LRDC Internal Grants Program

2020 - Present

Internal Grants Program Goals:

1. *To stimulate new collaborations among Center Scientists.*
2. *To stimulate new directions for Center activity which are intellectually exciting and have the potential to be financially sustainable.*

Process: *The competition is announced in December with a RFP. Proposals are due in February; awards are made by the Executive Committee i consultation with the Director & Associate Director in April.*

PI: Indicated in Bold

Awad year[1]	Grant Title	Faculty	Grant Focus	External Funding
2020	1. Can We Talk About Race? Racial Socialization in Homes and Schools, Youth's Critical Consciousness, and Academic Achievement	2020.1 **Bañales**, Wang, and Huguley	Youth challenge racial oppression by developing a critical consciousness (CC) of racism and other social issues. According to CC theory and research, CC is comprised of youth's *critical reflection* (i.e., the ability to identify social issues in one's community), *political efficacy* (i.e., a sense of confidence that youth can personally create social change), and *critical action* (i.e., involvement in individual and collective behaviors that challenge social issues). Youth who develop a CC often fare greater academic achievement and political engagement. CC is believed to allow the youth to have the ability to critique the structural nature of social issues as opposed to blaming themselves and their families for their negative position in these inequities. The proposed project makes two novel contributions to research on youth's perceptions of racial socialization, CC development, and academic achievement. First, this study recognizes that youth learn about race and racism in various developmental contexts, and Black and White youth may experience different racial socialization processes due to their different social	

[1] **All grants are for a two year period unless otherwise noted**.

			positions and identities. Examining both White and Black youth's perceptions of racial socialization in multiple developmental contexts will elucidate whether youth's exposure to more racial messages across home and school contexts relates to more positive CC outcomes (i.e., presence of a cumulative effect), or if exposure to messages in one context may compensate for the lack of discussion about race and racism in the other context (i.e., presence of a compensation effect). Second, this study is novel for its ability to test whether youth's CC mediates associations between parental and school racial socialization and academic achievement.
2020	2. Using Mindfulness Training to Support Engagement, Learning, and Retension in Undergraduate Introductory Physics Courses	2020.2 **Galla** and Nokes-Malach	This investigation develops and tests a novel theoretical framework to understand and mitigate sources of disengagement from Science, Technology, Engineering, and Mathematics (STEM) courses in college students. Central to our framework is ***psychological threat***, defined as the "perception of an environmental challenge to the adequacy of the self." We posit that students under psychological threat are more likely to disengage behaviorally (e.g., have lower persistence), cognitively and motivationally (e.g., use less self-regulated learning strategies), and emotionally (e.g., experience more negative affect) from STEM courses. Disengagement from coursework in turn predicts poorer long-term learning and retention. Critically, we suggest that reducing psychological threat can boost engagement, learning, and ultimately, retention. We focus in particular on one factor, ***mindfulness***, which has shown promise in clinical science to reduce stress reactivity and boost cognitive performance, but whose effect on academic engagement and learning is still largely unknown. Here, we test the hypothesis that mindfulness training can facilitate more adaptive stress appraisals, thereby reducing psychological threat and

			increasing engagement, learning, and retention in STEM. Our theory of change predicts a series of main and indirect effects linking mindfulness, psychological threat, STEM engagement, and learning and retention outcomes. The proposed research tests these predictions in an experiment with college undergraduates in introductory physics courses. We focus on introductory physics courses because they represent a gateway to both engineering and health science careers, and exhibit well-known challenges in terms of opportunity gaps for female students and students of color.
2020	3. Personalizing Family Routines to Support 3-Year-Olds' Math Skills	2020.3 **Leyva** and Libertus	Family routines are important venues through which children can develop foundational math abilities. Daily activities such as eating, grooming, and playing are unique opportunities for parents to support children's math abilities, from counting and comparing numerosities to talking about numerical information in abstract contexts such as money and time. There is wide variability in the extent to which parents support math abilities during family routines. This wide variability is not specific to parents from low-income and ethnically diverse backgrounds. Even middle-income, highly educated European American parents can do more to foster math development at home. Critically, teaching children "to view and describe the world mathematically" is one of the key recommendations by the IES for ensuring children's long-term success in math. But why do some parents provide more opportunities for math development than others? Potential explanations include parents' lack of time, resources and knowledge about how to best support math learning in an age-appropriate fashion. The current study tests the feasibility of a family math intervention that provides personalized math-learning activities

			tailored to each family and their specific daily routines in an effort to make it easier for parents to engage in regular math activities with their children.
2020	4. Police Stops and School Adjustment: Examining Underlying and Protective Mechanisms among Black Adolescents	2020.4 **Wang** and Del Toro	Scholars have extensively studied the unfair treatment of minority youth; however, researchers have traditionally investigated peers and teachers as the source of such behavior, leaving the longitudinal impact of unfair policing on Black youth's school adjustment unknown. Moreover, most studies have focused on parental racial socialization, such that the potential protective role of school and peer socialization remains unclear. Our proposed project will test the proposition that multi-sourced racial socialization confers protection against school maladjustment and detriments to youth wellbeing as they are related to the context of police surveillance. The proposed project will leverage three large-scale longitudinal datasets to examine the following research questions: (1) do police encounters predict Black youth's performance and problematic behaviors in school; (2) do physical and psychological health mediate the relation between police stops and Black youth's school adjustment, and (3) do racial socialization practices from parents, schools, and peers buffer the observed negative consequences of policing on school adjustment?

2021	1.Building pathways to equity in college STEM: Testing an ecological belonging intervention in high school precollege STEM programs	2021. 1 **Binning** and Iriti	This proposal aims to leverage the STEM PUSH Network to adapt, refine, and test the ecological belonging intervention in the precollege space for the first time while simultaneously offering the participating PCSPs the potential for a more efficacious change idea than what might be conceived and tested without the support of experts in STEM identity and sense of belonging. Although Binning's intervention has not been previously tested in high school classrooms or out of school programs, several related projects give us confidence that the intervention can be adapted for younger students. The adapted intervention will be tested using improvement science methodologies by up to 29 precollege STEM programs in 7 urban areas, reaching up to 2,000 students, providing a range of contexts in which to learn about the intervention's efficacy and will yield a deeper understanding of what intervention features work, for whom, and under what conditions, positioning the intervention for federal funding for validation and scaling. We propose to develop an adaptive change idea built from the successful college-level ecological belonging intervention and the corresponding tools, such as practical measures, for PCSPs to engage in iterative tests within their programs as part of their STEM PUSH work.

2. Parent-EMBRACE+R: Incorporating Elaborative Reminiscing into a Dialogic Reading Technology for Latino Child Literacy	2021.2 **Walker** and Leyva	Dialogic Reading is the most studied literacy program focused on helping families adopt book-sharing practices that promote the development of children's literacy skills. Parents learn to stop at each page and ask questions of their children, as they make repeated readings of the book. Through DR, parents encourage children to learn new words, formulate sentences, and over time, infer information from the text and retell the story on their own. A drawback of interventions such as DR is the substantial human and time resources needed to deliver the content to parents and provide support as parents implement the program at home. By delivering the content and providing support to parents via technology, it is possible to scale the intervention to reach many more families, while keeping the program's costs relatively low. PI Walker et al. developed an app that combines embodied cognition with DR to promote book reading at home in children ages 1-3rd grade. Called EMBRACE (Enhanced Moved By Reading to Accelerate Comprehension in English), EMBRACE follows principles of embodied cognition by engaging the reader in cognitive stimulation. The reader uses an iPad that presents texts and pictures much like a child's picture book. However, after reading most sentences, the app prompts the reader to move the pictures to correspond to the sentence. This movement has been demonstrated to yield to improved reading comprehension outcomes over typical reading practice. We have recently extended EMBRACE by adding a parent-facing interface to encourage parents to engage in DR by asking questions of their child (*Parent-EMBRACE).* While *Parent-EMBRACE* was designed for Latino communities, it's not clear whether DR is a culturally responsive and strengths-based program for these communities. This project aims to investigate the efficacy of incorporating elaborative reminiscing into a dialogic reading technology for Latino child literacy.

2022	1. Teaching Reading and Summarizing via Argument-focused Text Annotation	2022.1 **Ashley** and Fraundorf	Many students do not read well enough to thrive in college and beyond. One reading skill that many students lack is summarization. Summarization is important for closely reading complex argumentative texts in multiple academic disciplines, such as science, humanities, and law. Despite the importance of summarization, students have difficulty reading complex texts and understanding authors' arguments and counterarguments. This problem affects students in high school, community college, and even law school. Thus, researchers have identified a need for "adaptive instructional methods ... that can be delivered in a few sessions, [and that] focus on the specific summarization skills [...] and increase generalization and retention of those skills." Ashley and Fraundorf specifically target the legal domain and will develop a computer-supported environment for highlighting and annotating argument-related information—specifically, in the legal domain.
	2. Testing Links Between Motivation, Achievement, and Neurobiology	2022. 2 **Hanson**, Wang, Del Toro	Student motivation and engagement are critical to academic success and achievement in STEM fields; however, these constructs have been largely ignored by educational neuroscience. Leveraging neuroimaging and other neuroscience tools could allow for a better understanding of critical mechanisms and individual differences to predict STEM success. To increase and accelerate this understanding, Wang, Hanson and Del Toro will build on well-established psychological theories of motivation, synthesize insights from affective and cognitive neuroscience, and propose novel secondary data analysis.

3.Testing the Efficacy and Mechanism of a Glass Analysis Method Reading Intervention	**2022.3 Fiez,** Matsumura, Sandora, Beck	Fiez and colleagues will test the effectiveness and mechanism of a reading intervention based on the Glass Analysis method (Glass, 1973). Participants will be 6th grade struggling readers assigned to an intervention (N=24) or a wait-list control (N=24) group. The intervention effectiveness will be measured by comparing gains in basic reading skill for the intervention versus control group. Neuroimaging data will be used to test for a predicted relationship between the intervention and increased neural activity within a right hemisphere brain region associated with orthographic processing (the r-VWFA). This project builds from a line of basic cognitive neuroscience work led by Fiez that has sought to understand the role of a particular brain region, the visual word form area (VWFA).