Across domains and environments, the ability to learn from and share knowledge within a community of peers emerges as a constant factor in successful work. My research focuses on understanding how peer interactions can increase learner success, with a special focus on the transference of valuable, but often tacit, practical knowledge. The goal of my research is to inform both virtual and physical learning environments, by studying how structured peer support can produce positive learning outcomes.

I take a growth mindset and achievement goal approach to this work, believing that the attributions people make about how learning operates are critical to achievement, and that positive peer learning collaborations can instill the adaptive attributions in individuals that then perpetuate a renewing cycle of productive behavior, leading to greater achievement. I draw from principles in Psychology, Human-Computer Interaction (HCI) and Design to conduct research that investigates both the origins of adaptive learning beliefs, and how technology can encourage productive collaborations between learners.

Beliefs about Performance Disclosure: Developmental Origins

In my doctoral research, I investigated the origins of maladaptive learning environments, focusing on young children’s beliefs and predictions about the disclosure of performance information in early achievement situations. These beliefs set the stage for later key behaviors; children often fail to seek needed help and fall behind in the classroom due to their concerns about disclosing failure.

My research examined the very beginnings of performance disclosure beliefs. Across seven experiments with over 900 preschool and early school-aged children in both the United States and China, I found that young children’s reasoning about classroom behaviors was impacted by peer interaction, and that these concerns increased with age. Using story scenarios, these experiments asked children to make predictions about a character’s disclosure, and examined young children’s beliefs about factors impacting this behavior. Children were found to predict less disclosure in a nonsupportive peer environment, and their overall predictions of disclosure decreased significantly with age; in the US, children strongly preferred to disclose success over failure. However, older children in China significantly preferred to disclose failure disclosure. These findings emphasized the importance of both peer interactions and cross-cultural awareness in early learning environments.

Further exploring learning beliefs, I conducted research on whether adult learners’ beliefs about free will would predict adaptive learning strategies, and how caste system beliefs influenced perceptions of intelligence in India. Two experiments found that US learners who were encouraged to adopt stronger beliefs in free will also persisted longer on a challenging cognitive task, and that adults who report a lower socioeconomic status were less likely to believe that one could achieve beyond innate ability. In India, I conducted one experiment which found that Indian adults who strongly believe that the caste system is important and predetermined were more likely to believe that intelligence is an innate ability which will not be impacted by education. Overall, this work suggests that philosophical and social category beliefs may be perpetuating achievement gaps between lower- and higher-class groups in a society by influencing negative beliefs about academic abilities.
This work was supported by the Anderson Fellowship and the Elizabeth Bates Graduate Research Award from UC San Diego. These projects have been presented at conferences to the Cognitive Development Society (2011), the Society for Research in Child Development (2013), and published in the British Journal of Developmental Psychology (DOI: 10.1111/bjdp.12077) and Developmental Science (accepted 2014; in press).

Peer Support for Developmental Learning

My work as a Fellow with the Design Lab at UC San Diego centers on practical problems that people face in transitioning between work and learning environments, and leveraging peer review to provide meaningful feedback and developmental opportunities to underrepresented groups who do not have access to traditional mentorship and feedback during these transitions. Despite their tremendous potential for beneficial impact, online learning environments are still a nascent technology facing both technological and conceptual challenges. For instance, in research I conducted on 171 participants’ beliefs about learning in an online Design course, I found that self-regulated learning strategies such as being able to monitor one’s own study habits significantly predicted grades and enjoyment of the course. Further, large numbers of learners are unable to access expert help and feedback to further their own development. However, high quality support and feedback from peers in these online systems can promote this development without relying on expert help, and participating in a peer collaboration system may even produce unique benefits for learners. My research therefore directly addresses the question of how peers can help each other in large online systems.

In the GradStudio project, I conducted three experiments investigating how peers provide online revision feedback for writing. Two experiments conducted an in-depth ethnographic survey of writing revision feedback solicited from 500 online peer reviewers, and found that untrained peer reviewers generated markedly fewer explanations, and sharper critical language than expert reviewers. In a third experiment, 86 graduate school applicants were invited to trade feedback on others’ anonymized application essays in exchange for feedback on their own writing. Participants were randomly assigned to review systems that asked for either numeric ratings and text feedback or text feedback alone, and this project found that peer reviewers gave significantly more explanations and more specific suggestions for change when asked to also provide numeric ratings. My current project expands this work into the realm of job applications, using peer review to help people to develop a coherent career narrative that better communicates their skills. These projects will be presented at the ACM Conference on Learning at Scale (March, 2015), as well as the Coursera Partners’ Conference (March, 2015).

Impact and Vision

My research has broad applications within Human-Computer Interaction, User Experience (UX) Research, and Educational Psychology. I believe that understanding the ways people learn, and the ways we can promote collaborative learning with new technology, will help us produce more valuable, productive, and joyful learning environments for all. Peer collaboration systems provide a means to make new, creative educational and professional development opportunities more accessible than ever before. My long-term research goals are to inform the design of depthful human-computer collaborative systems that provide opportunities for individuals to strengthen, deepen, and share their skills and knowledge.