

## AMY KRAMER, Ph.D., P.E.

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*I am a passionate researcher, educator, and engineer dedicated to engaging engineers in critical reflection on the relationship between engineering and society. Through innovative scholarship and pedagogy, I aim to broaden conceptions of what it means to think like an engineer in a committed pursuit of fostering critically conscious, socially responsible, and inclusive engineers.*

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### EDUCATION

#### Ph.D. Engineering Education

August 2018 – May 2022

The Ohio State University, Columbus, OH

Dissertation Title: *Thinking Like an Engineer: Interrogating the Epistemic Hierarchy of an Engineering Community of Practice*

Advisor: Emily Dringenberg, The Department of Engineering Education

Graduate Minor: Women's, Gender and Sexuality Studies

#### M.S. Civil Engineering

September 2010 – May 2013

The Ohio State University, Columbus, OH

Thesis Title: *The Effectiveness of Seismically Designed Steel Framing Systems Subjected to Blast Loading*

Advisor: Hojjat Adeli, The Department of Civil, Environmental and Geodetic Engineering

#### B.S. Civil Engineering

September 2006 – June 2010

The Ohio State University, Columbus, OH

### PEER REVIEWED JOURNAL ARTICLES

- 1) **Kramer, A.**, Leonard, A., Desing, R., Dringenberg, E. (Accepted) Beliefs in engineering education research: A systematic scoping review. *Journal of Engineering Education*
- 2) **Kramer, A.**, Kajfez, R., Dringenberg, E. (Accepted) Ways of being smart in engineering: Beliefs, values, and classroom experiences. *International Journal of Engineering Pedagogy*
- 3) Braaten, B., **Kramer, A.**, Dringenberg, E., Kajfez, R. (2023). You're an engineer? You must be really smart! A theoretical discussion of the need to integrate "smart" into engineering identity research. *Studies in Engineering Education*, 4(2), 22–37
- 4) **Kramer, A.**, Morris, C., McCarthy, D., Dringenberg, E. (2023) An intervention to promote growth mindset and STEM self-efficacy of high school students: exploring the complexity of beliefs. *Journal of Pre-College Engineering Education Research*. 13(1), Article 1
- 5) Dringenberg, E., **Kramer, A.**, Betz, A. (2022) Smartness in engineering: Beliefs of undergraduate engineering students. *Journal of Engineering Education*. 111(2), 283-307

- 6) Dringenberg, E., **Kramer, A.** (2019) The Influence of Both a Basic and In-Depth Introduction of Growth Mindset on First-Year Engineering Students' Intelligence Beliefs. *International Journal of Engineering Education*. 35(4), 1052-1063
- 7) **Coffield, A.,** & Adeli, H. (2016). Irregular steel building structures subjected to blast loading. *Journal of Civil Engineering and Management*. 22(1), 17-25
- 8) **Coffield, A.,** & Adeli, H. (2014). An investigation of the effectiveness of the framing systems in steel structures subjected to blast loading. *Journal of Civil Engineering and Management*, 20(6), 767-777

## **RESEARCH EXPERIENCE**

### **Surfacing deeply-held beliefs about gender- and race-based minoritization in engineering (NSF Award #1943934)**

P.I. Emily Dringenberg, The Ohio State University, Columbus, OH  
Research Associate (May 2022 – August 2022)

- Assisted in a qualitative study to investigate the causal beliefs about gender and race-based minoritization in engineering.
- Responsibilities include qualitative data analysis, co-authoring (1) journal manuscript, and collaborating with graduate and undergraduate research associates.

### **Thinking like an Engineer: Interrogating the Epistemic Hierarchy of an Engineering Community of Practice (Dissertation)**

The Ohio State University, Columbus, OH  
Dissertation (August 2020 – May 2022)

- Designed and conducted a qualitative study informed by feminist perspectives to investigate the shared beliefs and practices that reproduce the epistemic hierarchies of an engineering community of practice.
- Explored how practicing engineers relate their engineering identity to the epistemic hierarchy of engineering.

### **Am I Smart Enough to be an Engineer? Study of Engineering Students' Beliefs and Identities Across Institutionalized Educational Pathways (NSF Award #1920421)**

Co-P.I. Emily Dringenberg, Co-P.I. Rachel Kajfez, The Ohio State University, Columbus, OH  
Lead Graduate Research Associate (August 2019 – May 2022)

- Conducted an exploratory, longitudinal study using interview data to capture the beliefs and identities of undergraduate engineering students with respect to smartness in engineering.
- Responsibilities included project management, data collection (semi-structured one-on-one interviews), data analysis (qualitative coding, data visualizations), authoring multiple conference proceedings and (3) journal manuscripts, corresponding with participants, coordinating the IRB, and collaborating with undergraduate research associates.

### **Systematic Review of Beliefs in Engineering Education**

P.I. Emily Dringenberg, The Ohio State University, Columbus, OH

Lead Graduate Research Associate (May 2019 – May 2022)

- Led a systematic review project with responsibilities including database searches, coordinating with a librarian, developing inclusion/exclusion criteria, meta-analysis, and authoring (1) journal manuscript.

### **The Formation of Engineering Students' Beliefs about Intelligence (NSF Award #1738209)**

P.I. Emily Dringenberg, The Ohio State University, Columbus, OH

Graduate Research Associate (January 2019 – August 2021)

- Assisted with a qualitative study that collected interview data to capture the first-year and senior engineering students' beliefs about smartness.
- Led a supplemental participatory mixed-methods project in collaboration with a local high school to explore high school students' beliefs about intelligence and STEM self-efficacy.
- Responsibilities included data collection consisting of semi-structured one-on-one interviews and surveys, qualitative data analysis and inferential statistics, authoring (2) journal manuscripts, and collaborating with an undergraduate research associate and high school science teacher.

### **The Influence of Both a Basic and In-Depth Introduction of Growth Mindset on First-Year Engineering Students' Intelligence Beliefs**

P.I. Emily Dringenberg, The Ohio State University, Columbus, OH

Graduate Research Associate (August 2018 – January 2019)

- Assisted with a mixed methods study that collected interview and survey data to understand the influence of a growth mindset intervention on first-year engineering students.
- Responsibilities included data analysis consisting of qualitative coding, statistical analysis, and authoring (1) journal manuscript.

### **The Effectiveness of Seismically Designed Steel Framing Systems Subjected to Blast Loading (Master's Thesis)**

The Ohio State University, Columbus, OH

Master's Thesis (September 2011 – May 2013)

- Designed and conducted a study utilizing the applied element method (AEM) to explore how seismically designed steel framing systems resist blast loading.

## **TEACHING EXPERIENCE AND CURRICULUM DEVELOPMENT**

**The Ohio State University, The Department of Engineering Education, Columbus, OH**

Lecturer (August 2022 – Present), Course Coordinator ENGR 1281/1282.02 (August 2023-Present)

- Instruct 72 undergraduate engineering students per semester teaching the fundamentals of engineering. Topics include engineering graphics, problem-solving, communication, programming, inclusive teamwork, and engineering design.
- Coordinate curriculum and content across nine sections of the first-year program.
- Implemented new content for the first-year program to integrate inclusive teamwork practices into the curriculum. Created inclusive teamwork modules and redesigned the software design project for ENGR 1281

**The Ohio State University, The Department of Engineering Education, Columbus, OH**  
Graduate Teaching Associate (August 2020 – May 2021)

- Instructed 20 undergraduate engineering students per semester teaching Inclusive Leadership for Emerging Professionals. Topics included strengths and values, social identities, implicit bias, microaggressions, power and privilege, inequity in engineering, the social construction of race and gender, navigating bias, and inclusive leadership strategies.
- Redesigned the inclusive leadership in engineering course by developing new learning objectives and aligning them with formative and summative assessments, class activities, and assignments.
- Implemented class activities incorporating active learning strategies and feminist pedagogical strategies.

**The Ohio State University, The Engineering Education Innovation Center, Columbus, OH**  
Graduate Teaching Associate (September 2010 – June 2012), Lead GTA (September 2011 – June 2012)

- Instructed 72 students per quarter in the Fundamentals of Engineering program.
- Led weekly labs introducing first-year students to various disciplines of engineering.

## **INDUSTRY EXPERIENCE**

**AKC Consulting, LLC, Columbus, OH**  
Owner, Structural Engineer (June 2017 – August 2022)

- Designed and analyzed reinforced concrete and steel industrial structures, specifically structures associated with bulk material handling and storage.
- Conducted structural inspections of bulk material storage structures (e.g., silos).
- Designed and analyzed reinforced concrete silos. Projects included the design of cement, clinker, and coal reinforced concrete storage silos, post-tensioning silo repair, and silo roof beam pocket repair.

**Schaefer, Columbus, OH**  
Project Engineer (July 2016 – June 2017)

- Designed and analyzed reinforced concrete, steel, wood, and masonry structures. Projects included a 1.3 million sq. ft. warehouse and distribution center, multiple senior living facilities, and a university science center addition.

**River Consulting, Columbus, OH**  
Associate Structural Engineer (December 2011 – July 2016)

- Designed and analyzed reinforced concrete and steel industrial structures, specifically structures associated with bulk material handling systems. Projects included a grain terminal renovation, a coal-fired power plant addition, a coal terminal expansion, a chemical plant reactor addition, a sulfur melting project, a food processing plant addition, and multiple reinforced concrete foundations projects for gas plants.
- Structural inspections/audits of grain facilities, cement plants, and reinforced concrete silos.

## **LEADERSHIP AND MENTORSHIP EXPERIENCE**

### **The Ohio State University, The Department of Engineering Education, Columbus, OH**

Course Coordinator ENGR 1281/1282 (August 2023 – Present)

- Manage all course materials (daily lectures and activities, assignments, exams, quizzes).
- Lead weekly meetings with the ENGR 1281/1282 instructional team.
- Mentor lead undergraduate and graduate teaching associates and oversee ENGR 1282 design project scenario development
- Mentor two graduate teaching assistants and eight undergraduate teaching associates per semester.

### **The Ohio State University, The Beliefs in Engineering Research Group, Columbus, OH**

Lead Graduate Research Associate (August 2018 – May 2022)

- Organized and managed bi-weekly research group meetings for the Beliefs in Engineering Research Group consisting of approximately six graduate students and two to three undergraduate students per semester.
- Mentored approximately two undergraduate research associates per semester.
- Facilitated an NSF-funded summer research experience (REU) for four undergraduate research associates.

### **AKC Consulting, LLC, Columbus, OH**

Owner, Structural Engineer (June 2017 – Present)

- Structural engineering team lead on multiple reinforced concrete silo design and inspection projects.

### **River Consulting, Columbus, OH**

Structural engineering team lead (January 2014 – July 2016)

- Led multiple structural engineering team projects including natural gas plant foundation projects, multi-million dollar food processing plant addition and renovation.
- Onboarded and mentored newly hired engineers.

### **The Ohio State University, Engineering Education Innovation Center, Columbus, OH**

Lead Graduate Teaching Assistant (September 2011 – June 2012)

- Responsible for organizing and managing weekly labs as well as the eight other GTAs in the program.

## **INVITED PRESENTATIONS**

- 1) **Kramer, A.** (2022) “Thinking like an Engineer; Interrogating the Epistemic Hierarchy of an Engineering Community of Practice” Invited presenter for the Arizona State University ASEE Graduate Student Seminar, Virtual
- 2) **Kramer, A.** (2021) “Cultivating a Culture of Inclusivity: Research Driven Approaches to Diversity and Inclusion in Engineering.” Keynote speaker at Schaefer’s 2<sup>nd</sup> Annual SMART Conference, Virtual

- 3) Dringenberg, E., **Kramer, A.** (2020) “Who is Smart? Educational Research on Smartness in Engineering.” Invited presenter for The Ohio State University Cognitive Science Club, Virtual
- 4) **Kramer, A.**, Wallwey, C. (2020) “What Does it Mean to be Smart in Engineering?” Invited presenter for the Purdue University School of Engineering Education Seminar, Virtual

### **REFEREED PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS**

- 1) Wallwey, C., **Kramer, A.**, Kajfez, R., Dringenberg, E. (2023). Exploring the changing beliefs of undergraduate engineering students about smartness and engineering. Proceedings of the Frontiers in Education Annual Conference, College Station, TX
- 2) Wallwey, C., **Kramer, A.**, Kajfez, R., Dringenberg, E. (2023). Findings and implications of an exploration into smartness in engineering. Poster and proceedings of the American Society for Engineering Education Annual Conference and Exposition, Baltimore, MD
- 3) Kesckemety, K., Grier, B., Morin, B., **Kramer, A.** (2023). GIFTS: Learning Theory Workshop Led to First-Year Classroom Innovations. Proceedings of the American Society for Engineering Education Annual Conference and Exposition, Baltimore, MD
- 4) **Kramer, A.**, Wallwey, C., Kajfez, R., Dringenberg, E. (2023). Exploring the changing beliefs of undergraduate engineering students about smartness and engineering. The American Educational Research Association Annual Meeting, Chicago, IL
- 5) **Kramer, A.**, Li, Y., Braaten, B., Kajfez, R., Dringenberg, E. (2022). Engaging undergraduate researchers: Contextualizing beliefs and identities about smartness in engineering. Poster and proceedings of the American Society for Engineering Education Annual Conference and Exposition, Minneapolis, MN.
- 6) **Kramer, A.**, Kajfez, R., Dringenberg, E. (2022). What Makes a Smart Engineer? The Cultural Practice of Smartness in First-Year Engineering Classrooms. The American Educational Research Association Annual Meeting, San Diego, CA
- 7) **Kramer, A.**, Braaten, B., Kajfez, R., Dringenberg, E. (2021). Who’s Smarter? Beliefs about Smartness and Self-Identities Across Institutionalized Educational Pathways into Engineering. Poster and proceedings of the American Society for Engineering Education Annual Conference and Exposition, Virtual.
- 8) Abrams, L., Jayakumar, A., Sheppard, L., **Kramer, A.**, Calbert, T. (2021). Empowering Engineering Students as Allies Through Dedicated Classroom Instruction. Proceedings of the American Society for Engineering Education Annual Conference and Exposition, Virtual.
- 9) **Kramer, A.**, Dringenberg, E. (2021). Who is Smart? High School Science and Engineering Students’ Beliefs about Smartness. Proceedings of the Collaborative Network for Engineering and Computing Diversity Annual Conference. Virtual

- 10) Braaten, B., **Kramer, A.**, Henderson, E., Kajfez, R., Dringenberg, E. (2020). Accessing Complex Constructs: Refining an Interview Protocol. Special Session and proceedings of the Frontiers in Education Annual Conference. Virtual
- 11) **Kramer, A.**, Dringenberg, E., Kajfez, R. (2020). Development and Refinement of an Interview Protocol to Study Engineering Students' Beliefs and Identities. Poster and proceedings of the American Society for Engineering Education Annual Conference and Exposition, Virtual.
- 12) **Kramer, A.**, Wallwey, C., Thanh, G., Dringenberg, E., Kajfez, R. (2019). A Narrative-Style Exploration of Smartness and Identity of First-Year Engineering Students. Proceedings of the Frontiers in Education Annual Conference. Cincinnati, OH.
- 13) Morris, C., Dringenberg, E., **Kramer, A.**, Ramaswami, A. (2019). Different Ways Undergraduate Engineering Students Construct Intelligence: A Focus Group Study. Student poster and proceedings of the Annual Frontiers in Education Conference. Cincinnati, OH.
- 14) Dringenberg, E., Secules, S., **Kramer, A.**, (2019). Smartness in Engineering Culture: An Interdisciplinary Dialogue. Proceedings of the American Society for Engineering Education Annual Conference and Exposition, Tampa, FL.
- 15) Carroll, T., **Kramer, A.**, Dringenberg, E. (2019). Intelligence and Smartness in Engineering: Gatekeepers to Diversity and Inclusion. Proceedings of the Collaborative Network for Engineering and Computing Diversity Annual Conference. Crystal City, VA.

### **JOURNAL ARTICLES IN DEVELOPMENT**

- 1) Kajfez, R., **Kramer, A.**, Braaten, B., Li Y., Dringenberg, E. (*In Development*) Am I smart enough to be an engineer? How undergraduate engineering students articulate they are smart enough for engineering. *Intended for the Journal of Engineering Education*
- 2) **Kramer, A.**, Dringenberg, E. (*In Development*) Thinking Like an Engineer: Shared Beliefs about the Epistemic Hierarchy of a Professional Engineering Community of Practice. *Intended for the Journal of Engineering Education*
- 3) **Kramer, A.**, Dringenberg, E. (*In Development*) Engineering Identity and the Epistemic Hierarchies of a Professional Engineering Community of Practice. *Intended for the Journal of Women and Minorities in Science and Engineering*
- 4) Dringenberg, E., Delpech, D. M., **Kramer, A.**, Wallace, L., Meskel, E. (*In Development*) How do we know? The ways in which faculty, staff and administrators justify their beliefs about the dominant cause of gender- and race-based inequities in engineering. *Intended for Studies in Engineering Education*

### **PROFESSIONAL SERVICE**

#### **The Ohio State University, The Departmental of Engineering Education Committees:**

- Engineering Education for Justice Committee, Member, August 2022 – May 2023

- Graduate Studies and Research Infrastructure Committee, Member, September 2020 – May 2021
- Capital Resources and Employee Welfare Committee, Member, September 2018 – May 2020

### **Journal Article Reviewer**

- The Journal of Pre-College Engineering Education Research, May 2023 – Present,
- The International Journal of Engineering Pedagogy, May 2023 – Present
- The Journal of Engineering Education, September 2022 – Present
- The International Journal of STEM Education, May 2021 – Present

### **Conference Proceeding Reviewer:**

- Collaborative Network for Engineering and Computing Diversity Conference, May 2021 – Present
- The Frontiers in Education Conference, March 2020 – Present
- The American Society of Engineering Education Conference, October 2019 – present

## **AWARDS AND HONORS**

**Editor’s Choice Paper for July 2022 Issue** July 2022  
Journal of Engineering Education

**Graduate Research Associate Leadership Award** May 2021  
The Ohio State University, The Department of Engineering Education

## **PROFESSIONAL MEMBERSHIPS AND AFFILIATIONS**

**American Educational Research Association (AERA)**, Member, 2021-Present

**National Society of Professional Engineers (NSPE)**, Member, 2020-Present

**American Society of Engineering Education (ASEE)**, Member, 2018-Present

**Structural Engineer’s Association of Ohio (SEAO)**, Member, 2016-Present

## **PROFESSIONAL DEVELOPMENT ACTIVITIES**

**Inclusive Excellence Program**, The Ohio State University  
Completed Level 1-2, September 2022-May 2023

**KEEN Entrepreneurial Mindset Professional Learning Community**, The Ohio State University,  
Participant, Autumn Session 2022