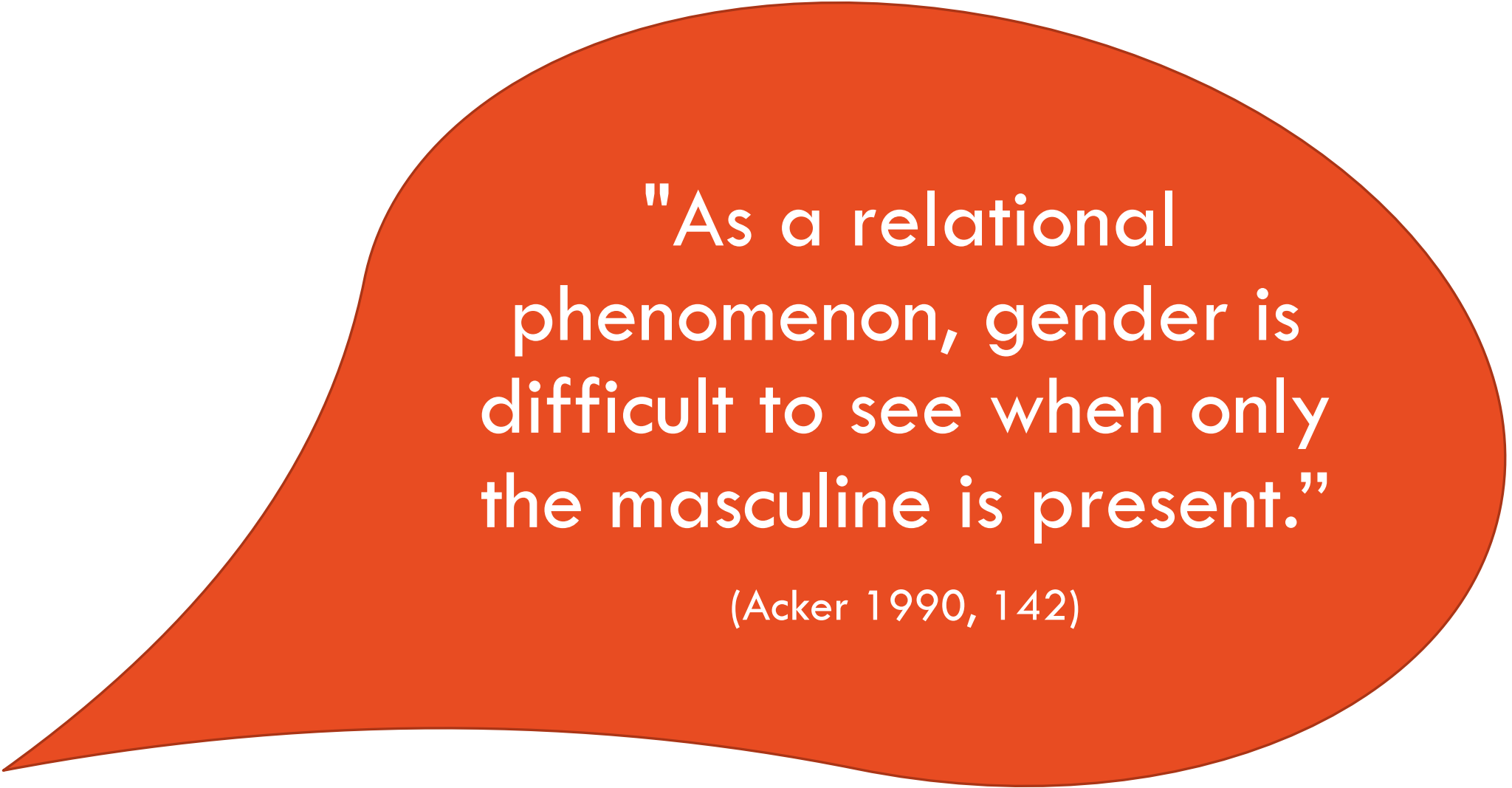
What does it mean?



GENDER — SEX — SEXUALITY

- Gender is a social practice
- Unmarked gender: men





"As a relational
phenomenon, gender is
difficult to see when only
the masculine is present."

(Acker 1990, 142)

GENDER — SEX — SEXUALITY

- Gender is a social practice
- Unmarked gender: men
- Sex refers to the body
- Co-construction of gender & sex
- Co-construction of gender & sexuality



What
does this
have to
do with
math?





Content



People

BIAS IN AI // MACHINE LEARNING

- Text mining reproduces biases (Calinska et al. 2017)
- AI can be sexist and racist (Zou, Sciebinger 2018)
 - 45% ImageNet data comes from USA (4% population)
 - Algorithm to search for skin cancer was not tested on dark-skinned people
 - As of 2016, over 80% of all genetics data are collected from individuals of European ancestry
 - Google translate has a masculine default.
 - word embeddings capture associations between words that risk perpetuating harmful stereotypes
- Flawed algorithms can amplify biases through feedback loops.

<https://genderedinnovations.stanford.edu/>

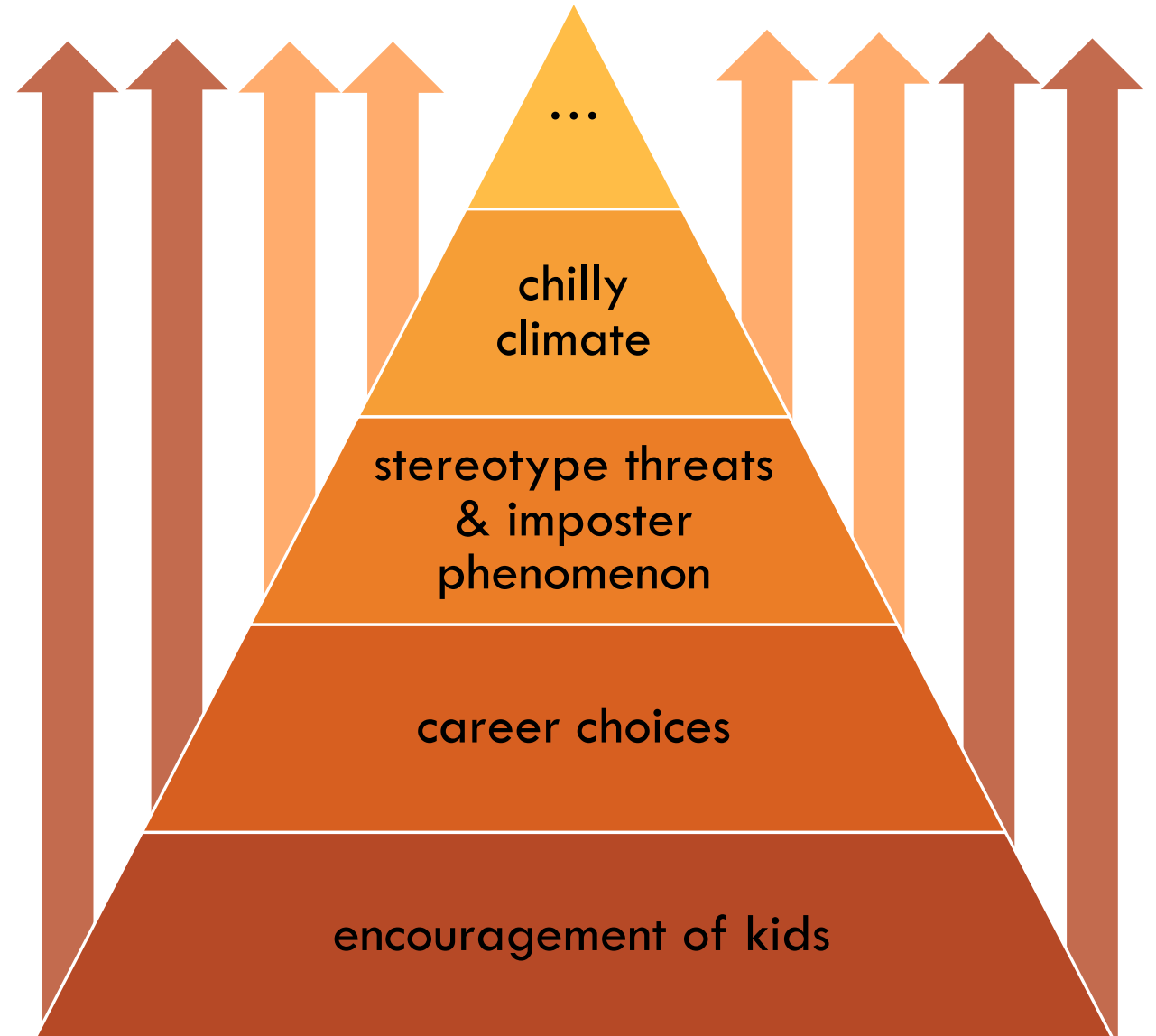
ACCUMULATION OF DIS/ADVANTAGE

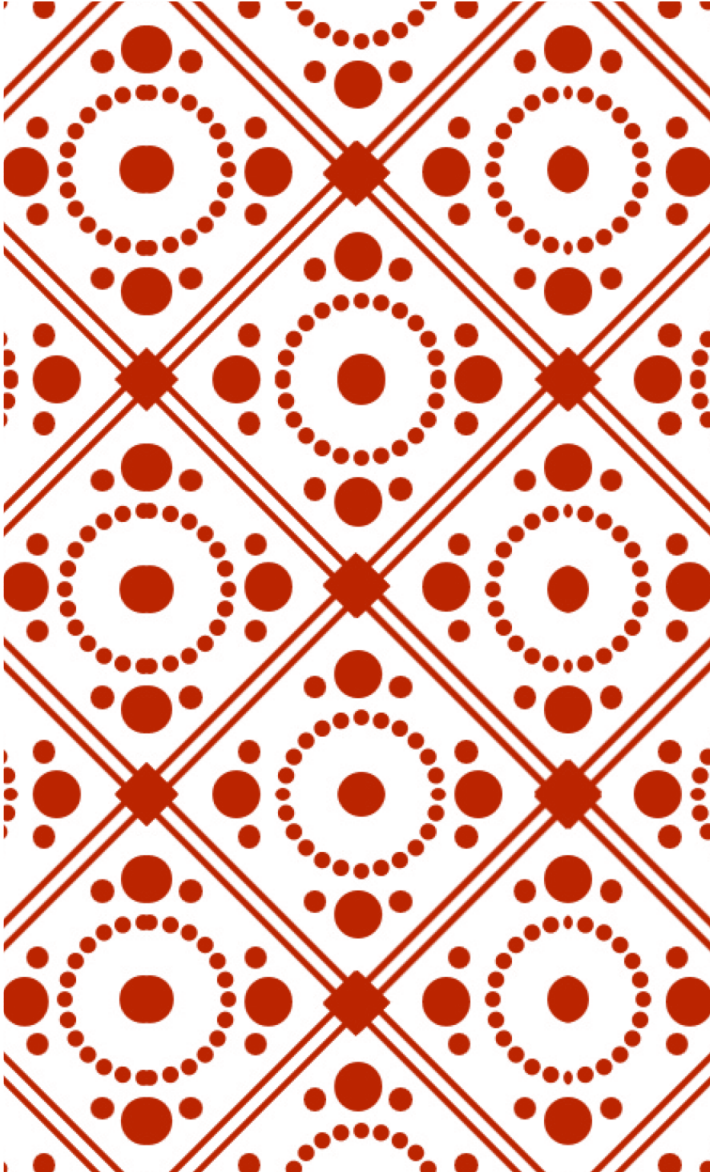
2017, EU 28:

Bachelor graduates in
math & statistics: 56% men

PhD graduates in
math & statistics: 69% men

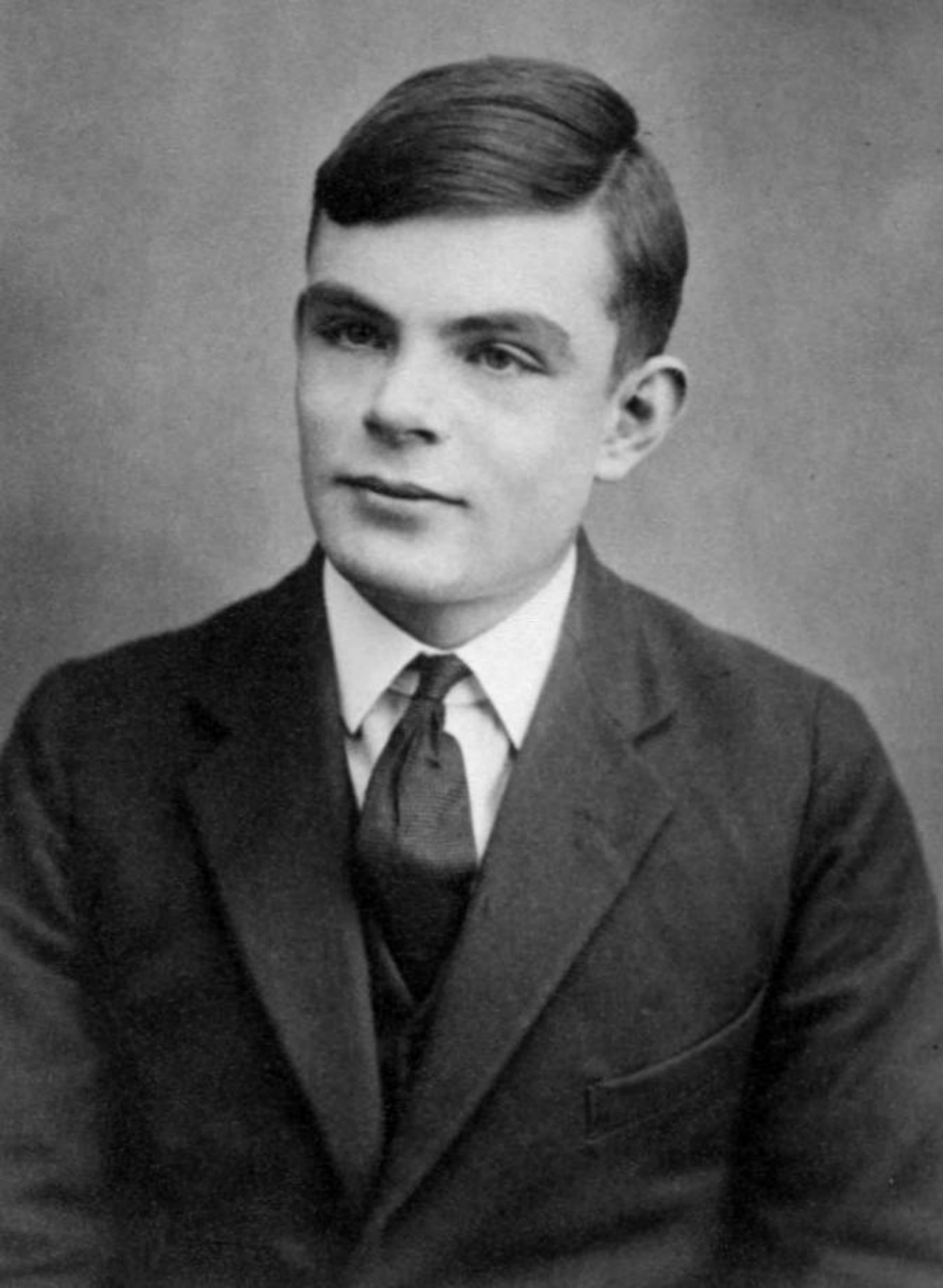
(Eurostat, [educ_uoe_grad02])





WHICH FAMOUS MATHEMATICAN DO YOU KNOW?

https://en.wikipedia.org/wiki/List_of_women_in_mathematics



Alan Turing





MORT DE LA PHILOSOPHE HYPATIE. A ALEXANDRIE.



Ada Lovelace

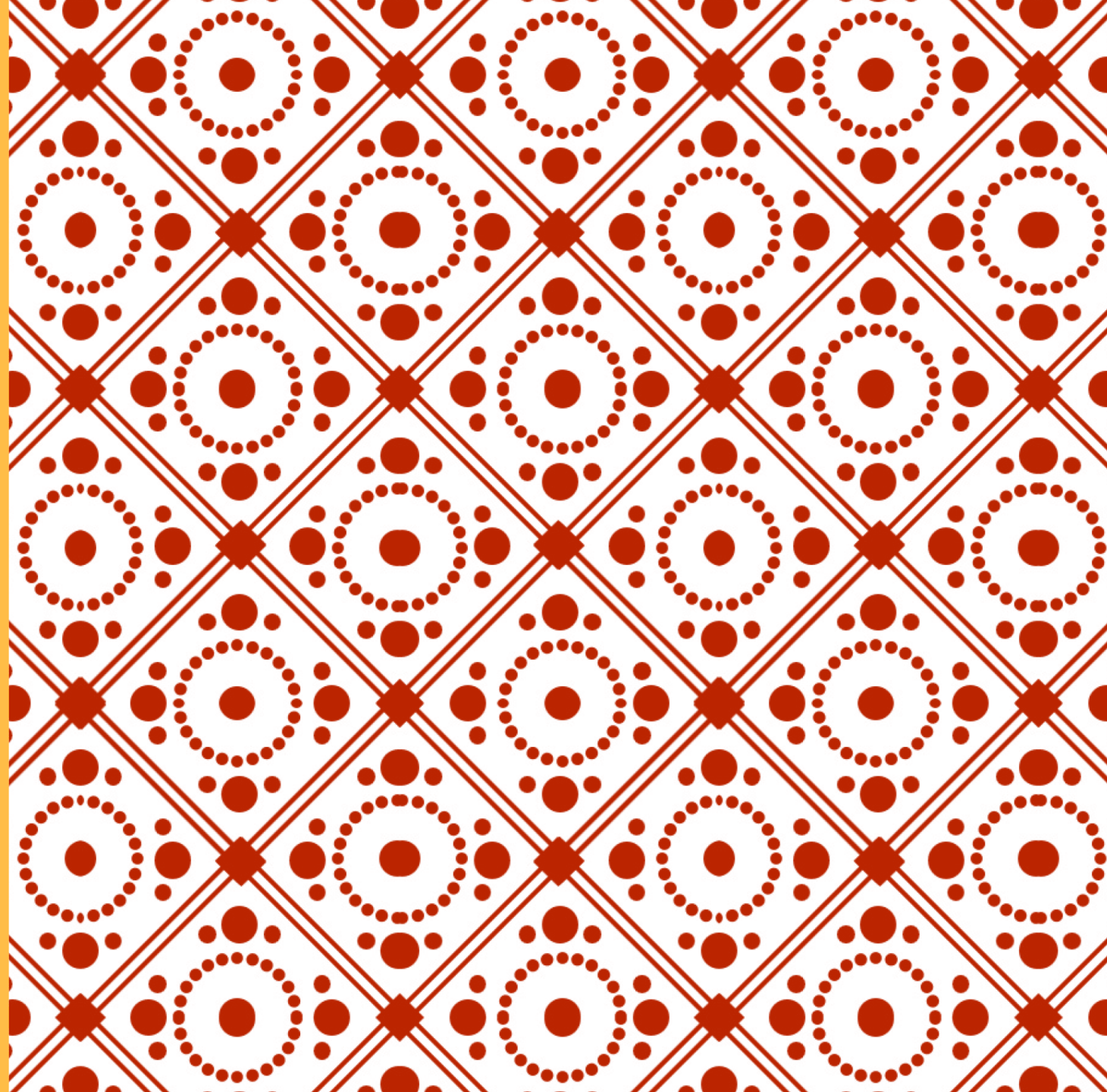


Emmy Noether

Katherine Johnson



WHAT DO YOU NEED
TO BE(come) A
MATHEMATICIAN?



YOUR OWN WAY INTO MATH....

Reflect upon your own way so far. How comes you are doing a PhD in mathematics?

- When, how/by whom was your interest in math initiated?
- What is fascinating in doing math? Did this fascination change over time? In what ways?
- How was it studying math as an undergraduate? In what way is it different now?
- Is there any person who is very important for your journey in doing math? Some one who supports you?
- Did any of my characteristics, my gender, my age, my sexuality, my race, my social background, influence my journey? In what way? And if not: would this be the same if I had a different gender?

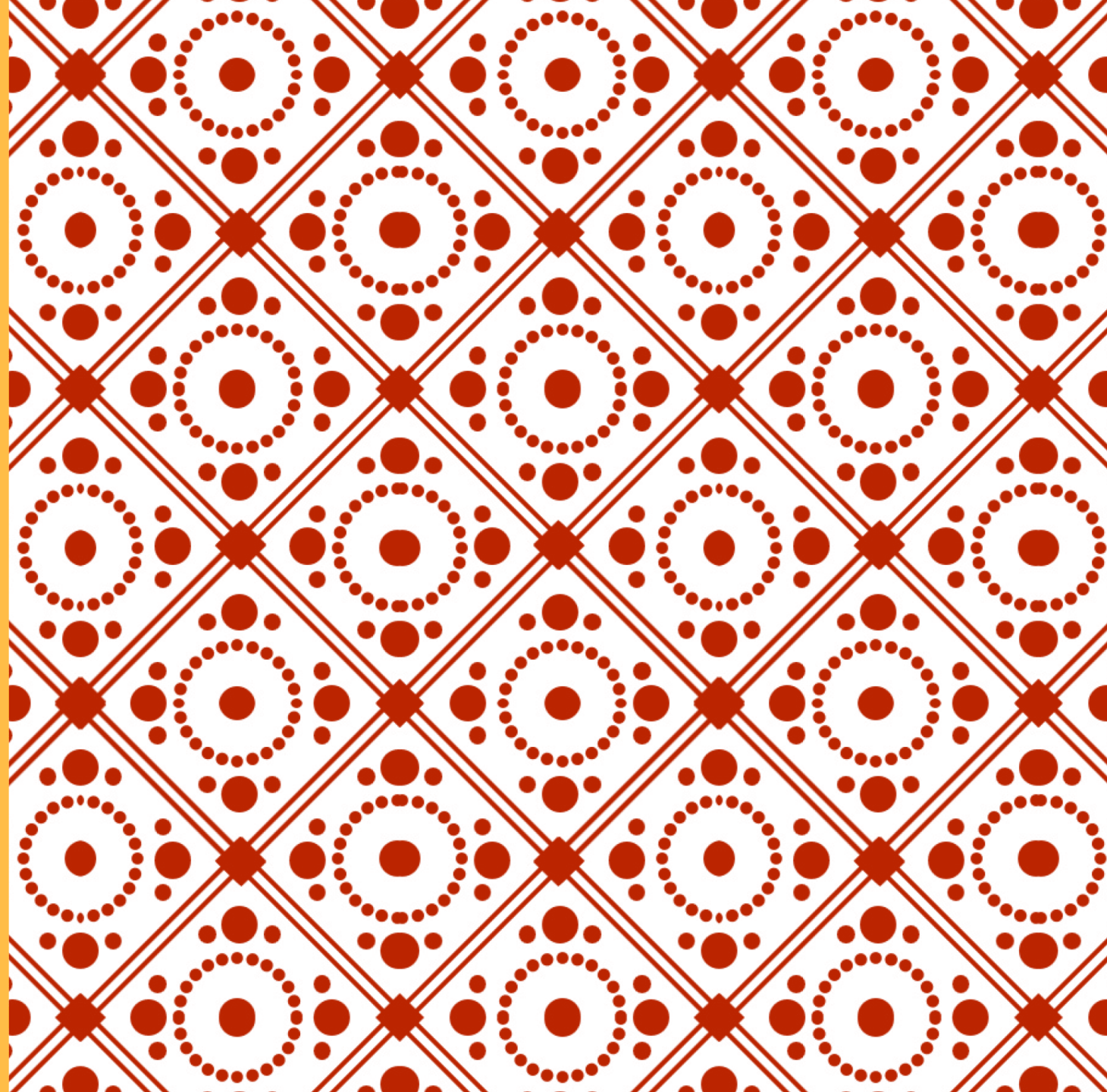


The journal entry stays with you. It is private.

WHAT DO YOU NEED TO BE(come) A MATHEMATICIAN?

Would it be different if
you had another
gender/sexuality?

Discuss in groups of 4, reflecting upon
your own journey to math





GENDER DIVERSITY INDEX

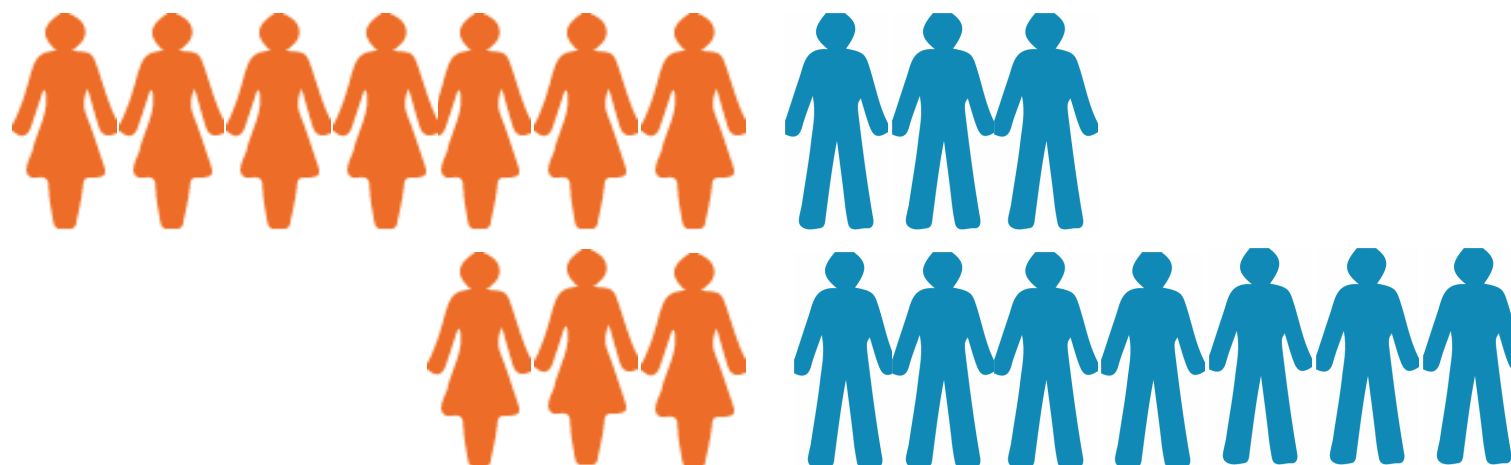
Dr Anne Laure Humbert

Dr Elisabeth Anna Guenther



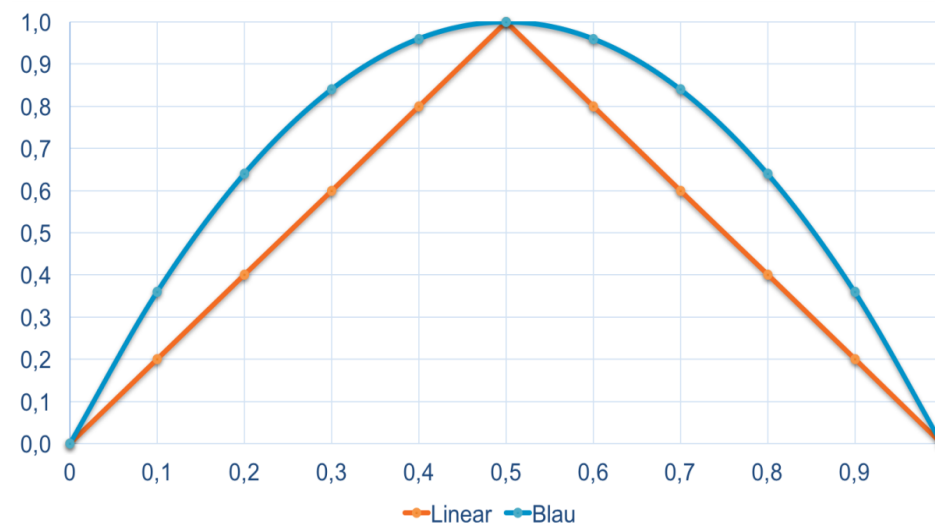
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 665851.

HOW TO MEASURE GENDER DIVERSITY?



REPRESENTATION

$$\alpha_i = \begin{cases} 0 & \text{if } w_{2i} = m_{2i} = 0 \\ 2x(1 - (w_{2i}^2 + m_{2i}^2)), & \text{otherwise} \end{cases}$$




ATTRITION

$$\delta_i = \begin{cases} 0, & \text{if } w_{2i} = m_{2i} = 0 \\ \frac{w_{2i}}{w_{1i}}, & \text{if } w_{2i} < m_{2i} \text{ and } w_{2i} < w_{1i} \\ \frac{m_{2i}}{m_{1i}}, & \text{if } m_{2i} < w_{2i} \text{ and } m_{2i} < m_{1i} \\ 1, & \text{otherwise} \end{cases}$$


INDICATORS GENDER DIVERSITY INDEX

Demographic Gender Diversity



Age	% Wo/men below/above average team age
Education	% Wo/men with/out doctorate
Marital Status	% Wo/men with/out cohabitating significant other
Care Responsibility	% Wo/men with/out current care responsibilities

Functional Gender Diversity



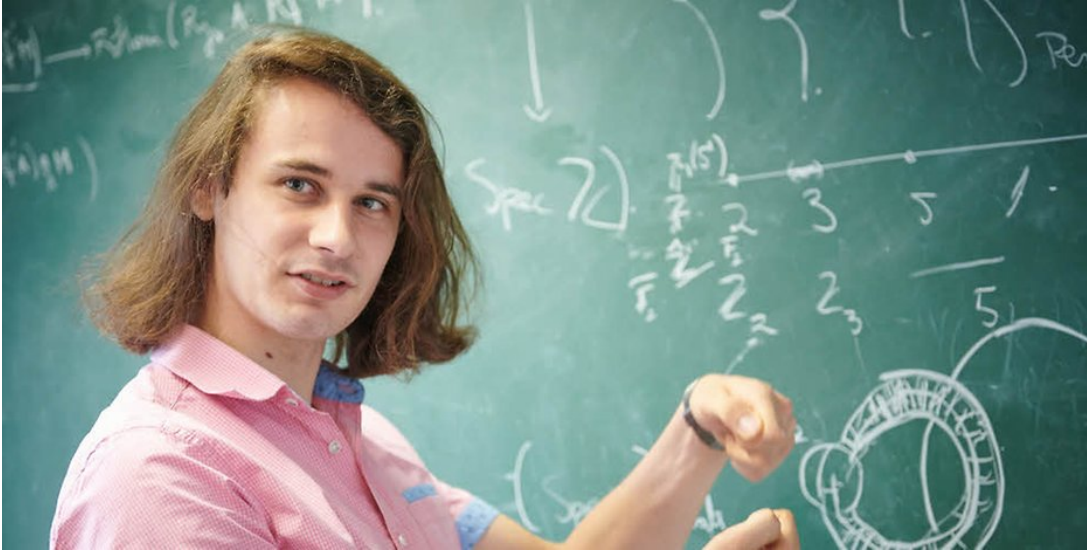
Contract	% Wo/men with/out permanent position
Team tenure	% Wo/men below/above average team tenure
Team role	% Wo/men with/out senior role

STEREOTYPES

- stereotypes impact our perception

→ bias

- Who is a good mathematician/teacher/student?
 - What competencies are needed?
-
- stereotypes cause discrimination
-
-
- stereotype threats impact performance



Peter Scholze



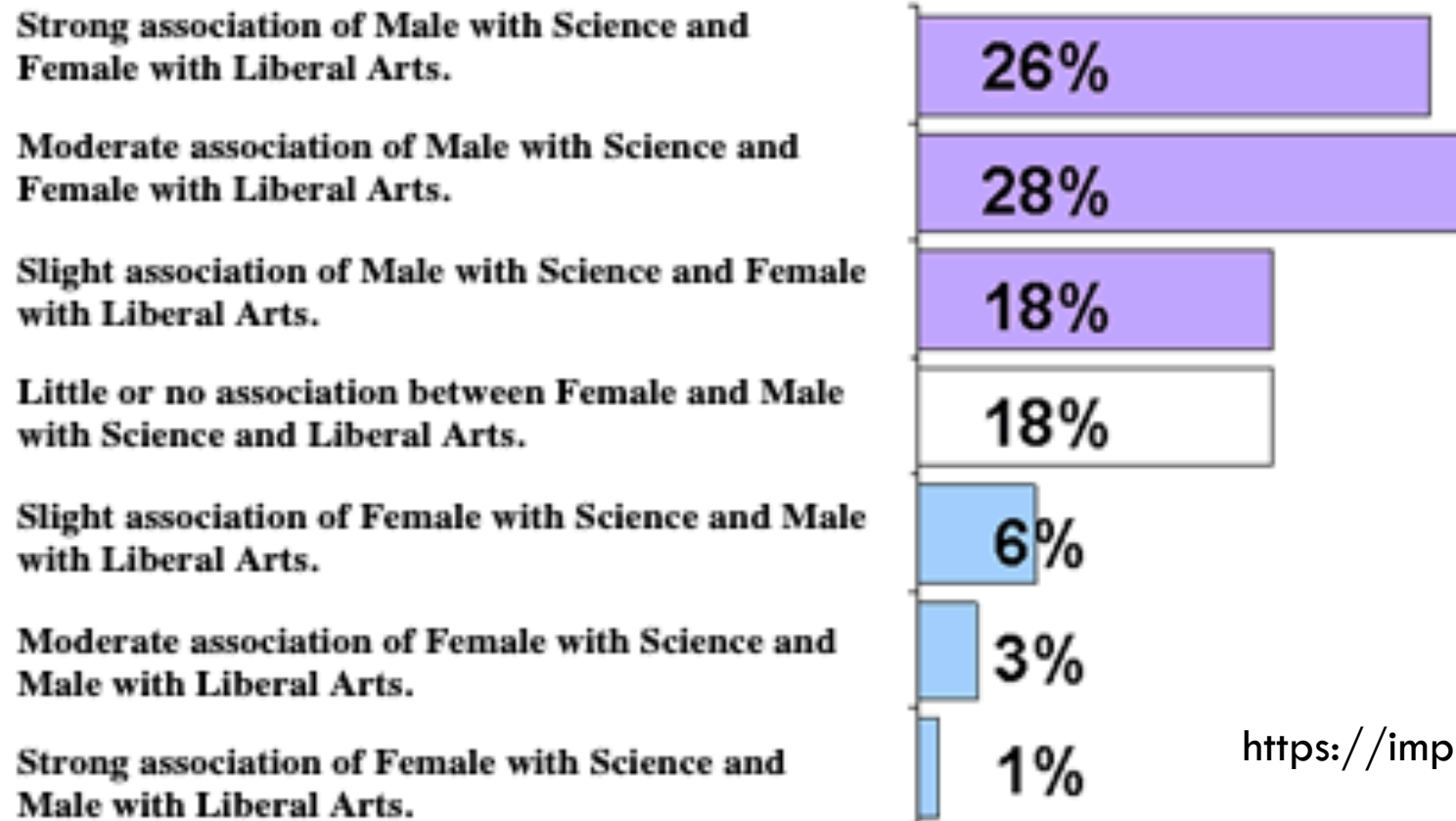
Maryam Mirzakhani

IMPLICIT ASSOCIATION TEST

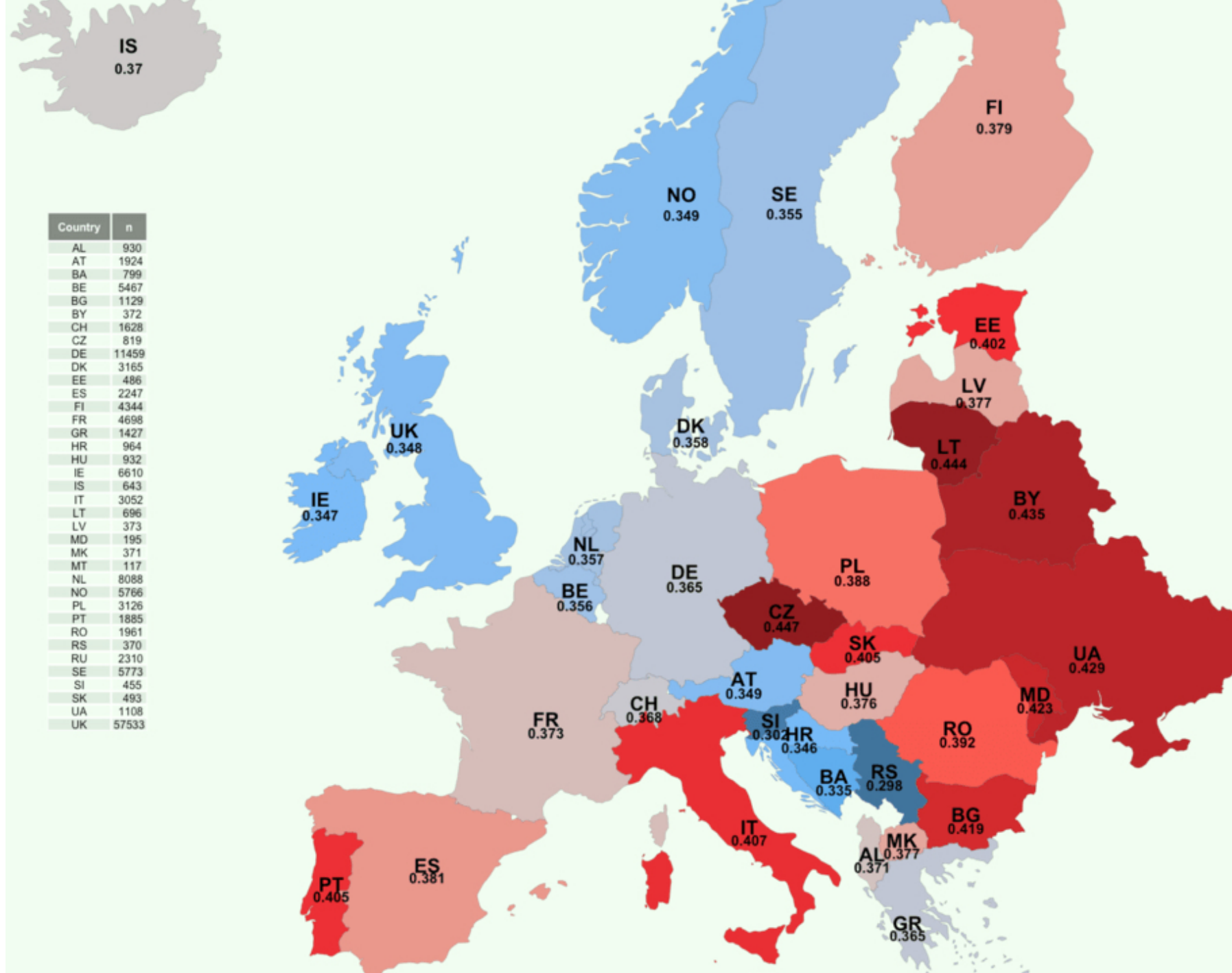
<https://implicit.harvard.edu/implicit/takeatest.html>

IMPLICIT ASSOCIATION

Percent of web respondents with each score



<https://implicit.harvard.edu/implicit/blog.html>



<https://implicit.harvard.edu/implicit/user/jaxt/blogposts/piblogpost005.html>

HOW DO YOU LIKE TO COLLABORATE

Think about key aspects that are important for you to collaborate with other people.

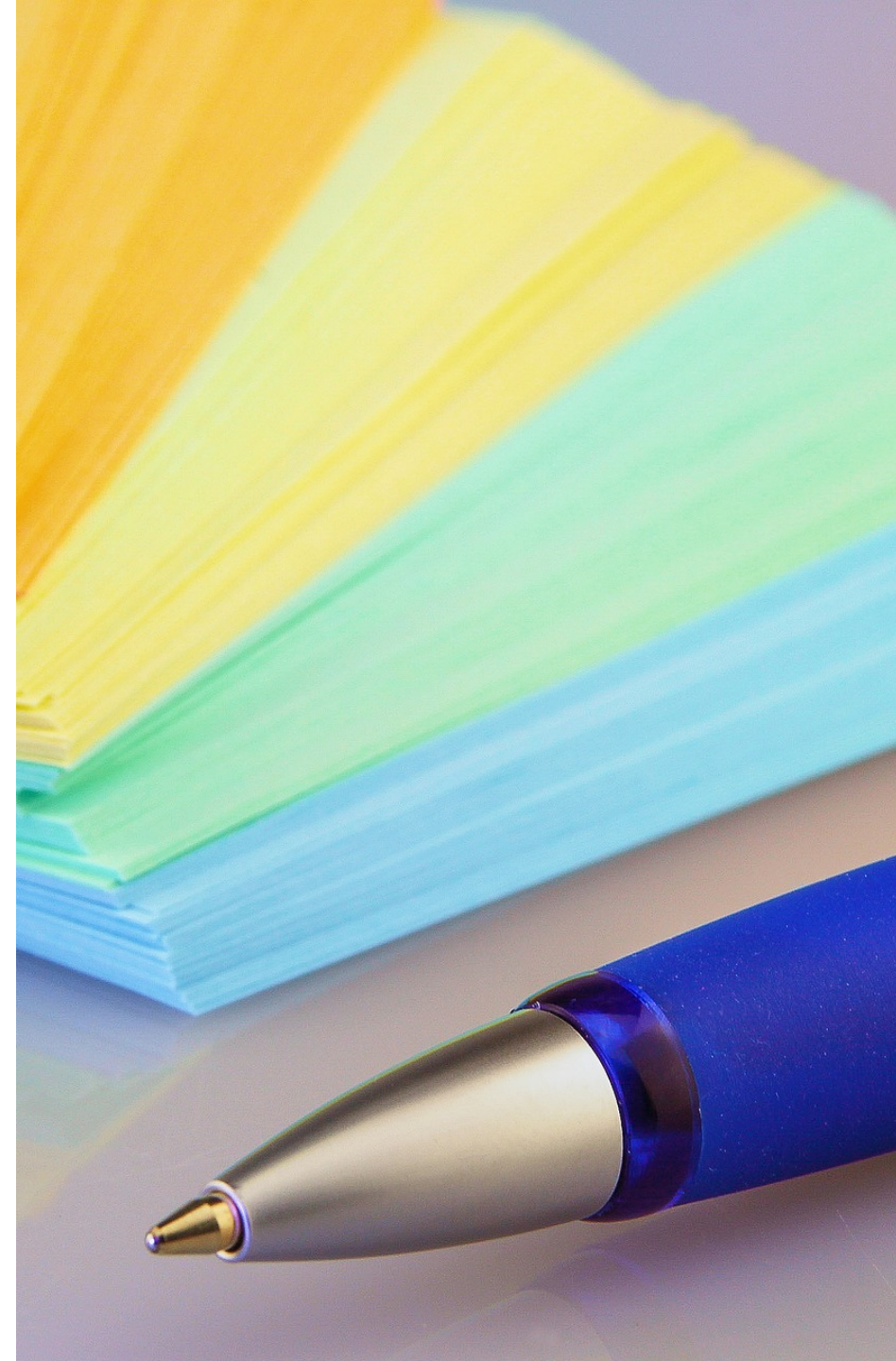
What does a successful collaboration need?

Do you like to get challenged? In what ways?

What do you do when your got stuck?

How do you react when you find a mistake in your work or your colleagues work?

What are your perfect working conditions?



SOME REASONS WHY WE SHOULD CARE....

Discriminatory comments,
drawings, posters effect
all people who see them.

(Chrobot-Mason, et al. 2013)

Organisations which invest
in creating an inclusive
environment benefit from it.

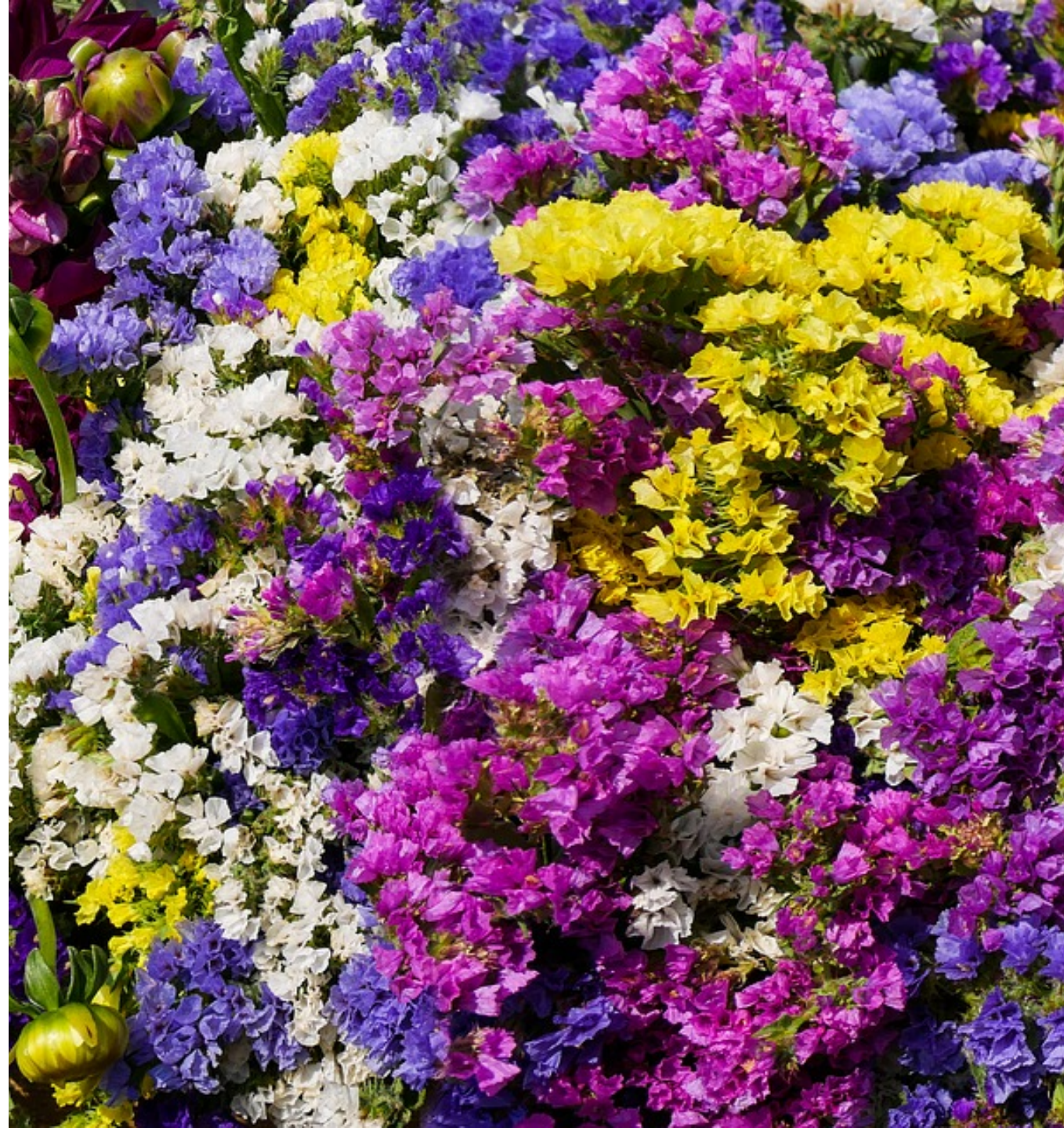
(Ragins et al. 2012)

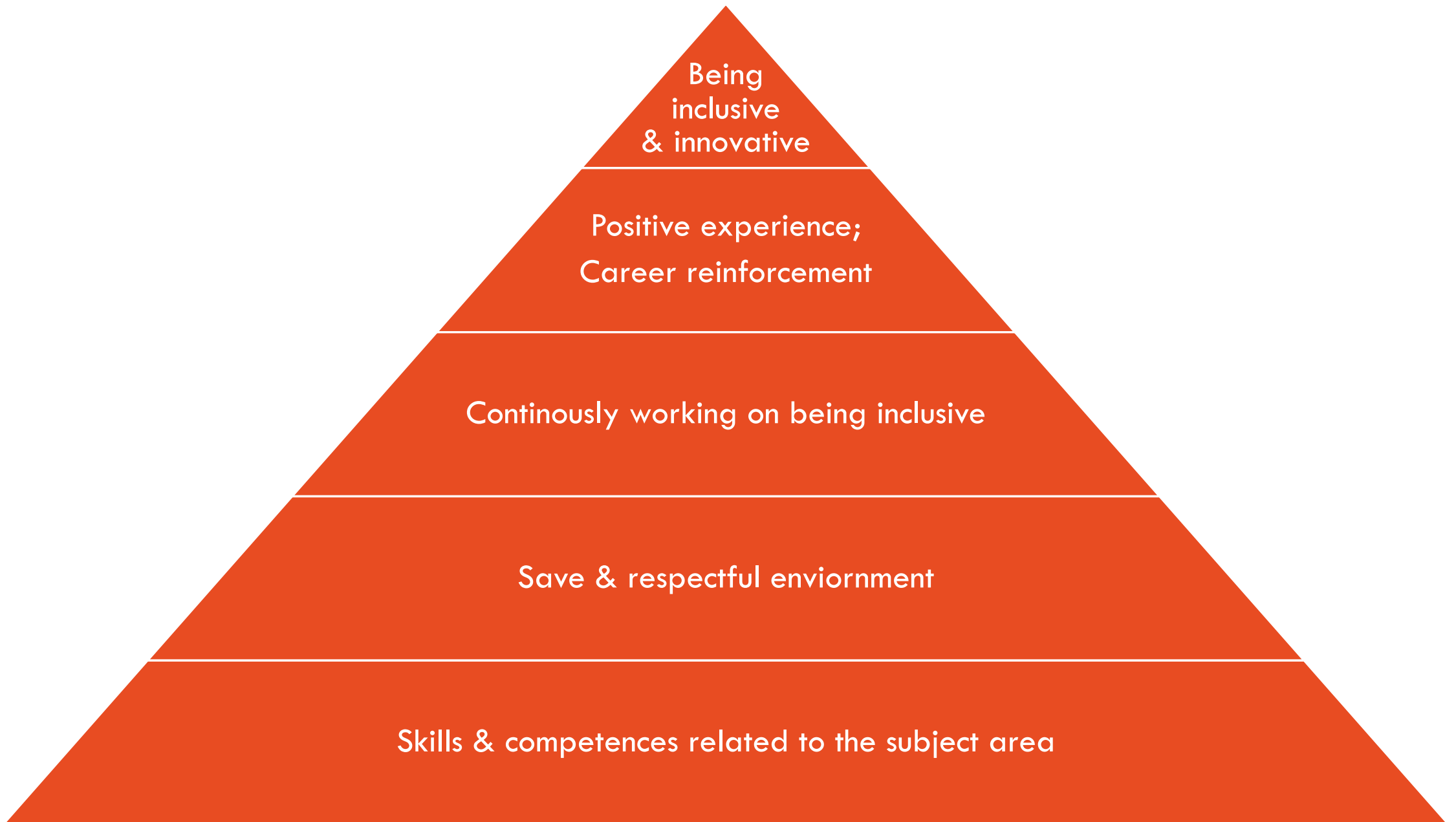


INCLUSION

Inclusion means basically that members have chance to maintain their uniqueness while at the same time be treated as an insider and belongs to the group.

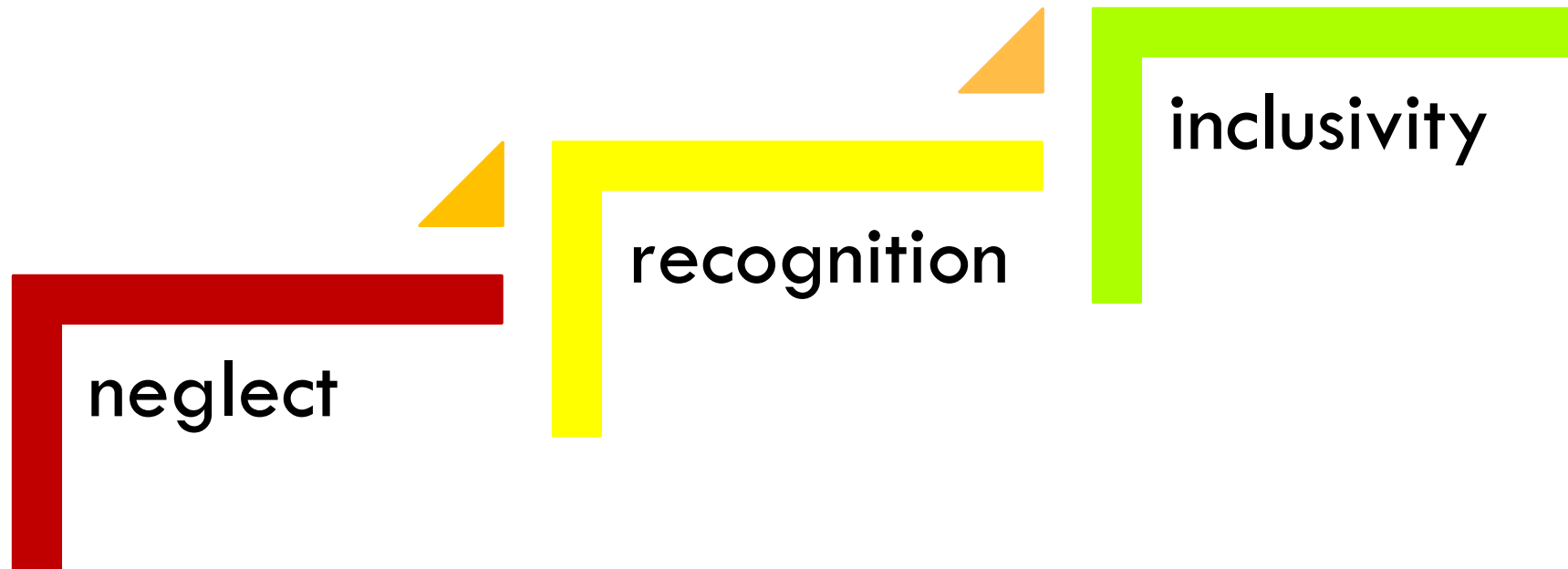
(Shore 2011)





(Peters 2018)

STEPS TOWARDS MORE INCLUSIVITY



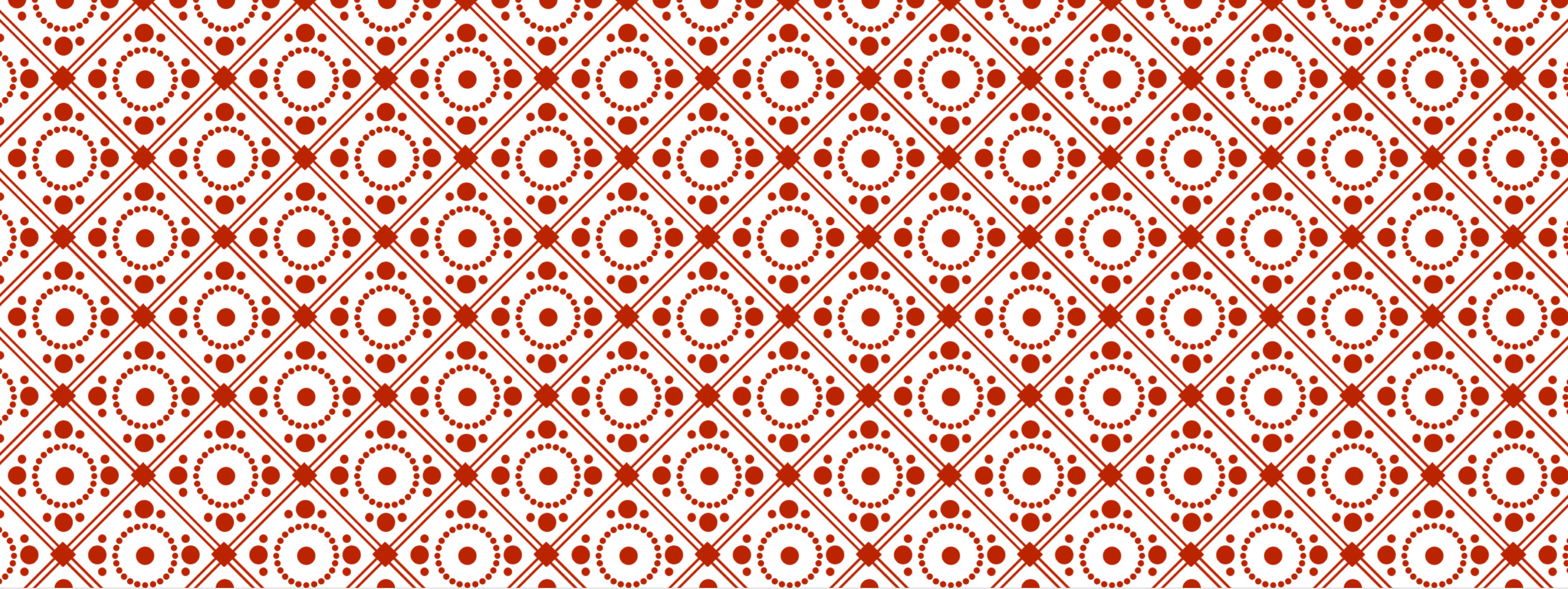
IT IS UP TO ALL
OF US



YOUR PERSONAL GOAL....

Please write down on a piece of paper the answer to the following questions

- How do I recognise if someone feels of unease due to discriminatory comments or behaviour?
- Whenever I believe some feels of unease due to discriminatory comments/behaviour, I will do the following...



THANK YOU FOR YOUR ATTENTION

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REFERENCES

- Acker, Joan. 1992. „From sex roles to gendered institutions“. *Contemporary Sociology* 21 (5): 565–69. <https://doi.org/10.2307/2075528>.
- Caliskan, Aylin, Joanna J. Bryson, und Arvind Narayanan. 2017. „Semantics derived automatically from language corpora contain human-like biases“. *Science* 356 (6334): 183–86. <https://doi.org/10.1126/science.aal4230>.
- Chrobot-Mason, Donna, Belle Rose Ragins, und Frank Linnehan. 2013. „Second hand smoke: Ambient racial harassment at work“. *Journal of Managerial Psychology* 28 (5): 470–91. <https://doi.org/10.1108/JMP-02-2012-0064>.
- Humbert, Anne Laure, und Elisabeth Anna Guenther. 2018. „Measuring gender diversity in research teams: methodological foundations of the Gender Diversity Index“. <https://doi.org/10.5281/zenodo.1442706>.
- Kitchin, Rob. 2017. „Thinking critically about and researching algorithms“. *Information Communication and Society* 20 (1): 14–29. <https://doi.org/10.1080/1369118X.2016.1154087>.
- Peters, Jan. 2018. „Designing inclusion into engineering education“. <https://www.raeng.org.uk/publications/reports/designing-inclusion-into-engineering-education>.
- Ragins, Belle Rose, Jorge A. Gonzalez, Kyle Ehrhardt, und Romila Singh. 2012. „Crossing the Threshold: The Spillover of Community Racial Diversity and Diversity Climate to the Workplace“. *Personnel Psychology* 65 (4): 755–87. <https://doi.org/10.1111/peps.12001>.
- Schiebinger, Londa, Ineke Klinge, Ines Sánchez de Madariaga, Hee Young Paik, Martina Schraudner, und Marcia Stefanick. 2019. „Gendered Innovations in Science, Health & Medicine, Engineering and Environment.“ genderedinnovations.stanford.edu. 2019. <http://genderedinnovations.stanford.edu>.
- Shore, Lynn M., Amy E. Randel, Beth G. Chung, Michelle A. Dean, Karen Holcombe Ehrhart, und Gangaram Singh. 2011. „Inclusion and diversity in work groups: A review and model for future research“. *Journal of Management*. <https://doi.org/10.1177/0149206310385943>.
- Zou, James, und Londa Schiebinger. 2018. „Design AI so that its fair“. *Nature* 559 (7714): 324–26. <https://doi.org/10.1038/d41586-018-05707-8>.