Lighthouse for Computer Science

LH4CS.org

national center for women & INFORMATION TECHNOLOGY

Resources

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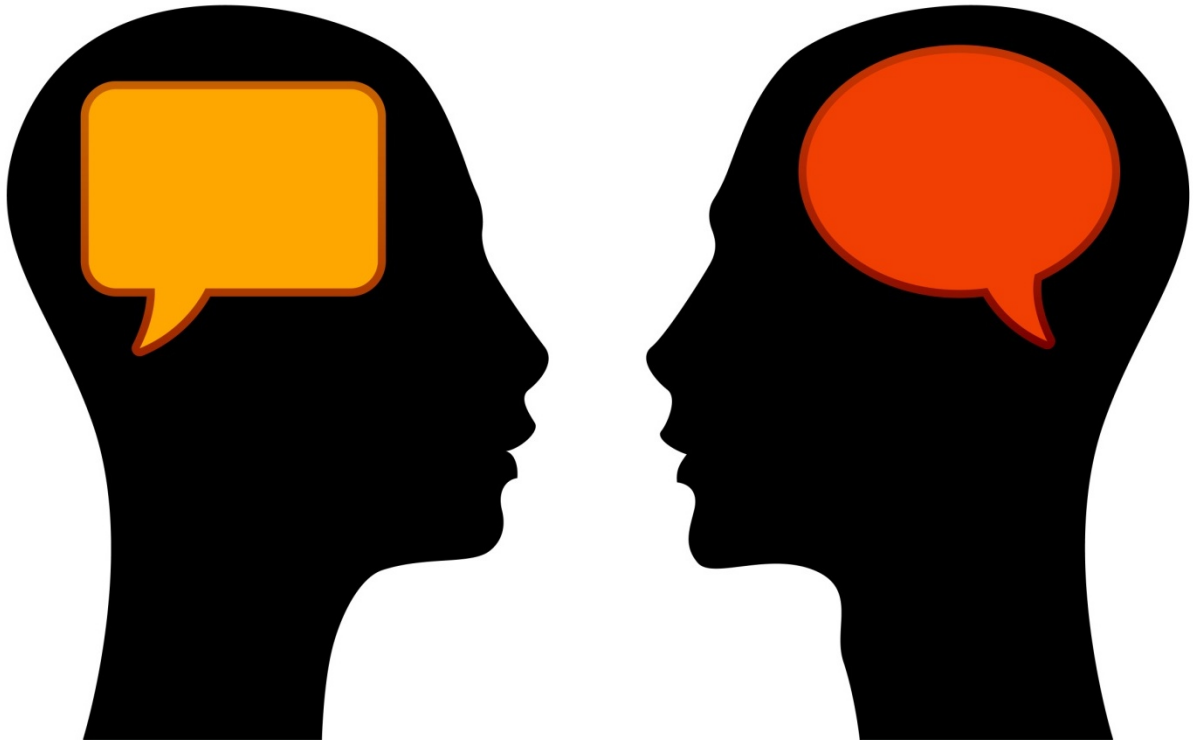
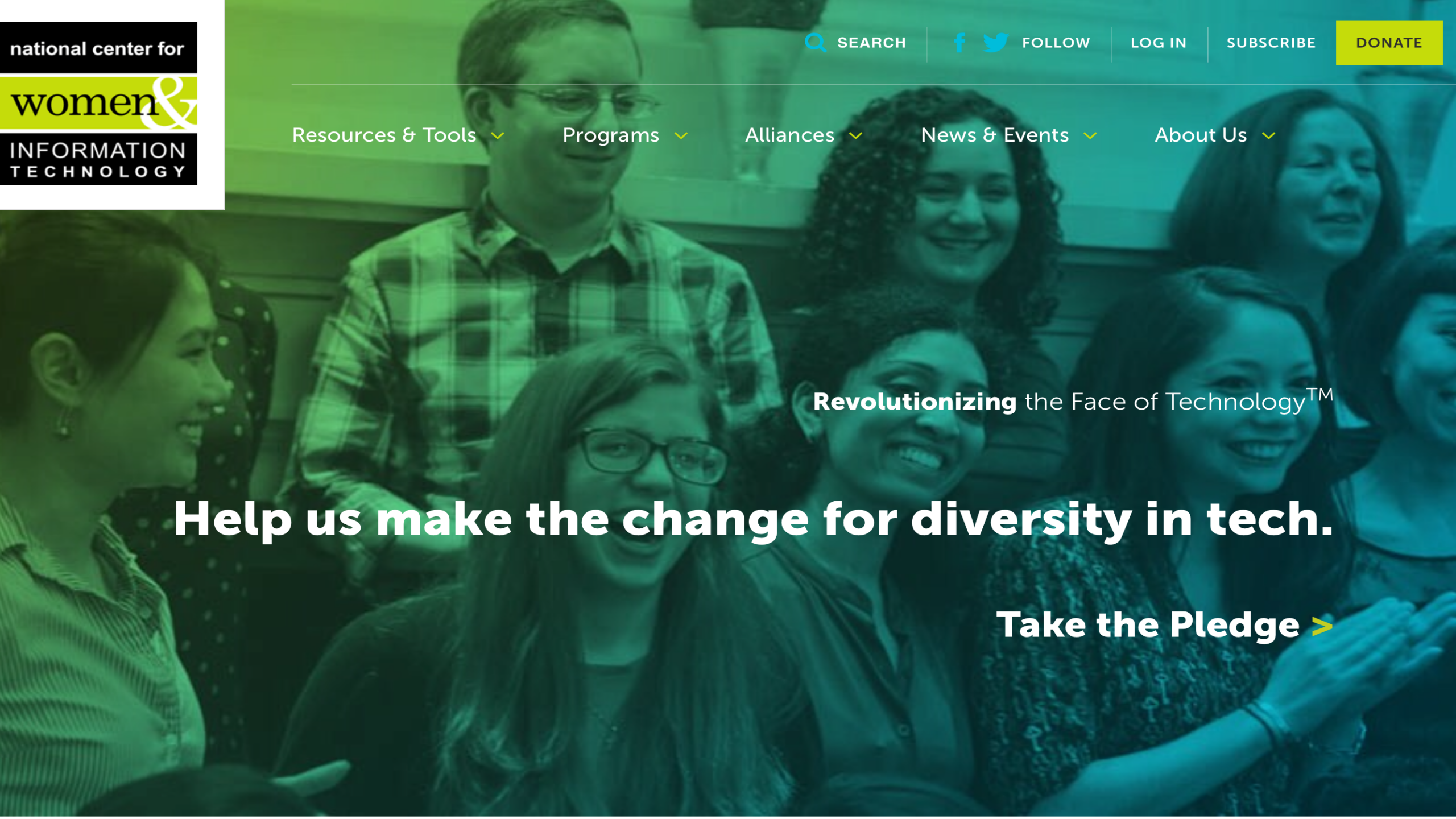


ncwit.org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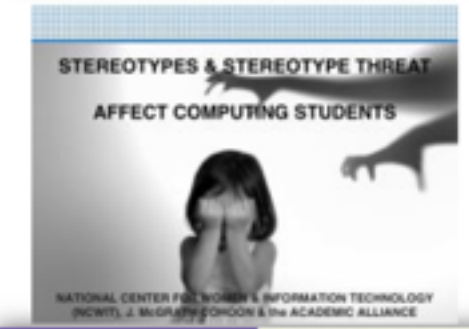
NCWIT provides free, high-quality, research-based resources



NCWIT resources can help you:

- Inform others about the importance of CS
- Inform others about the need for diversity in CS
- Recruit and retain diverse students in your CS classes
- Find engaging and inclusive class materials

www.ncwit.org

You, (or your child or student) should consider pursuing a degree in computing because:

Computing pays well

(U.S. Bureau of Labor Statistics, 2014)

Top 10 Ways

- Families can Encourage Girls' Interest in Computing (also in Spanish)
- To Increase Girls' Participation in Computing Competitions
- Of Recruiting High School Women into Your Computing Classes

To Engage Under-Represented Students in Computing

In-A-Box – everything you need to know to get started with:

- Pair Programming
- E-Textiles
- CS Unplugged
- Agent Cubes – Introducing Computing through Game Design

Promising Practices and Case Studies

Sample topics:

- Evaluating Software for Gender Bias
- Inclusive Strategies for Teaching Students with Disabilities
- Design Physical Space with Broad Appeal
- Change the Gender Composition of High School CS courses
- Encouragement Works
- Pair Programming
- Stereotype threat
- Scratch
- Alice
- CS Unplugged

National Center for Women & Information Technology

PROMISING PRACTICES

Better Approaches to Well-Intentioned, but Harmful Messages (Case Study 1):

Overcoming Stereotype Threat to Improve Retention

K-12 Education | Undergraduate | Graduate

EXPERIMENTS WITH STEREOTYPE THREAT DEMONSTRATE BEST PRACTICES

Students often approach education as a search for their inherent talents, rather than development of new abilities, because they believe that intelligence is unchanging. This belief leads students to shy challenging subjects when faced with initial difficulties or stereotype threats. A successful intervention designed to short circuit this process was studied by Good et al. (2003). The intervention had four steps:

1. College students mentored seventh-graders and taught them that intelligence can be increased.
2. Mentors attributed any learning difficulties to the situation instead of students' shortcomings.
3. Mentors gave the seventh-graders access to information about how the brain forms new connections over time.
4. The middle-school students communicated what they had learned about the expandable nature of intelligence to others.

Results of this experimental intervention included improved test performance and no gender gap in test performance. Other interventions produced similar results when students were encouraged to believe that intelligence increases through practice and effort. And some experiments showed that in certain situations, it was enough simply to tell students that the test they were about to take had never shown gender differences in outcomes.

TRUE STEREOTYPE THREATS FROM COMPUTING EDUCATION — AND RECOMMENDATIONS FOR AVOIDING THEM

Calling attention to women's underrepresentation in computing can cause stereotype threat, even when it is well-intended. These true stories illustrate problems and suggest solutions.

TRUE STORY

During orientation for new computer science undergraduate majors, a woman who was comfortable in computing because her mother is a computer scientist recently noticed the typical gender composition of her cohort. She was the only woman in her group of fifty new students, an unfortunate, but familiar situation. Then the woman was approached by a professor counselor who intended to encourage her by pushing "You are so brave to major in computer science! I really admire you." The new student had not been worried until that moment.

POSSIBLE SOLUTION

Build Community:

This counselor might simply have introduced herself to students, and students to each other, perhaps revealing women versus my asking them why they chose this major. Initiating conversations in this way could begin forming community and put everyone at ease.

TRUE STORY

An instructor sent students an end-of-course email saying, "Women earned three of the top four course averages in the class. The course average for you seven women was 2.6 points higher than for the thirteen men. You're showing that women can do just fine in CS good work!" (What did he expect?)

POSSIBLE SOLUTION

Avoids Invoking Negative Stereotypes:

The instructor might have sent an email congratulating the top students on their performance. The message could also have included a grade distribution, so students could compare themselves with classmates. This information would allow the women to see how well they had done without making their achievement seem unusual.

RESOURCES

ncwit.org

Latinas & Tecnología de la Información

Resources
Profiles of Latinas in Tech
Videos
Links

PERFILES

Yolián Amaro-Rivera
Estudios de licenciatura, Ingeniería en computación

www.ncwit.org/latinas-information-technology

An online collection of CS1/CS2 course materials to help retain and recruit diverse students

Google

www.engage-csedu.org

What's special about EngageCSEdu?

- 1500+ peer-reviewed course materials… and growing
- Easy to browse and search
- All materials employ research-based Engagement Practices
- Linked to NCWIT resources and research

Course Materials include:

Projects
Homework Assignments
Tutorials
Labs
Assessments
Lecture Notes
Exercises

Search for materials by:

Course Level
- CS1, CS2

Material Type
- Assessment, assignment, lecture slides, lab, etc…

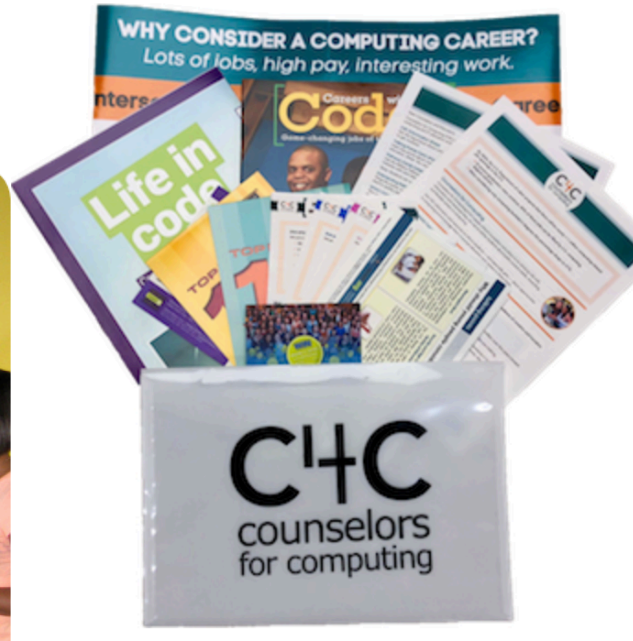
Programming Language
- C, C#, C++, Java, JavaScript, Python, etc…

Engagement Practices
- Meaningful and relevant context,
- Address misconceptions about CS,
- Effective encouragement, etc…

Counselors for Computing (C4C)

- NCWIT program providing PD for Counselors
- provides information & resources they can use to support ALL students as they explore computer science education and careers
- order kits for your school counselors

ncwit.org/c4c



Counselors for Computing Is:

C4C counselors for computing

www.ncwit.org/c4c

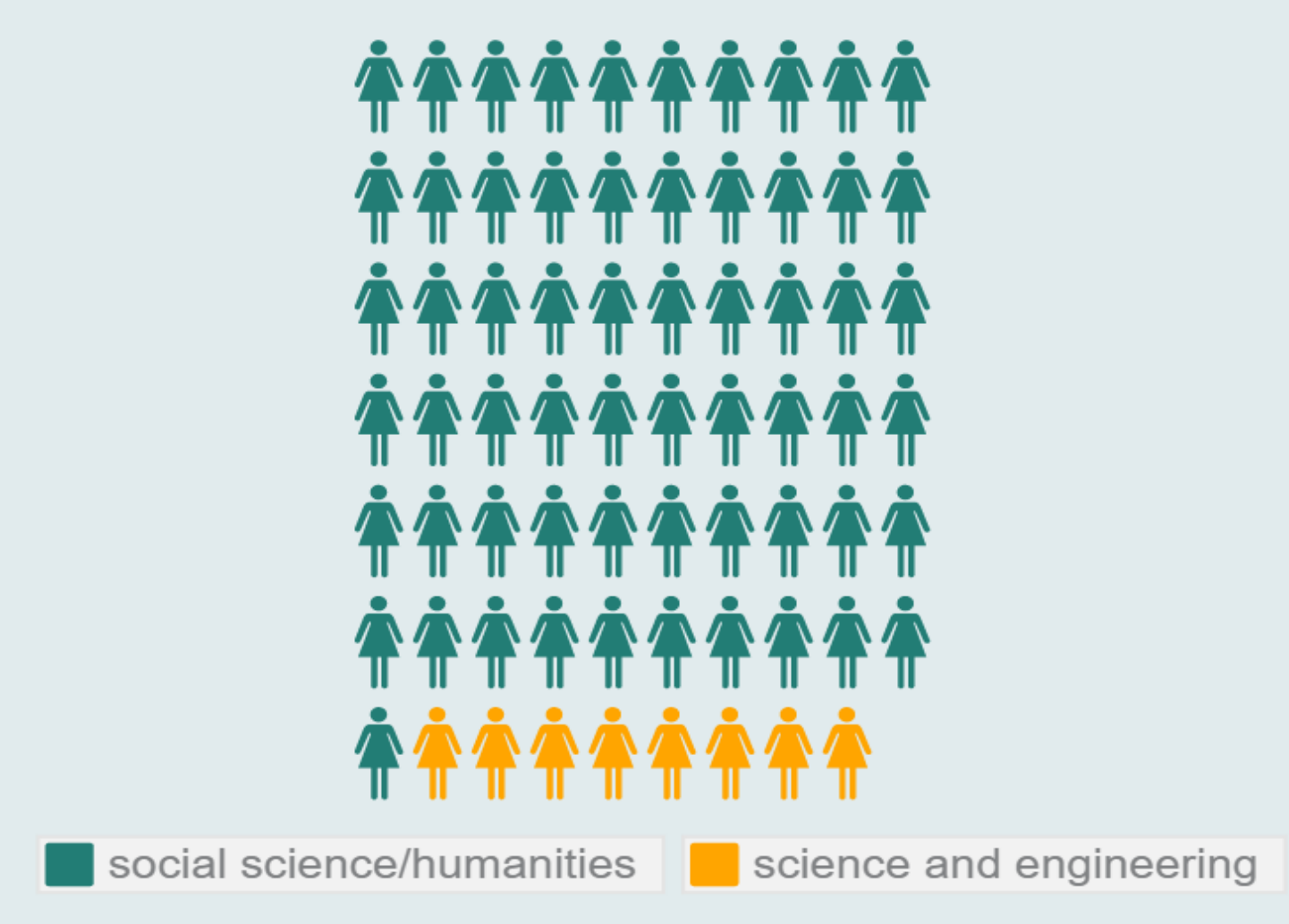
1. **Staff Development** for professional school counselors

   Programs from full-day workshops to 1-hour webinars to conference sessions

   Presented with partners from industry, universities, school districts, CS and counselor communities

2. **Resources**

Counselor undergrad degrees earned



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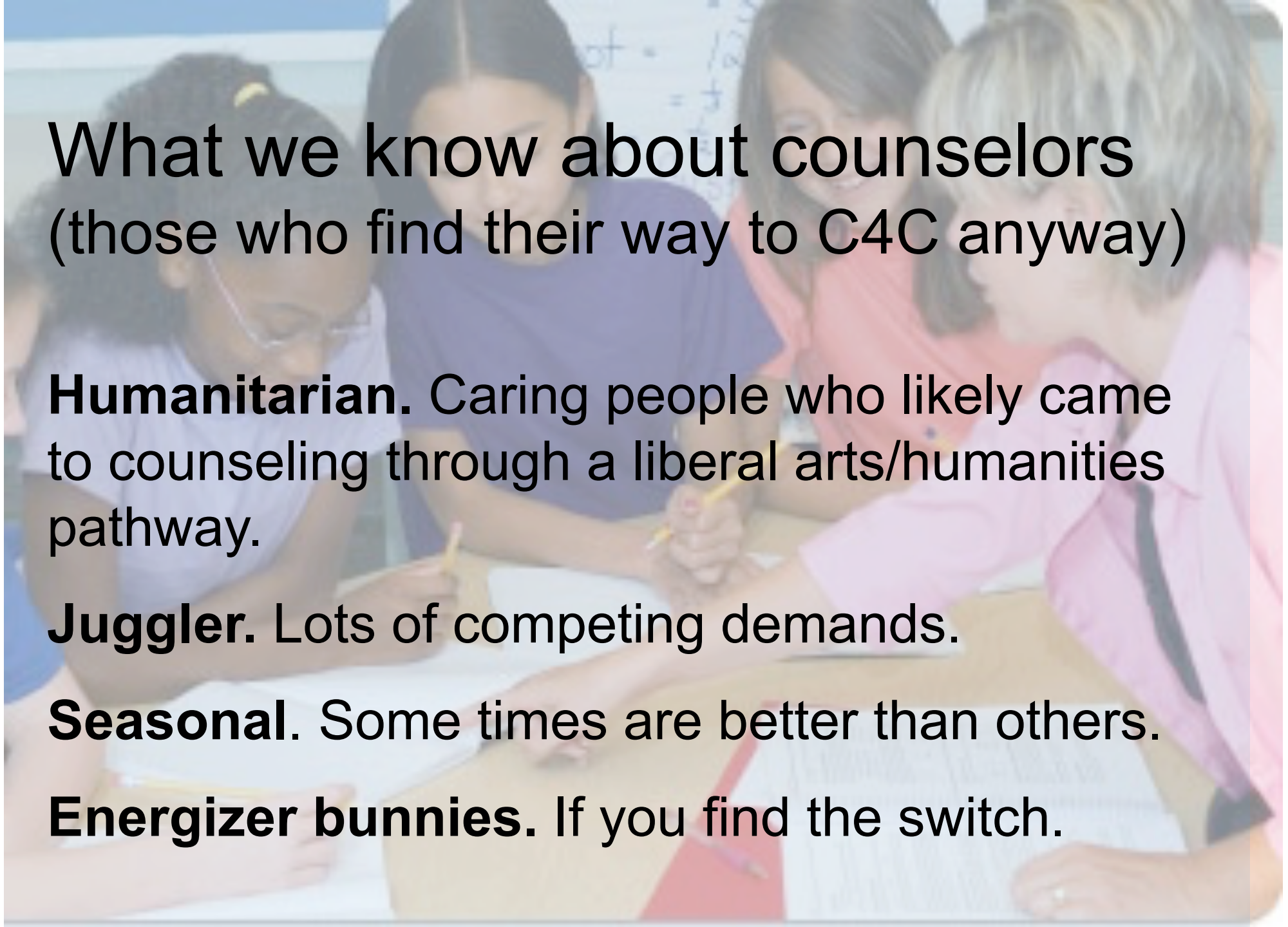
Counselor background likely affects readiness to guide toward STEM, Computer Science



What we know about counselors
(those who find their way to C4C anyway)

Humanitarian. Caring people who likely came to counseling through a liberal arts/humanities pathway.

Juggler. Lots of competing demands.

Seasonal. Some times are better than others.

Energizer bunnies. If you find the switch.

Counselors for Computing can...

Partner for staff development to support high school CS programs

- new courses
- existing
- K-8 pipeline

Provide materials to support CS program development

- C4C-in-a-Box
- C4C Kits
- And...?

Connect you with

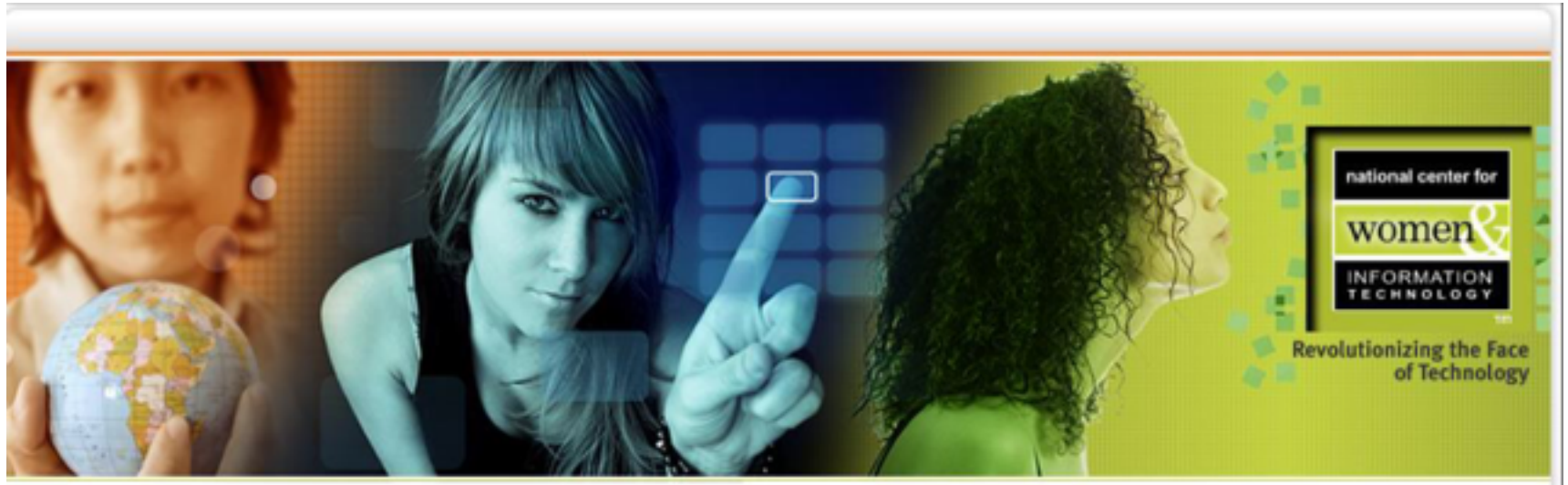
- Counselor communities
- NCWIT network

Advise about

- Counselor experience
- College preparation

Contact: c4c@ncwit.org

Aspirations in Computing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Thank you!