Special points of interest:
- The STEM Engagement Study
- The School Engagement Study
- Meet our Team

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The Developmental and Motivation Research Laboratory Newsletter

University of Pittsburgh

The Developmental and Motivation Research Laboratory of the University of Pittsburgh is pleased to present its first issue of the laboratory newsletter. We hope to inform our readers of the numerous studies and events taking place at the lab and spread knowledge and interest in topics related to developmental and motivation research.

The primary goal of all of the studies conducted at the Developmental and Motivational Research Lab is to reduce risky health behavior and promote positive child and adolescent development. Our research centers on the impact of school, peer, and family settings on adolescent achievement and motivation and the effects of multiple ecological systems on the behavioral, social, and emotional development of youth from diverse socioeconomic and cultural backgrounds. Our research is multi-disciplinary and uses a range of methodological approaches to better understand the interplay of developmental processes across both academic and social domains in adolescence, and situate these processes within different ecological contexts.

In this issue, we focus on the topic of school engagement and the various ongoing studies that our research team at Pitt is working together to conduct. First, we highlight the two most prominent engagement studies going on at the lab right now—The STEM Engagement Study and the School Engagement Study. Then, we introduce you to our research team headed by Dr. Ming-Te Wang in collaboration with Drs. Jennifer Fredricks and James Huguley. We also introduce our lab staff as well as undergraduate/graduate student research assistants.

We then delve deeper into the findings of our studies and explain the next steps on our research team’s agenda. We highlight the importance of conducting research on student engagement in school and touch on two important topics of interest in engagement studies—emotion and thinking and women in STEM (science, technology, engineering, and mathematics) career fields.

Finally, we offer information on projects going on at the lab, some exciting upcoming events, and the best way to contact us.

The Engagement Studies in Western PA Schools

The School Engagement and STEM Engagement studies kicked off running in seven school districts in Western Pennsylvania last fall, including Pittsburgh Public, Norwin, Hampton, Fox Chapel, Woodland Hills, Propel, and Ellis. We are now piloting the engagement surveys based on literature and responses gathered last year from focus groups as well as interviews with students and teachers. The goal of each study is to better understand students’ and teachers’ characterization of engagement, how they become and remain engaged both in the classroom and in their school, and what cognitive and non-cognitive factors influence their engagement in learning.
The STEM Engagement Study

The STEM Engagement project focuses on adolescents’ and teachers’ perceptions of student engagement in math or science classes and their interests/involvement in science, technology, engineering, and/or math. The project is funded by the National Science Foundation. The main objectives of the project are to understand the ways in which students currently engage in math or science classes and the ways in which we can increase students’ engagement in STEM. The main purpose of the study is to develop a diagnostic tool so teachers can identify students at risk of losing engagement in school.

The School Engagement Study

Focusing on the contexts that make up “school”, the School Engagement study works to identify the characteristics of engagement and what it means to be engaged in academic, extracurricular, and social spaces in the school.

Funded by the University of Pittsburgh and the National Institutes of Health (NIH), the study hopes to understand how students engage in schools and how to encourage that engagement through the understanding of cognitive and non-cognitive factors (e.g., motivation, grit, emotion regulation, effortful control).

Having begun our research in October 2013, we have conducted interviews with 17 teachers and 20 students, and conducted 2 focus groups and 20 individual sorting tasks with students. The information shared by these participants will work to help us create a survey measure of engagement in school.

Our thanks go out to all of the teachers and students who shared their own thoughts and experiences with us. If you are interested in participating please contact our project coordinator, Jacqueline Schall at 412-624-6787 or by email at jds107@pitt.edu.
Meet Our Team

Ming-Te Wang

Dr. Wang received his doctorate in developmental psychology from Harvard University and completed postdoctoral training at the University of Michigan. Prior to entering graduate school, he was a teacher and school counselor in a rural middle school. A majority of the students were indigenous people, who often coped with alcohol-influenced homes and the crippling effects of poverty and discrimination. Promoting their motivation to learn and helping them to establish healthy self-identities and visions for the future were his priority and counseling code for them. This professional experience provided him with an insight into the complex web of psychological and contextual processes at play in child and adolescent development. He has been exploring how different social and cultural contexts promote the development and integration of academic and social competence in children, and using mixed methods designed to evaluate complex developmental pathways from childhood to adolescence.

In his free time Dr. Wang enjoys spending time with his wife and two little ones (five years old and ten months old), jogging, camping, fishing, and mountain climbing.

Collaborators

Jennifer Fredricks

Dr. Jennifer Fredricks received her undergraduate degree from Columbia University and her doctorate in Education and Psychology from the University of Michigan. She is a professor of Human Development at Connecticut College, where she also directs the Holloran Center for Community Action and Public Policy. Her research focuses on the contextual factors that are related to higher engagement in both school and out of school contexts, parent socialization of achievement, and the benefits of extracurricular participation. She has consulted with school districts on the measurement of student engagement and enjoys helping teachers to create more engaging classrooms. She is the author of the book, "Eight Myths of Disengagement: Creating Classrooms of Deep Learning". In her free time, she enjoys long-distance running, open-water swimming, and spending time with her 8 and 11 year old boys.
James Huguley

Dr. James P. Huguley is a Research Scientist in the University of Pittsburgh’s Center on Race and Social Problems and School of Social Work. His research focuses on promoting high academic achievement and other positive youth outcomes among African American students across school, family, and community contexts. Huguley’s current work examines racial differences in how students respond to various high school settings, and the implications of these differences for narrowing disparities in educational outcomes. Huguley also researches racial socialization practices in African American families and their impacts on education and mental health outcomes in adolescence. Prior to his academic career Huguley served concurrently as a secondary school teacher and as the co-director of a rigorous education and leadership development program for urban youth. Huguley received his bachelors in English-Secondary Education from Providence College, and both his masters in Risk and Prevention and doctorate in Human Development and Psychology from Harvard University. Huguley is a 2012-2013 National Academy of Education Spencer Fellow, as well as an Educational Research Fellow for the Latino Policy Institute.

Lab Staff and Graduate Researchers

Jessica Degol

Jessica is a post-doctoral fellow in the Lab, having completed her doctorate in applied developmental psychology from the University of Pittsburgh. Her research interests include self-regulation development, positive youth functioning, and female underrepresentation in STEM fields.

Jacqueline Schall

Jackie is the project coordinator in the Lab. She completed her MS in applied developmental psychology at Pitt and focused her research on adolescent sense of belonging and engagement. Her current research interests include the role of engagement in adolescent social and psychological well-being.

Alyssa Parr

Alyssa is a first year doctoral student in the Applied Developmental Psychology program. She has her M.Ed. in Educational Psychology from the University of Virginia. Alyssa is interested in student motivation and how diversity and culture shape motivation in school.
**Tara Hofkens**

Tara is in her 3rd year of the doctoral program in the Learning Science and Policy Program. Her interests are in social and emotional development and academic engagement. Tara also leads efforts to integrate developmental knowledge of adolescents and social emotional learning into the Master’s level pre-service program at Pitt.

**Julie Allerton**

Julie is a research assistant in the Lab. She received her Bachelor’s Degrees in Psychology and Nonfiction Writing at the University of Pittsburgh. Her research interests include creativity and innovation, teamwork, gender differences in the workplace, and female and minority underrepresentation in STEM fields.

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**Assistant Researchers**

**Undergraduate**

Nancy Mangel
Jerome Dopkin
Connie Suh
Rachel Ollivierre
Charlene Shin
Elizabeth Mortenson

**Graduate**

Ori Tamir
Katlyn Harmison
Molly Church
Maggie Boldry
Kate Roark
Caroline Altaras

Daniela Chmielewski
Hannah Sung
Lida Lin
Our Findings: A Snapshot

We asked students and teachers about the cognitive, emotional, and social components of engagement and found that many students have either internal or external perceptions of engagement. Students with internal perceptions believe that they are in control of how engaged they are in the classroom and feel like it is their responsibility as a student to be engaged. Students with external perceptions of engagement often think it is the teacher’s job to keep them engaged throughout the day and described disengagement as occurring when peers or social interactions are distracting.

Teachers and students both described that engagement consists of active participation, thinking, interest, and interaction in classrooms and broader school settings. Nevertheless, teacher and student perceptions of engagement and disengagement differed in some important ways. While teachers focused on cognitive and behavioral aspects of engagement, such as making eye contact, asking and answering questions, and demonstrating knowledge, students focused on affective experiences and social interactions as ways they know that they and their peers are engaged. To students, engagement consisted of making contributions to classroom learning, sharing ideas and perspectives, and feeling that school is important. Students also described that interest in classroom content can be a pathway to engaging behaviorally and cognitively. These differences are significant because they highlight a need for a shared definition of engagement between students and teachers in the classroom in order to improve the level of student engagement overall.

Students described that teachers and schools play a big role in their level of engagement, even more so than their peers in school. When students feel good about the relationships they have with their teachers and feel a sense of community in their school, they reported having higher levels of engagement across school settings.

Students also highlighted the role of social interactions in their engagement. Students like to be around peers who are engaged and like to have opportunities to work with their peers in the classroom.

Teachers noted that assessing their students’ engagement is hard work. Relying on behavioral indications, such as making eye contact and answering and asking questions, do not help them to know if their students are really connecting to the material and processing their learning.

Assessing student engagement may be especially difficult depending on the student. We found that students vary greatly in the way they described their own levels of engagement across classes.

These findings have enhanced our understanding of the differences between base level behavioral engagement, which is currently elicited from engagement measures, and deeper, more precise cognitive, behavioral, and affective indicators, which seem to characterize what it really means to be engaged.

We know that the ways students engage affectively, behaviorally, cognitively, and socially matter to their academic outcomes and wellbeing. Our continued analysis of interviews and surveys will help to frame the ways in which these aspects of engagement have an effect and to better understand how teachers, peers, parents, and personal and environmental characteristics matter to a students’ engagement in classrooms and broader school settings.
Next Steps

Processing our Findings

The Developmental and Motivation Research Lab is working hard to continue to analyze data from our interviews with teachers and students and from our surveys of student engagement. These analyses will examine the influences of teachers, tasks and activities, and school environments on the way that students engage. We will also explore the role of gender in engaging in science and math content. Our surveys will help us to further understand the differences in personal and family characteristics toward engaging in STEM and schools.

Learning More

With our the pilot phase of our STEM Engagement Survey nearly complete, we will be turning to pilot our School Engagement Survey with schools in the Spring months. In validating these surveys, we will continue to work to create a tool that teachers and schools can use to assess engagement among their students. This tool will help to identify individual engagement profiles, to help students know how they are engaging and teachers to know what may help, and trends across students to better understand the way engagement is affected in groups.

Pushing forward

After the School Engagement Survey is piloted we plan to conduct a longitudinal study of student engagement, following students for three years and measuring their engagement annually. We hope to identify different student profiles of engagement and investigate how students’ engagement develops from 9th to 12th grade, how schools and families support engagement, and the impact of school engagement on subsequent educational and career outcomes of students.

While we continue to learn what is important to student engagement, we are looking forward to continuing to work with the students, teachers, administrators and staff in our participating school districts who make this study possible. We will start our longitudinal study phase in the Fall of 2015.

Why Student Engagement Matters

Research indicates that by high school as many as 40-60% of young people are showing signs of school disengagement. This is a concern because disengagement is often a precursor to dropping out of school. For many students, dropping out of high school is not an instantaneous event but the last step in a long process of disengagement from school. Our lab incorporates cognitive, emotional, motivational, and sociocultural factors of engagement to investigate engagement with a multi-dimensional approach. It is not clear which aspect of engagement is most important for educational outcomes. However, we know that school engagement can be a protective asset that decreases the chance of negative behaviors and increases the likelihood of successful transition to adulthood.
In “Staying Engaged: Knowledge and Research Needs in Student Engagement” by Wang and Degol (2014) of the University of Pittsburgh, key features of student engagement and past research surrounding this hot-button topic in today’s world of education are reviewed. The authors begin by distinguishing the difference between motivation and engagement. Motivation is commonly understood to be the energy that produces the state of engagement. In other words, engagement consists of student behavior, feelings, and brain activity while motivation is the invisible driving force of those very factors (p. 137). In studying student engagement, the issues of dimensions and hierarchy come forth. Research remains divided on the parameters that contain student engagement. Some say student engagement works on a hierarchy of school community, classrooms, and specific school assignments. Others contend that engagement is emotional, behavioral, cognitive, agentic (student influence on teacher to make learning richer) or a combination of several dimensions. Lack of consistency amongst researchers can lead to confusion in the field (p. 138). In reviewing the body of research that exists on this topic, one sees that a person-centered approach is invaluable in gaining insight into the ever changing, context-based, and success predicting concept of student engagement.

Looking into the future, the authors see the need for incorporating neuroscience technologies into student engagement studies in order to research the effect of emotion upon student engagement in a deeper, more comprehensive way than has been done up to this point in time. As alluded to before, there is also a need to study student engagement as a multi-faceted construct in order to gain a broader and deeper understanding of the variables that play a part in student engagement levels (p. 139). Seeing how varying engagement levels in various contexts influence a student can also reveal much about this construct. It is also unclear how the different dimensions of engagement interact with one another. Some say that all levels of engagement act independently and do not have any influence on other contexts, others argue that emotional engagement is a must have in order for other types of engagement to occur, while still others contend that engagement contexts influence one another in a cyclical fashion, certain levels in one context making certain levels in other contexts possible (p. 140). Furthering the discussion on needs in the engagement research field, the authors point out the lack of studies done on elementary aged children and the influence of students’ previous educational experiences on their current level of school engagement. Interventions also tend to be focused on short-term goals and apply universal measures. The narrow breadth of these boxed in efforts do not focus enough upon the student as an individual (p. 141). Another area of need in engagement research is the study of mixed messages that surround students on a daily basis. Different values coming from students’ families, peers, and the school itself may play an important role in determining a student’s engagement level. Additionally, the study of student personality is also in need of further development in relation to engagement. A survey of characteristics that make successful students be who they are can yield insight into the makeup of individuals that are engaged in learning. This learning can also happen outside of the traditional school setting. Extracurricular activities shape student characters in a variety of complex ways; studying this phenomenon is crucial as well (p. 141). Overall, Wang and Degol highlight the vast amount of work that still remains to be carried out in the research field of student engagement. Admitting, to imperfection and incompleteness however, is a sure sign of a step in the right direction. Wang and Degol’s arguments leave much to be discussed in moving forward in the field of student engagement.

Reference

Emotion and Thinking in Student Engagement

A recent article printed on the psychology website Psychcentral.com discussed a study on student engagement published by Dr. Wang. In the article, the author commented on the common misconception that student engagement relies solely upon school attendance and student behavior like turning in homework and participation. Although these elements do contribute to student engagement levels, a much overlooked variable to the engagement equation exists. Emotion and thought are just as critical, if not more significant, factors that affect the engagement of students in school settings.

Students’ feelings and thoughts about their teachers, curriculum, and school environment cannot be discounted if one wants to understand more about the intricacies of student engagement. Positive relationships with both teachers and peers as well as meaningful assignments are some of the key factors that students themselves marked as influences on their personal engagement in school. Nevertheless, Dr. Wang reminds us that it is impossible to pinpoint a set of universal variables in the student engagement equation that match the academic narratives of all students. Not only does this provide insight on the complexity of student engagement research projects like those held at the Developmental and Motivation Research Laboratory, but it also serves as a reminder to all those involved in the field of education, that knowing your students well remains the key to success.

Refocusing the Lens on the Lack of Women in STEM Fields

“Perhaps we have been placing too much emphasis on the lack of females in the field instead of concentrating our effort on highlighting what women in STEM fields actually bring to the table.”

Why do young women turn away from STEM (science, technology, engineering, and mathematics) careers? Many possibilities have been debated, and research studies are still seeking to find an answer to this question. A study conducted by Dr. Wang and his colleagues found that young women actually top men when it comes to a combination of high math and verbal skills. However, it seems that after high school, college-bound female graduates tend to turn away from STEM fields because of a perceived lack of options in these career paths. There appears to be a widespread misconception amongst young women that careers in the STEM fields involve little contact with people and a low level of flexibility for those women who someday hope to have a family. As a recent Huffington Post article suggested, it might be time to refocus the lens on this controversial issue. Perhaps we have been placing too much emphasis on the lack of females in the field instead of concentrating our effort on highlighting what women in STEM fields actually bring to the table. This deficit mindset not only adds very little to the conversation around women in STEM fields but it also contributes to the negative self-perceptions that many young women hold in regards to their own skills in these academic areas.
Other Ongoing Projects at the Lab

- **The Social, Emotional, and Behavioral Development Project** studies the independent and conjoint effects of multiple ecological systems (e.g., family, school, and peer) on the risky behaviors, developmental competences, and socioemotional wellbeing of youth, particularly from low-income and minority backgrounds, the impact of school transitions on adolescent behavioral and psychological adjustment, and the developmental impact of school- and family-based interventions targeting adolescent academic skills as well as developmental problems (e.g., substance use, depression).

- **The Racial and Gender Stigma Experiences, Identity Development, and Academic and Socioemotional Development Project** examines the impact of racial and gender stigma experiences and social agents’ (e.g., parents, teachers, peers) beliefs on the development of racial, gender, and academic identity for minority students; whether racial and gender identities among minority students can serve as protective factors against the effects of stigma experiences on academic and socioemotional development; whether racially distinct parenting practices and the quality of teacher-student relationships moderate the impact of stigma experiences on academic and socioemotional development.

- **The Family/Parental Involvement and Child Development Project** aims to broaden and refine current parenting theories; incorporates developmental and cultural wealth perspectives to identify effective parenting and parental involvement practices across racial and socioeconomic spectrum; develop theoretically-grounded measures of family/parental involvement in education; and enhance the family-school partnership and promote children’s academic achievement and mental health.

Upcoming Events

- **Teach and Lead Workshop at Ellis– January 20:** Active learning classrooms are flexible, mobile and fluid. Active learning promotes student-centered, hands-on activities that engage students in STEM topics in new ways. The Ellis School recently re-designed its STEM curriculum and learning spaces to include more blended learning and flipped classrooms and studied learning outcomes with researchers from the University of Pittsburgh. At this event, you’ll hear how active learning increases student achievement in STEM, and correlates to higher levels of engagement, healthy risk-taking, and confidence. Meet Dr. Ming-Te Wang, Associate Professor at Department of Education and Psychology and Dr. Adam Leibovich, Associate Chair of the Pitt Physics Department. They will share their research and will discuss best practices. Leave with a plan and be prepared for how you might change your STEM curriculum!

- **The Center for Motivation in Learning and Education– Coming soon:** This upcoming interdisciplinary research center at the University of Pittsburgh will provide leadership on motivation, learning, and child development studies. It will also advance the development of non-cognitive factors and learning in formal and informal settings for students from pre-K to undergraduate. The center will research elements that affect student motivation, improve STEM instruction especially for women and minority students, provide training for college students interested in these topics, and form community connections with local schools to bridge the gap between research and practice. See the website for further details: [http://www.education.pitt.edu/ResearchService/CentersInstitutes/CenterforMotivation.aspx](http://www.education.pitt.edu/ResearchService/CentersInstitutes/CenterforMotivation.aspx)
**Motivation Speaker Series:**

**Dr. Nadia Chernyak** - *Learning Through Doing: Children's Learning About Morality Through Choice*

Choice is critical for a variety of positive developmental outcomes, including self-esteem, well-being, and intrinsic motivation. The intuition that our actions are freely chosen is also important for our causal reasoning and our moral evaluations of others. In this talk, Dr. Chernyak will explore the interplay between young children’s concepts of choice and their emerging morality. She’ll first discuss how children conceptualize choice, and whether young children reflect on their own actions as freely chosen. She’ll then turn to developmental and cultural variations in our concepts of choice. Finally, she will discuss 1) how (and why) choice serves as a mechanism that encourages internal motivation, and how it might influence prosocial behavior in early childhood, and 2) whether choice might be a domain-general way of learning about ourselves and others. Future directions will focus on how to foster young children's concepts of choice and how children’s understanding of choice promotes learning.

Dr. Chernyak received her PhD in Developmental Psychology from Cornell University and she is a current research fellow at Harvard University and Brown University. She studies cognitive development in early childhood.

January 6, 2015, 10:00-11:30, 5604 Posvar Hall at the University of Pittsburgh

**Dr. Brian Galla** - *The Disciplined Mind: Self-Control and the Psychology of Achievement*

This talk explores the nature of motivational conflict during academic work and how competencies (or lack thereof) in self-control play out in students. The talk also examines the relationship between self-control and traditional measures of achievement, the mechanisms through which self-control operates to promote positive outcomes, and mindfulness-based strategies that facilitate the expression of self-control in children and adolescents.

Dr. Galla received his PhD in Educational Psychology from UCLA and he is a current research fellow at University of Pennsylvania. He studies motivational factors that support academic achievement and positive youth development.

January 8, 2015, 10:00-11:30, 5604 Posvar Hall at the University of Pittsburgh

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**Other Notes**

Dr. Wang is accepting doctoral students and undergraduate volunteers to help with on-going research projects at the lab! Visit the website or contact the lab for more information.

**We’re on the web!**

wangresearch.pitt.edu

**Contact us at:**

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**Developmental and Motivation Research Laboratory**

Wesley W. Posvar Hall