

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM

A Thought-Provoking and Interactive Photo-Research Exhibit

By

Eden Hennessey, D.S.W., M.A., PhD Candidate, Psychology



Is honesty the best policy?

For women in STEM (science, technology, engineering & math) this may not be true. A follow-up to the successful #DistractinglySexist exhibit, this extended collection presents challenges faced by women in STEM from different perspectives.

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM

#DistractinglyHonest is a photo-research collaboration between Eden Hennessey and photographer Hilary Gauld that features real women in science and their allies from Wilfrid Laurier University, York University, Ryerson University, and the Lassonde School of Engineering.

The project was possible with supportive friends, family, research assistants, advisors, Hilary Gauld, Sarah Mueller, The Laurier Centre for Women in Science, Communitech, The Laurier Graduate Students' Association, and Laurier Alumni Services.



Researcher Biography

Eden Hennessey



Eden Hennessey is completing a PhD in Social Psychology with Dr. Mindi Foster where she focuses on how women respond to sexism in STEM (i.e., science, technology, engineering and math). Gender disparities in STEM continue; Eden's recent research shows that female WLU STEM students experience stereotyping; some report they are called 'weirdos' and even 'witches.'

One way to reduce sexism is to confront it; however, confrontation may have serious costs (e.g., social/professional consequences). Eden's dissertation assesses whether female confronters of sexism in STEM perceive and incur greater consequences than other women. Further, her research explores how virtual mentors and a strong scientific identity impact the consequences of confronting sexism in STEM. Eden's passion for research extends to her position as Student Research Coordinator of the Laurier Centre for Women in Science (WinS).

Eden's work has local and global relevance; a recent report named Waterloo Canada's worst city for women, linking gender disparities in STEM to stress, underemployment and one of the countries' largest gender-wage gaps. Given Waterloo's designation as 'Canada's Silicon Valley' it is essential we attract and retain female STEM talent. I hope these images inspire thought about gender disparities in science, but also impart a sense of optimism about the future of women in STEM.

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



1. #HonestlyAdvocating, 2016

24" x 36" Digital Print

Tara Kleinsteuber, STEM Mentoring/GLOW Coordinator

Nora Richter, TechGyrls YWCA Cambridge Girls' Centre

Programs are #HonestlyAdvocating to increase gender diversity in science. Some research shows that gender-specific programs improve girls' attitudes toward STEM subjects. One study showed that after participating for one year in an all-female after school science program, fourth grade girls showed increased interest in science and greater scientific knowledge compared to control participants (Tyler-Wood, Ellison, Lim, & Periathiruvadi, 2012). Initiatives to encourage women in science have existed for decades, yet actual increases in gender diversity are slow (NSF, 2008).

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



#HonestlyInfluential

2. #HonestlyInfluential, 2016

24" x 36" Digital Print

Ella Caissie, Daughter of PhD Candidate Kelly McDonald-Caissie
(Social Psychology) Wilfrid Laurier University

Honestly speaking, while targeted initiatives can attract more women to STEM, gender norms and early childhood socialization experiences are #HonestlyInfluential. Research shows children learn gender stereotypes in the first three years of life (Weinraub et al., 1984). Science stereotypes strongly impact children. For instance, in a study of over 4,000 children aged five to ten years, only 28 girls (<1%) drew women scientists (Chambers, 1983).

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



#HonestlyEqual

3. #HonestlyEqual, 2016

24" x 36" Digital Print

Dawn Bazely, Professor (Biology), York University

Jen M. Zomederis, Researcher, York University Observatory

Faculty of Physics and Astronomy

Advances in gender equity have occurred in the last few decades, leading some people to believe that numbers of men and women in science are #HonestlyEqual. Perceptions of the existing status quo as 'equal' will not likely impact change. Indeed, collective action (i.e., whereby a person acts to advance their social groups' status) literature suggests that to enact change, one first must be able to recognize that one's social group is deprived relative to another group (see Relative Deprivation Theory; Runciman, 1966; Van Zomeren, Postmes, & Spears, 2008).

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



#HonestlyChallenging

4. #HonestlyChallenging, 2016

24" x 36" Digital Print

Amanda Desnoyers, PhD Candidate (Social Psychology)

Wilfrid Laurier University and son Oliver

Honestly speaking, men's and women's experiences can differ drastically - women (versus men) in STEM report more sexual harassment, isolation, stereotyping, and a battle to maintain work/life balance, which are #HonestlyChallenging. For example, one study of American women in technology found that one third of participants reported delaying career goals to have a family, and were more likely than male colleagues to report forgoing marriage and/or children to achieve career goals (Simard et al., 2008).

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



5. #HonestlyImagining, 2016

24" x 36" Digital Print

Imogen Coe, Dean of Science
Ryerson University

If we do not recognize gender bias where it exists, we risk #HonestlyImagining the situation through rose coloured glasses. We cannot change what we will not see; the fact remains that gender biases in STEM persist. In a recent study young scholars (i.e., male and female graduate students) rated identical abstracts ostensibly authored by either men or women (Knobloch-Westerwick, Glynn, & Huge, 2013). All participants rated the male-authored (versus female authored) abstracts as having higher scientific quality and they expressed greater interest in collaboration.

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM

Complainer

Troublemaker

Risky

Bitchy

Emotional

Irrational

Competent

Stresssey

Brave

Admirable

Funny

#HonestlyComplicated



6. #HonestlyComplicated, 2016

24" x 36" Digital Print

Helen Ramirez, Lecturer (Women and Gender Studies)

Wilfrid Laurier University

Honestly speaking, gender biases persist and when women confront sexism, they are viewed positively and negatively so the situation becomes #HonestlyComplicated. In non-STEM contexts, women incur social costs when they confront sexism; confronters are viewed negatively, fear retaliation, and are labeled 'complainers' (Czopp & Monteith, 2003; Saunders & Senn, 2009). My dissertation research (Hennesssey & Foster, 2016; forthcoming) shows that confronters are met with negative consequences, but also positive perceptions like strength and bravery, making the decision to speak out a difficult one.

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



#HonestlyObjecting

7. #HonestlyObjecting, 2016

24" x 36" Digital Print

Stephanie Rozek, Executive Director, Hive Waterloo Region

In my research, I argue that the social costs of speaking out against sexism in STEM may prevent women from #HonestlyObjecting. Not surprisingly, many women do not confront sexism because of the social costs, even when they think the costs will not influence them (Nicole, & Stewart, 2004). In my dissertation, women ($N = 213$; 56% STEM majors) imagined themselves confronting or ignoring sexism in a science or arts classroom, and indicated social and personal costs. STEM majors imagining confrontation in arts reported lower negative affect and higher competence than those imagining confrontation in science. Among STEM women, non-STEM contexts (vs. STEM contexts) may be more conducive to confrontation (Hennesssey & Foster, 2016; forthcoming).

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



#HonestlyEmpowered

8. #HonestlyEmpowered, 2016

24" x 36" Digital Print

Marisa Sterling, PEng, Assistant Dean, Inclusivity and Diversity
Lassonde School of Engineering

Honestly speaking, it is essential for women in STEM to be #HonestlyEmpowered to take action against sexism, because confrontation works to decrease future bias, thereby improving the climate. One study showed that when male participants were confronted by a female confederate about a sexist remark, they engaged in more positive conversations with women afterwards and they were more likely to detect sexist language in future instances (Mallet, 2011). Active (versus passive) coping responses are associated with increased psychological well-being (Kaiser & Miller, 2001; Foster, 2009), so it is beneficial to take action.

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



9. #HonestlyAccomplished, 2016
24" x 36" Digital Print
Leanne Holland Brown, Dean of Students
Wilfrid Laurier University

To encourage more people to enter STEM we must celebrate advances in gender equity when they do occur – to recognize what has been #HonestlyAccomplished. It is crucial we recognize the tremendous progress that women have made in business and education. According to Statistics Canada (Hango, 2013), young Canadians are increasingly likely to obtain a university degree, regardless of gender. In fact, 59% of all university graduates aged 25 to 34 in 2011 were female. However, in STEM fields progress is less remarkable - the ratio of men to women plateaus at around 70:30 (Hango, 2013). Gains in gender diversity are clear in some disciplines, whereas STEM remains far from the finish line.

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



10. #HonestlyInclusive, 2016

24" x 36" Digital Print

Julie Mueller, Associate Professor (Faculty of Education)

Teach Digital Lab

Wilfrid Laurier University

Honestly speaking, it is imperative to create #HonestlyInclusive spaces in STEM so all voices are represented in scientific conversations. In addition to a lack of gender diversity in STEM, other minorities are similarly underrepresented in science – a recent survey of the American STEM workforce showed employees were 71% white (Landivar, 2013). Less diversity may stunt scientific progress, given the benefits of diverse groups (e.g., greater problem solving than more homogeneous groups; Gurin, Dey, Hurtado & Gurin, 2002; employee creativity, efficiency, and quality; Earley & Mosakowski, 2000; Ely & Thomas, 2001).

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



11. #HonestlyIngenious, 2016

24" x 36" Digital Print

Shohini Ghose, Professor (Physics and Computer Science)

Wilfrid Laurier University

It is time for women in STEM to be recognized in fields where #HonestlyIngenious women have been historically invisible. For much of history women were absent from the scientific landscape. When they were present, they achieved great feats, but were often not given credit for doing so. For instance, Rosalind Franklin's data were critical to Crick and Watson's Nobel Prize for discovering DNA, yet she was not acknowledged by the academy (Barnett & Sabattini, 2009). Visibility matters – increased representation of women in STEM will influence future generations. For instance, female students look to faculty as role models (Ferreira, 2003).

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



12. #HonestlyUnaffected, 2016

24" x 36" Digital Print

Alyssa Armstrong, Future Science Superhero, Grade 2 Student

Honestly speaking, parents, educators, researchers, and employers must promote gender diversity in STEM so that young scientists of tomorrow are #HonestlyUnaffected by negative biases. It is possible to inoculate women against stereotype threat; the stereotype inoculation model (SIM) posits that contact with female STEM mentors enhances women's STEM self-concept by challenging negative stereotypes of women in STEM (Stout et al., 2011). Supporting female-to-female mentoring may increase the likelihood that women will confront sexism in STEM if they do experience it: Settles, Cortina, Stewart, & Malley (2007) showed that women mentored by women perceived having greater sense of personal agency.

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



#HonestlyInterdisciplinary

13. #HonestlyInterdisciplinary, 2016

24" x 36" Digital Print

Vanessa Vakharia, The Math Guru

Perhaps by encouraging people to be #HonestlyInterdisciplinary we can increase diversity and excellence within the scientific community. Productive and unique collaborations can come from combining arts and sciences. For instance, chemists and photographers have collaborated to produce acclaimed images of water drops on a hydrophilic surface, which appeared in the prestigious journal *Science* (Felton & Petkewich, 2003). It could be that people perceive arts as inconsistent with science. According to the Role Incongruity Model of prejudice, when people enact stereotype-incongruent social roles they face hostile prejudice (Eagly & Karau, 2002).

#DISTRACTINGLYHONEST: CONFRONTING SEXISM IN STEM



14. #HonestlyInterdisciplinary, 2016

24" x 36" Digital Print

Cat Coode, Binary Tattoo

Perhaps by encouraging people to be #HonestlyInterdisciplinary we can increase diversity and excellence within the scientific community. If scientists appear in unexpected roles (i.e., arts), this may elicit hostility. Further, science is stereotypically masculine, whereas liberal arts are stereotypically feminine (Nosek et al., 2009), therefore women in science may not wish to show artistic interest, as this could activate a stigmatized gender identity. Across two experimental studies, researchers demonstrated that feminine cues could signal that women were not suited to a career in science (Banchefsky, Westfall, Park, & Judd, 2016). Perhaps if we changed the stereotypical view of 'what a scientist looks like' to incorporate more women and the arts, this may increase the diversity and strength of the scientific workforce.



15. #EssentialElements

Periodic Table - pe·ri·od·ic ta·ble

A table of the chemical elements A periodic table was the inspiration for this collage piece. Like a periodic table, women in science are a diverse group of elements each with their own unique properties. Using real chemical elements, the artist embedded a secret message in this piece. Can you decipher it?

From Top Row Left to Right:

Marisa Sterling, Jenn Zomederis, Cat Coode, Imogen Coe, Dawn Bazely, Charlotte Armstrong, Amanda Desnoyers, Leanne Holland-Brown, Julie Mueller, Stephanie Rozek, Alyssa Armstrong, Tara Kleinsteuber, Nora Richter, Shohini Ghose, Vanessa Vakharia, and Helen Ramirez

WILFRID LAURIER UNIVERSITY



Contact Eden at:

Email: ejvhennessey@gmail.com;
henn8280@mylaurier.ca
Twitter: [@EdenHennessey](https://twitter.com/EdenHennessey)



Express your feedback here! Scan this barcode & complete a brief survey:



References

1. #HonestlyAdvocating

National Science Foundation (NSF) Division of Science Resources Statistics (2008). Science and engineering degrees: 1966–2006. (Detailed Statistical Tables, NSF 08- 321; Arlington, VA), Table 25, *Author's analysis of Tables 34, 35, 38, & 39*.

Tyler-Wood, T., Ellison, A., Lim, O., & Periathiruvadi, S. (2012). Bringing up girls in science (BUGS): The effectiveness of an after-school environmental science program for increasing female students' interest in science careers. *Journal of Science Education and Technology*, 21(1), 46- 55.

2. #HonestlyInfluential

Chambers, D. W. (1983). Stereotypic images of the scientist: The Draw-a-Scientist Test. *Science Education*, 67(2), 255-265.

Weinraub, M., Clemens, L. P., Sockloff, A., Ethridge, T., Gracely, E., & Myers, B. (1984). The development of sex role stereotypes in the third year: relationships to gender labeling, gender identity, sex-typed toy preference, and family characteristics. *Child Development*, 55(4), 1493, doi:10.1111/1467-8624.ep7303030.

3. #HonestlyEqual

Runciman, W. G. (1966). Relative deprivation and social justice: A study of attitudes to social inequality in twentieth-century England. Berkeley: University of California Press.

Van Zomeren, M., Postmes, T., & Spears, R. (2008). Toward an integrative social identity model of collective action: a quantitative research synthesis of three socio-psychological perspectives. *Psychological Bulletin*, 134(4), 504.

4. #HonestlyChallenging

Simard, C., Henderson, A. D., Gilmartin, S. K., Schiebinger, L., & Whitney, T. (2008). Climbing the technical ladder: Obstacles and solutions for mid-level women in technology. *Institute for Women and Technology*.

5. #HonestlyImagining

Knobloch-Westerwick, S., Glynn, C., & Huge, M. (2013). The Matilda effect in science communication: An experiment on gender bias in publication quality perceptions and collaboration interest. *Science Communication*, 35(5), 603-625. doi:10.1177/1075547012472684

6. #HonestlyComplicated

Czopp, A. M., Monteith, M. J., & Mark, A. Y. (2006). Standing up for a change: reducing bias through interpersonal confrontation. *Journal of Personality and Social Psychology*, 90(5), 784.

Hennessey, E., & Foster, M.D. (2016). Confronting sexism in science, technology, engineering, and math (STEM): Establishing perceived and directed social costs. *Manuscript forthcoming*.

Saunders, K. A., & Senn, C. Y. (2009). Should I confront him? Men's reactions to hypothetical confrontations of peer sexual harassment. *Sex Roles*, 61(5-6), 399-415.

7. #HonestlyObjecting

Hennessey, E., & Foster, M.D. (2016). Confronting sexism in science, technology, engineering, and math (STEM): Establishing perceived and directed social costs. *Manuscript forthcoming*.

Nicole, S. J., & Stewart, R. E. (2004). Confronting perpetrators of prejudice: The inhibitory effects of social costs. *Psychology of Women Quarterly*, 28(3), 215-223.

8. #HonestlyEmpowered

Foster, M. (2009). The dynamic nature of coping with gender discrimination: Appraisals, strategies and well-being over time. *Sex Roles*, 60(9-10), 694-707.

Mallett, R. K., & Wagner, D. E. (2011). The unexpectedly positive consequences of confronting sexism. *Journal of Experimental Social Psychology*, 47(1), 215-220.

Miller, C. T., & Kaiser, C. R. (2001). A theoretical perspective on coping with stigma. *Journal of Social Issues*, 57(1), 73-92.

9. #HonestlyAccomplished

Hango, D. (2013). Gender differences in science, technology, engineering, mathematics and computer science (STEM) programs at university. Insights on Canadian Society. Statistics Canada Catalogue no. 75-006-X.

10. #HonestlyInclusive

Earley, C. P., & Mosakowski, E. (2000). Creating hybrid team cultures: An empirical test of transnational team functioning. *Academy of Management Journal*, 43(1), 26-49.

Ely, R. J., & Thomas, D. A. (2001). Cultural diversity at work: The effects of diversity perspectives on work group processes and outcomes. *Administrative Science Quarterly*, 46(2), 229-273.

Gurin, P., Dey, E. L., Hurtado, S., & Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes. *Harvard Educational Review*, 72, 330–366.

Landivar, L., C. (2013). Disparities in STEM employment by sex, race, and Hispanic origin. American Community Survey Reports, ACS-24. Washington, D.C.: U.S. Census Bureau. Available online: <http://www.census.gov/prod/2013pubs/acs-24.pdf>.

11. #HonestlyIngenious

Barnett, R. C., & Sabattini, L. (2009). A short history of women in science: from stonewalls to invisible walls. In: T. Science, Ed. *The Science on Women and Science*. Enterprise Institute, Washington, DC.

Ferreira, M. M. (2003). Gender issues related to graduate student attrition in two science departments. *International Journal of Science Education* 25(8), 969-989.

12. #HonestlyUnaffected

Settles, I.H., Cortina, L.M., Stewart, A.J., & Malley, J. (2007). Voice matters: Buffering the impact of a negative climate for women in science. *Psychology of Women Quarterly*, 31, 270-281.

Stout, J. G., Dasgupta, N., Hunsinger, M., & McManus, M. A. (2011). STEMing the tide: using ingroup experts to inoculate women's self-concept in science, technology, engineering, and mathematics (STEM). *Journal of Personality and Social Psychology*, 100(2), 255.

13. #HonestlyInterdisciplinary

Eagly, A. H., & Karau, S. J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological Review*, 109(3), 573.

Felton, M., J., & Petkewich, R., A. (2003). Scientists create bonds with artists. *Analytical Chemistry* (75), 166-173.

14. #HonestlyInterdisciplinary

Banchefsky, S., Westfall, J., Park, B., & Judd, C. (2016). But you Don't look like A scientist!: Women scientists with feminine appearance are deemed less likely to be scientists. *Sex Roles*, 75(3-4), 95-109. doi:10.1007/s11199-016-0586-1

Nosek, B. A., Smyth, F. L., Sriram, N., Lindner, N. M., Devos, T., Ayala, A., ... & Kesebir, S. (2009). National differences in gender–science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences*, 106 (26), 10593-10597.