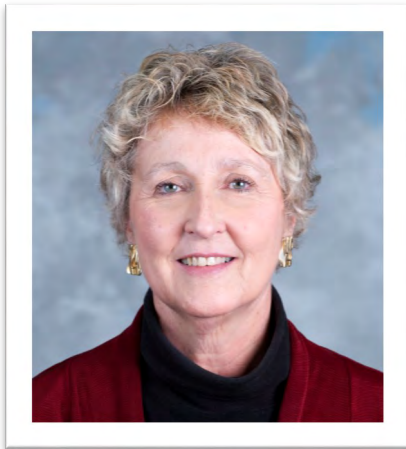




SUMMER 2018: NEWS FROM THE UNIVERSITY OF MINNESOTA

# Gunnar Lab for Developmental Psychobiology Research



**Greetings from Professor Megan Gunnar:** The Gunnar Lab research continues to study the impact of early experiences through our work with families formed through international adoption and Minnesota-born families. Much of our work over the past year focused on the development of teens and of children as they transition to adolescence. I am especially grateful for the work of [Professor Rich Lee](#) and his students in the [Familee Lab](#) who work with young adults who were adopted from Korea. Rich's work helps us understand the experience of international adoption as it relates to identity and the experience of discrimination.

The overall goal of the Gunnar Lab's research is to study stress and the experiences that shape how the body deals with stress. In this newsletter issue, you can read more about our latest research studies examining stress during pregnancy and its effect on the developing fetus, stress during the transition to adolescence, a very challenging time of life, and stress encountered in social situations where children attempt to meet and work with new peers. You will also read about the impact of early institutional care on adolescent health.

Thank you to all the families who have taken part in our research.

*Regents Professor Megan Gunnar*

# Early Life Stress, Growth, and Metabolic Health Study

By Brie Reid

**W**ith the help of 30 internationally-adopted youth (ages 9 to 18 years) and 90 youth who were matched to each internationally-adopted youth by age and body mass index (weight relative to height), we examined metabolic and cardiovascular health with state-of-the-art technology.

Many internationally-adopted children arrive to their families growth-delayed, with a significant percentage meeting criterion for height stunting (< 5% height-for-age). After adoption, most children experience catch-up growth and soon fall within age norms for height and weight.

Research suggests that the initial stunting and rapid catch-up growth can increase a child's risk for later physical health problems. Researchers think that this is the case because in the first 1,000 days after conception, young, growing bodies determine whether the environment they are growing up in is rich or poor in nutritional resources. In this way, our bodies "calibrate" to the environment we expect to grow up in. Early physical adaptations (like height-stunting) to environments with very few resources may increase risk for obesity, metabolic syndrome, and cardiovascular disease for children who shift from resource-poor to resource-rich environments.

You might remember our earlier findings in the Puberty Study, where we found that adopted youth who were height-stunted were *not* at an increased risk of obesity. Our group wanted to be sure that we were properly assessing all of the aspects of metabolic and cardiovascular

health that are relevant to internationally-adopted children and teens. To do that, we teamed up with Dr. Aaron Kelly in the Department of Pediatrics, who specializes in cardiovascular and metabolic health, and Dr. Don Dengel in the School of Kinesiology, who specializes in high-tech measurements where fat is deposited in the body.

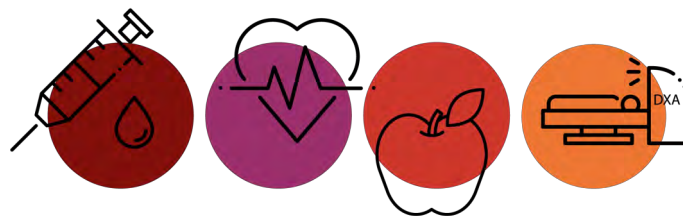
## What did we measure?

### Body composition

We measured total body fat and visceral adipose tissue (the fat around the gut) with dual X-ray absorptiometry, which is a special x-ray tool that gave us an inside look at how much fat there was and where fat was located. This tool also helped us measure bone mineral density. One can be thin but still store a larger percentage of fat in the gut, which increases cardiovascular risk.

### Cardiovascular Health

In addition to blood pressure, we also measured arterial stiffness and heart rate variability. Arterial stiffness refers to how flexible our arteries are – we want flexible arteries because our heart has a lot of variability in how much blood it needs to pump through our body, less when we are at rest and much more when we exert ourselves physically. When our arteries are flexible, our heart can do its best job pumping blood around our body. Heart rate variability refers to the variation in the time interval between heartbeats. A healthy heart at rest has higher variability between heart beats.



## Diet & Blood Tests

Participants also filled out a food diary so we could understand how their diet might play a role in their health. We also took a blood sample to measure blood lipids, fasting glucose, and fasting insulin.

## What did we find?

Compared to non-adopted children of the same age and body mass, youth adopted internationally from orphanages or institutions with a history of mild to severe height-stunting at adoption:

- Were NOT more likely to have more overall body fat
- Were more likely to have higher bone mineral density, but both groups had bone mineral density within normal and healthy ranges for the age group.

Versus comparison youth, youth adopted internationally with a history of height-stunting at adoption also:

- Were more likely to have early indications of arterial stiffness, even though they were relatively lean like our comparison youth.
- Were more likely to have a higher proportion of trunk fat.
- Were more likely to have less lean mass overall and less lean mass in the hips, buttocks and thighs.
- Were more likely to have higher systolic blood pressure.
- Were more likely to have higher total cholesterol triglycerides, LDL cholesterol, and insulin.

*Metabolic Health, to page 5*

# Math is harder when you're being watched

By Max Herzberg

Each of us responds to stress in different and unique ways. How these individual differences arise between people is yet to be fully understood. Sometimes the stressful circumstances we encounter are very intense—things like dangerous accidents—but often the stressors we experience in our everyday lives—like giving a short speech at school—are much milder. Even in these mildly stressful situations, however, our bodies respond by releasing a hormone called cortisol to help us face them. According to prior research in adults, only 60% of people produce additional cortisol when they experience social stress, while the other 40% do not. We believe that this difference may be, in part, due to differences in the patterns of brain activation in adolescents who produce a cortisol response compared to those who do not.

Over the past year, our research group has developed a new task to collect cortisol samples during a stressful task while youth have their brain's scanned. After a preliminary set of pilot data in a simulated brain scan, we began collecting data at the Center for

Magnetic Resonance Research, one of the best brain imaging centers in the country. To date, more than twenty adolescents, from 11 – 14 years old, have come to the University to participate in a brain imaging session. All of our participants are asked to lay down in the scanner and give a speech about themselves while two judges watch and appear to rate their performance on a closed-circuit TV connection from another room. In addition to giving the speech, participants complete a set of multiple-choice math problems on a screen in front of them, once while the judges watch and appear to rate them, and once when there is no one watching their performance where no one knows their scores. Throughout the session we record the participant's brain activity to see how their brains react to giving a speech and doing math with and without the pressure of judges watching them.

Our results suggest that, like adults, not all adolescents produce cortisol in response to the speech and math—it is almost a 60% to 40% split in youth as well. These groups are often called "Responders" and "Non-Responders,"

respectively. Further, participants showed different patterns of brain activation when they did the math task with the judges compared to without the judges, regardless of their cortisol responses. Figure 1 shows this difference in brain activation: Youth displayed more activation in the anterior cingulate cortex (ACC; Figure 1a) and dorsal lateral prefrontal cortex (dlPFC; Figure 1b) when being judged compared to when they were not being judged. These brain regions are often associated with maintaining attention and regulating emotions—two things that are likely important to performing well under pressure.

When we finish our data collection we will have the data to ask two key questions: 1) What is the difference between stress responders and stress non-responders? Are the non-responders doing worse on the math problem? Do they do worse on the speech? Or are they doing as well as the responders, but with less physiological effort? 2) What are the differences in brain activity for responders and non-responders? Are the non-responders better at keeping their fear system in check, for example,

more control over the amygdala? Answers to these questions should help us identify ways of helping children who have significant performance anxiety do better on tasks that require them to perform in front of others.

To help us learn more about adolescent's brain response to stress, we encourage families with children 11-14 years old to participate in the Minnesota Imaging Stress Test in Children (MISTiC) Study. Please contact

Max Herzberg at [herzb020@umn.edu](mailto:herzb020@umn.edu)

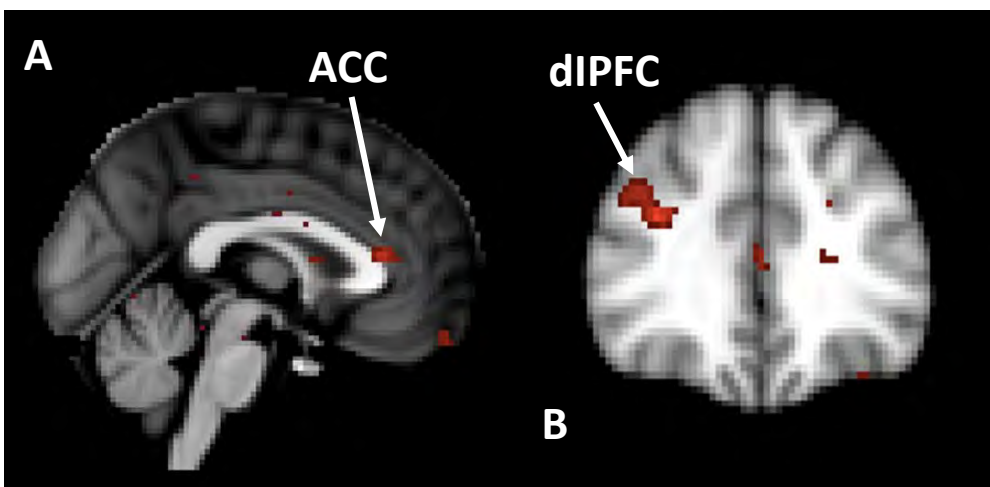


Figure 1. Greater brain activation in the anterior cingulate cortex (ACC) and dorsal lateral prefrontal cortex (dlPFC) when completing math problems under pressure compared to completing math problems without pressure.

# Puberty Stress Recalibration Study

By Carrie DePasquale, Nicole Perry, Anna Parenteau, and Megan Gunnar

The Puberty Study reached final enrollment of 321 participants. We retained 85% of families through year two of assessments and about 70% of families have returned for year 3 assessments. There are about 10% of families that have yet to complete year three assessments.

## Evidence of Recalibration of Stress System Functioning

The primary reason for conducting the Puberty Study was to determine whether the stress system, first trained under the conditions of orphanage/institutional rearing, would recalibrate its functioning around puberty now that the child was living in supportive, well-resourced homes. We examined this by looking at morning cortisol levels, which so far have not shown evidence of pubertal recalibration with late adopted children showing more blunted morning levels of cortisol, and with children's cortisol stress hormone responses to a public speaking and arithmetic task.

We have now examined the children's responses to the public speaking task the first time they did it. As seen in Figure 2, our results showed, as we expected, that children adopted internationally from orphanages show a blunted cortisol stress response if they are earlier in pubertal development. This is consistent with our evidence in previous studies and evidence collected by colleagues studying children in Romanian orphanages. Studies of children experiencing trauma have also shown this type of blunting of physiological stress reactivity.

Notably, however, for children adopted internationally from orphanages who were screened as in later stages of pubertal development, we saw no difference in cortisol stress response to the public speaking task. This was our prediction and the reason for the study, thus it was gratifying to see that puberty may open up a window for "normalizing" the stress system. Of course, we need

to verify this by seeing whether we can examine the same children as they move through pubertal development to know if we can see the same shift in stress functioning. Stay tuned.

## Emotion Regulation

The ability to regulate negative emotions is a critical skill. Children who are unable to regulate anger and frustration are more likely to lack behavioral control and engage in aggression and defiance. Ineffective regulation of fear and anxiety can often lead to rumination over the source of distress or the suppression of negative affect, both underlying anxiety and depression. The inability to down-regulate negative emotions also makes engaging in socially appropriate interactions with peers and teachers more difficult and it hinders children's ability to engage with increasingly challenging academic and social tasks that occur as children progress through the school context. Children who have

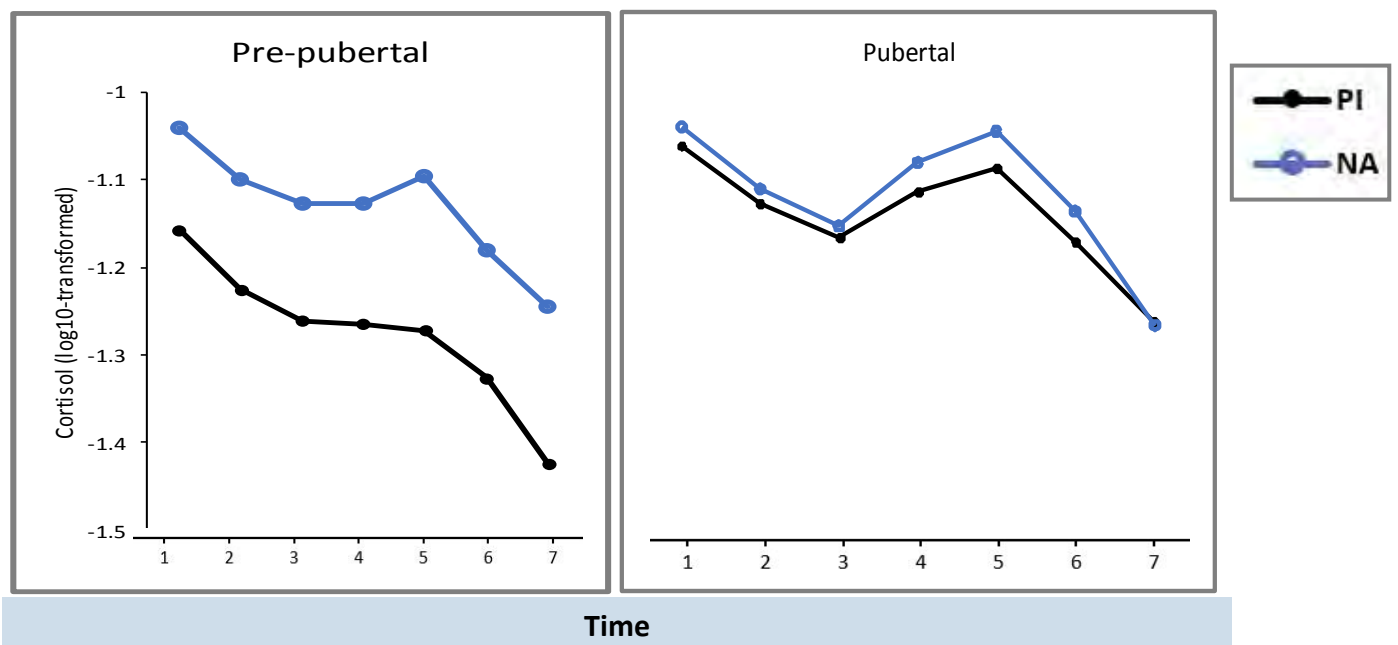


Figure 2. Cortisol stress response between youths who are in pre-pubertal and post-pubertal development.

experienced early adversity have been found to struggle in school, have difficulty with friends, and display more behavior problems. Thus, problems in emotion regulation have been described as possibly underlying many of their difficulties.

Emotion regulation develops most rapidly in the first few years of life. A responsive and supportive caregiving environment plays a key role in the development of emotion regulation such that through repeated interactions, emotion regulation skills that were once facilitated by caregiver support are thought to become engrained in the child's own self-regulatory skillset.

Experiencing adversity early in life in the form of institutionalized care may contribute to deficits in emotion regulation later in life.

In the Puberty Study, we hypothesized that children and adolescents who were internationally adopted after being in institutional care would have fewer emotion regulation skills during a social stress test than their non-adopted peers. Further, we were interested in the physiological cost of regulation. We hypothesized that a cortisol response to social stress may be helpful but a biologically expensive tool for regulation. Finally, we tested whether emotion regulation skills were associated with academic, behavioral, and social adjustment in the same way for children experiencing early life adversity and their non-adopted peers.

In this study, children completed the speech portion of the Trier Social Stress Test (TSST). Trained research staff watched videos of the children's speech and rated the extent to which they were able to regulate their anxiety and engage in the speech. Cortisol was collected at intervals before and after the speech to assess cortisol reactivity to social stress, and parents reported on children's adjustment.

Results indicated that at younger ages, children who experienced early institutional care did not differ from

Thus, when children who experienced early institutional care are able to regulate despite their anxiety, it may come at a higher physiological cost.

non-adopted children in their emotion regulation abilities. However, by age 13, children who experienced early life adversity were on average observed to struggle more with regulating their emotions than their non-adopted peers. That is, their skills during the speech did not increase with age as much as those of their non-adopted peers. This

suggests that all children show increasing emotion regulation skills with development, but children experiencing early adversity may lag behind, resulting in an increasing gap in emotion regulation at later ages.

We also found that greater emotion regulation skills were associated with an increased cortisol response during

the speech for children who had experienced early adverse care, while greater emotion regulation was associated with a lower cortisol response for non-adopted children. Thus, when children who experienced early institutional care are able to regulate despite their anxiety, it may come at a higher physiological cost.

We also examined the relations between regulating emotion during our speech task and children's emotional and behavioral problems according to parents. Here we found no association for the non-adopted children, but a significant association for the adopted children. Specifically, for them being able to regulate despite anxiety was associated with few parent-reported behavior problems.

In conclusion, we may foster the development of children who have had adverse early life histories by helping those who struggle to control their behavior and anxiety to better regulate their emotions; this may be particularly important during adolescence, a time of increasing social and academic challenges, if children who experienced early institutional care start to fall behind their non-adopted peers. We should also recognize, however, that controlling and regulating their emotions may tax them more biologically than children who have not experienced early adversity.

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### *Metabolic Health, from page 2*

These findings above suggest that youth adopted internationally with a history of height-stunting might be at an increased risk of cardiovascular and metabolic issues later in life.

### **What we recommend:**

If your child had a history of height-stunting at adoption, we recommend talking with your health care provider

about cardiovascular and metabolic health. Many of our participants had a normal BMI, and it is not typical for health care providers to screen for cardiovascular and metabolic health concerns when a young patient is not overweight or obese. **Our results do not mean that your child is unhealthy, or has cardiovascular or metabolic health issues.** Our results suggest that this might be something for your child to keep track of as they grow older, and talking with your child's health care provider is the best next step.

# Transition into the Family: Peer Follow-Up Study

By Carrie DePasquale

As we have mentioned before from the Transition into the Family study, children adopted internationally tend to have an under-active stress-regulatory system and produce too little of the stress hormone cortisol. These children who produce too little cortisol may also be more likely to have difficulties with peers upon entering kindergarten. The Peers follow-up study examined whether this problem persists into middle childhood, when the children are 8-11 years old, because this is when children have increasing independence and peer interactions become more complex. For this study, 58 children from the original Transition into the Family Study were paired with another same-age, same-sex child to play several cooperative games. During these games, we measured cortisol production, interaction quality, positive affect, and conflict.

Last year we told you that internationally adopted children seem to be doing just as well as their non-adopted peers during these interactions. This year, after nearly doubling the number of participants, we were

encouraged to see that this pattern remains. As you can see in Figure 3, internationally adopted children (the “PI” group) interacted just as well, showed just as much positive affect, and had just as little conflict as their non-adopted peers (the “NA” group). This finding is promising, as it shows that internationally adopted children can improve socially over time.

However, we looked a little deeper and found something very interesting. It seems that, even though children adopted internationally interact with peers just as well as non-adopted children, at least according to our scoring, the way children *respond* to internationally-adopted children may be different. Figure 4 shows that regardless of whether internationally adopted children were showing positive or negative affect, their peer tended to respond more negatively to them. Conversely, when non-adopted children were positive, their peer was positive, and when they were negative, their peer was negative. This was true of their cortisol production as well. This may mean that there are certain social cues in these interactions that

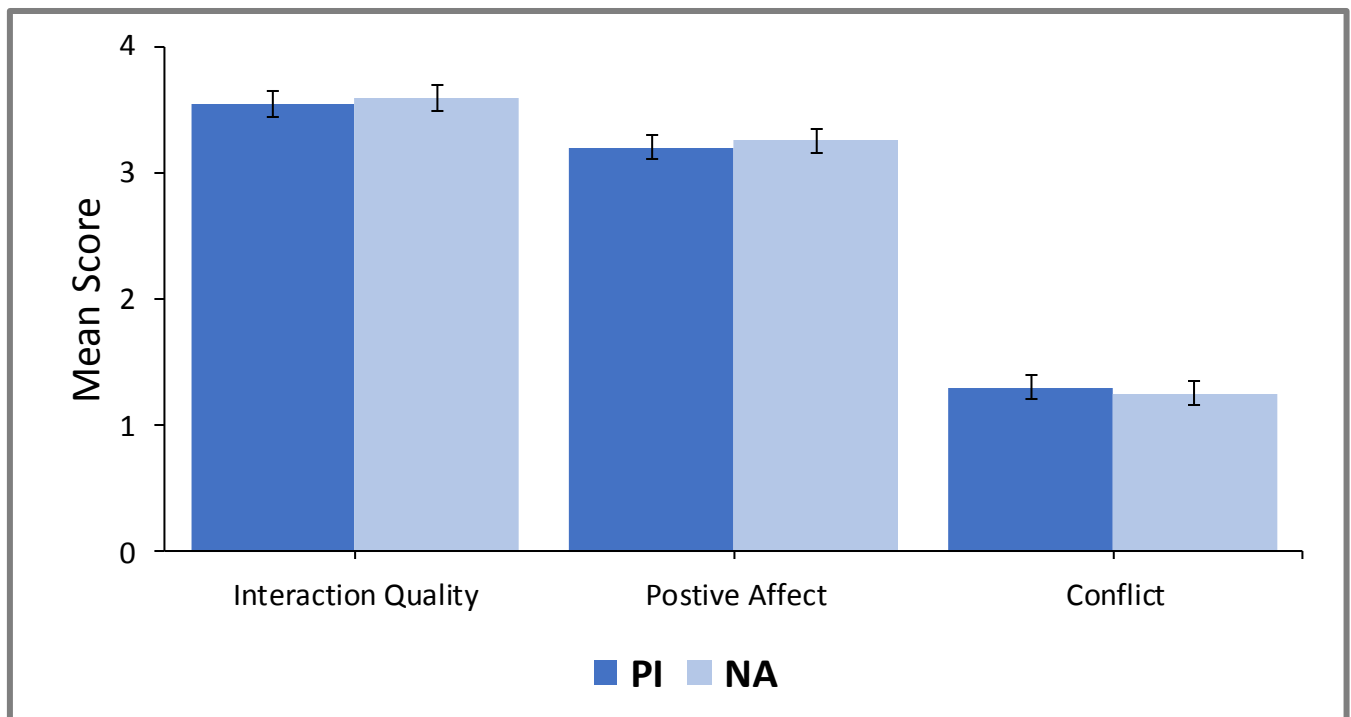


Figure 3. Average behavior scores during a social interaction with a new peer for children adopted internationally (PI) and non-adopted children (NA).

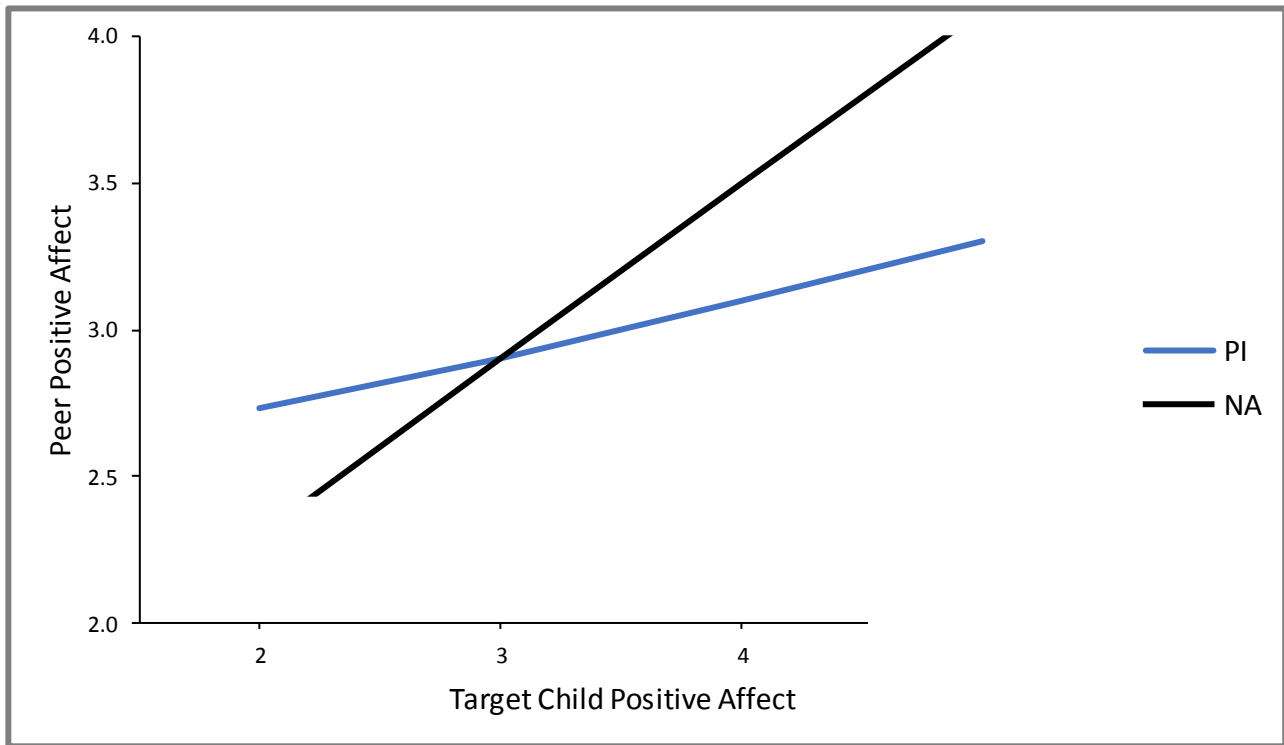


Figure 4. Levels of child positive affect when interacting with either an internationally-adopted child ("PI") or a non-adopted child ("NA"). "Target child positive affect" indicates the child from the Transition into the Family study, whether internationally adopted or not. "Peer positive affect" refers to the peer they were paired with. As you can see, peer positive affect was more responsive to NA children's affect. With NA children, peer affect was positive when they were positive and negative when they were negative. With PI children, peer affect was unrelated to the PI child's affect.

peers are picking up on that we have not. While internationally-adopted children's social behavior seems to improve over time, there may be some nuances of these peer interactions that we still do not understand.

The results of this study are reminiscent of a study we reported on several years ago conducted by Clio Pitula (now a licensed clinical psychologist and assistant professor at Children's Hospital Colorado). In the BDNF Study, Dr. Pitula examined parent-reports of peer rejection among internationally-adopted teens and found greater reported rejection, even though parents reported similar social behavior towards peers. She also reported that peer rejection for PI teens, as for NA teens, was predictive of higher depressive symptoms. Thus, both of these studies together indicate that we need to better understand the social cues that internationally-adopted, orphanage-reared children are sending that lead to poor peer responses. If you or your children have ideas about this, we would love to hear them. Feedback can be directed to [iap@umn.edu](mailto:iap@umn.edu)



# Gunnar Lab & The Research Network on Toxic Stress and Health

By Shanna Mliner and Megan Gunnar

**D**r. Gunnar is honored to be part of the [Research Network on Toxic Stress and Health](#), a group with sites throughout the United States in collaboration with the American Academy of Pediatrics and the [Harvard Center on the Developing Child](#). As part of the work of this Network, we have led two research studies working with Children's Hospitals and Clinics of Minnesota: The Toddlers & Parents Study and the Toddler Attention Study, both described below.

Adversity experienced early in life increases the risk for a variety of physical and mental problems accruing over the lifespan. These children are at increased risk for lifelong problems in learning, behavior, and health. Excessive stress may also increase risk for a host of chronic health impairments such as cardiovascular disease, hypertension, diabetes, addictions, and depression. However, not all children exposed to adverse conditions suffer these consequences. There is a clear need for measures to identify children whose health is affected by extreme stress. If addressed early, the impacts of early adversity can be reduced or reversed. Long before children get to school, pediatricians are in a good position to act as sentinels to identify the children and families who need more help.

But how can pediatricians identify the children who need intervention because of excessive stress? Figure 5 shows the pathways through which excessive stress is expected to influence physical and mental health. The network we are part of is working to develop measures of stress, immune

and cellular functioning reflecting adjustments to excessive stress and neurocognitive effects sensitive to excessive stress. The Gunnar lab is working on studies of stress biology and neurocognitive functioning.

## TODDLERS & PARENTS STUDY

Our Toddlers and Parents Study was our study of factors influencing stress biology. The Toddlers and Parents Study was conducted in two pediatric community clinics as part of Children's Hospitals and Clinics of Minnesota.

Cortisol is a hormone that is affected by stress and affects physical and mental development. We studied 190 children as they got either the 12, 15, or 18 month vaccinations. Secure attachment is important in regulating cortisol levels and reactivity. To measure attachment, a researcher followed the children throughout the clinic visit and during a free play session immediately afterwards. The researcher was observing how confidently the child used the parent as a source of security during the visit. Parents provided information about the family's income, stresses, and the parents psychological functioning.

Some of the families attending these clinics were struggling with poverty and the results showed that poverty was associated with the toddler producing higher levels of cortisol overall during the well child appointments if the toddler was insecurely attached to the parent, but not if the relationship was secure. Poverty in Figure 6 is defined as being below 150% of the federal poverty limit (FPL). All of the children showed a cortisol response to the inoculations, which would be expected. But if you notice, the securely attached children, regardless of family income, show a decrease in cortisol or stress during the physical exam, while the insecurely attached children show an increase or start high and stay high in producing cortisol during the physical exam period. This suggests that they are not able to use the presence of the parent to buffer or lower stress during this part of the clinic visit.

These findings tell us that we probably need to measure both the stressors in the children's lives and the protective factors, like a secure relationship with their parents, in order to really identify the children

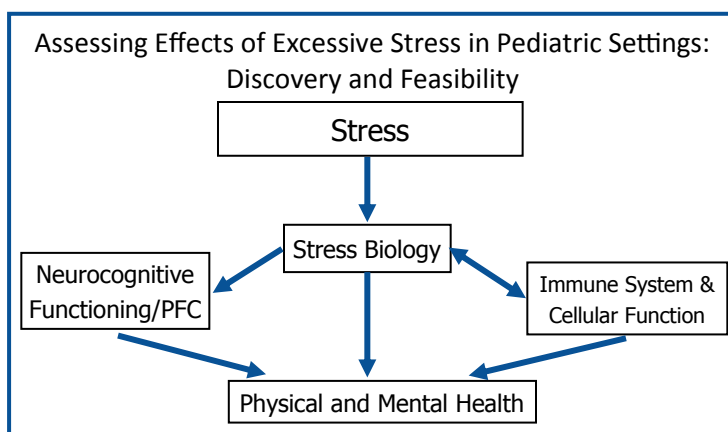


Figure 5. Pathways of how stress influence physical and mental health.

in need of additional support. This could be challenging in a quick pediatric visit.

### TODDLER ATTENTION STUDY

Regulation attention is a facet of neurocognitive functioning that is very sensitive to chronic stress. But there are no good and easily deployed measures of executive attention regulation that are available before age two. Because regulating attention is so critical to self-control and capable functioning at school, early detection is really important. It is especially important because with early detection there are likely many interventions that could work to improve children's executive attention skills.

The goals of the Toddler Attention Study are to determine whether infants/toddlers who experience stress in their families may demonstrate delays in the development of executive function, social orienting, and joint attention skills and whether these possible delays in attention development can be effectively assessed in the pediatric clinic setting using new tools.

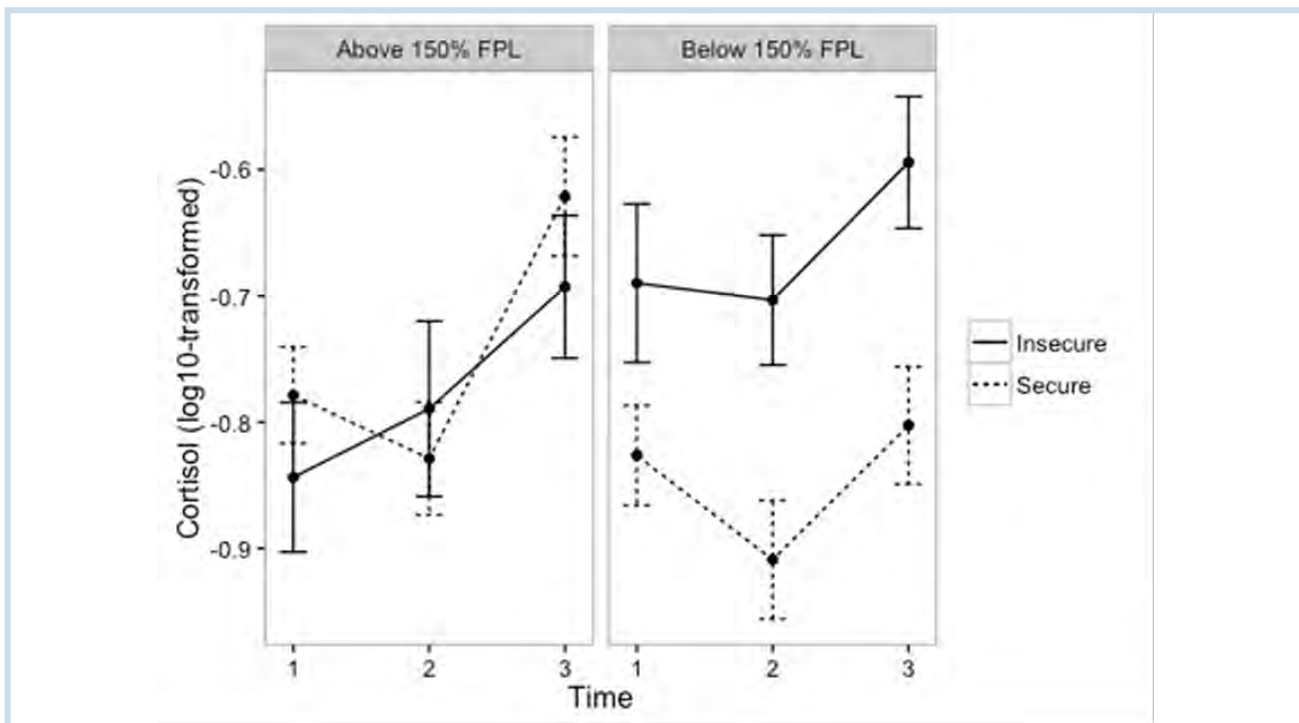
We have been working with colleagues in the Institute of Child Development who are developing tasks that use eye tracking to determine what babies are thinking and how they are processing information. Our goal is to figure out whether these tasks can be deployed on a tablet and used in the midst of a pediatric visit. And if we can get good data in that

setting, we want to know whether the scores we are seeing for the children reflect chronic levels of family stress or not.

This study is underway and we have currently completed 102 appointments with families of 9 month-olds (n=38), 12 month-olds (n=43), or 15 month-olds (n=21) at their well-child visits. We expect to complete this study by next winter and hope to share results with you in next year's newsletter!



*A tablet task tracking eye movements while a 12-month old baby watches a short video.*



*Figure 6. Cortisol responses at 1 - clinic arrival, 2 - after physical exam, and 3 - after immunizations.*

# Women and Infants Study of Health, Emotions, & Stress (WISHES)

By Colleen Doyle and Erica Smolinski



No pregnancy is stress free, although *prenatal stress* can manifest in different ways for different women. From a research perspective, prenatal stress is a complex umbrella term that encompasses many experiences, including frustration with daily hassles, symptoms of anxiety or depression, and life circumstances such as financial concerns, the death of a loved one, or a disaster like flooding. Overall, prenatal stress includes experiences that drive us “N.U.T.S.”, in that these things are *Novel, Unpredictable, Threatening to our survival or our sense of self*, and they foster a *Sense of lacking control*. This acronym isn’t meant to make light of prenatal stress, but rather to help us remember that prenatal stress occurs when a woman has more things coming at her than she can manage.

A growing body of research has linked different levels of these different types of “prenatal stress” experiences to both positive and negative outcomes for women and their developing children. For example, mild levels of prenatal stress have been linked to enhanced motor and cognitive development in infancy. In contrast, more intense or chronic experiences of prenatal stress have been associated with increased risk for an earlier birth, as well as problems with learning and controlling emotions during childhood.

The mechanisms that link

women’s experiences during pregnancy to long-term child outcomes are complicated and not completely understood. However, recent research suggests that prenatal stress might influence child outcomes by impacting brain development before birth. The goal of the WISHES study is to increase our understanding in this area. We hope to learn more about how women cope with stress during pregnancy, and how their experiences during pregnancy may “get under the skin” of their developing children to influence their brain development, behavior, and health. We think our study has the potential to make important contributions to how parents, pediatricians, and policy makers can help set up lifelong trajectories of health and well-being by supporting

women’s mental and physical health during pregnancy.

## What’s involved in participating in the WISHES study?

To study the question of how prenatal stress may influence the health and development of women and their children, the WISHES study is following women and their children from early in pregnancy through the first few months of life. Women enroll in the study between 8-16 weeks of pregnancy, and complete questionnaires on stress, emotions, and health behaviors 5 times during pregnancy and 1 time after pregnancy. At 4 time points during pregnancy, women also complete fetal monitoring sessions, which involve placing electrodes on the woman’s belly to measure her baby’s resting heart rate.

We look at fetal heart rate because it is a “downstream” marker of fetal brain maturation; as central nervous system development unfolds during pregnancy the brain increasingly controls the heart, and in turn resting heart rate patterns show expected patterns of organization and change. Therefore, by measuring changes in resting fetal heart rate during pregnancy we are able to understand how prenatal experiences may play a role in setting up different trajectories of brain development. At 3 time points during pregnancy and 1 time point following pregnancy, women also provide a small hair sample, which allows us to measure



Research suggests that prenatal stress may have a persisting impact on child development by influencing brain development before birth.



A WISHES participant during a fetal monitoring session. Electrodes placed on pregnant women's bellies allow us to measure fetal heart rate indices that reflect central nervous system development and help us learn how prenatal stress experiences may impact a baby's brain development before birth.

more pre- or postnatal study visits. This aligns with prevalence rates of previous studies examining prenatal stress. For us, it also underscores an important point that is often overlooked in this area of research – prenatal stress is *not* exclusive to the prenatal period. This is important because it means that researchers, health care providers, and policy makers – not to mention partners, family members, and friends – have many opportunities during pregnancy and after delivery to help and support women and their children.

**Join us for the WISHES study!**

Every day we are learning more about how experiences during pregnancy may play a role in a child's growth and development. However, we have much more to learn. This WISHES study will be the first to connect the dots between prenatal experiences, brain development across pregnancy, and brain and behavioral development during the first two years of life. This will allow us to significantly advance our understanding of how prenatal experiences may play a role in setting up different trajectories of brain and behavioral development.

Women and families can be compensated up to \$210 for participating. For many of the prenatal visits we are able to meet with women at their homes. For all visits held at the U of M, we provide free parking and child care for older siblings. [For more information on the study please email us at wishes.umn@gmail.com](mailto:wishes.umn@gmail.com)

cortisol production during pregnancy. Cortisol is a hormone that helps our body cope and respond to challenging situations. During pregnancy, cortisol also helps mature fetal tissues, such as the lungs, and may impact the development of the central nervous system and brain. Finally, at 2 time points women complete a short computer game while we track their eye-movements, in order to understand how differences in attentional styles may play a role in whether or how women experience stress during pregnancy.

**Study enrollment and data collection**

So far, 81 pregnant women have enrolled in the WISHES study. Recruitment is ongoing, and our goal is to include up to 120 women. To date, 32 women and their children have completed all visits. As data collection is also ongoing, at this time we are not yet able to report on any significant findings. However, preliminary results suggest that approximately 15-20% of participants report clinically significant levels (i.e., levels that impact their day-to-day functioning) of depression or anxiety at one or



Research suggests that approximately 15-20% of women experience a "clinically significant" level of prenatal stress at some point during the perinatal period, a finding that we are seeing replicated in the WISHES study so far.

# ADOPTION MEDICINE NEWS

The International Adoption Project maintained by the Gunnar Lab is often confused for the Adoption Medicine Clinic. Although we are separate groups, we collaborate and support one another. We bring news from the Adoption Medicine Clinic.

## FIVE REASONS TO CONSIDER AN ADOPTION MEDICINE CLINIC ASSESSMENT FOR YOUR FOSTER CHILD

Comprehensive assessments can help address the medical, developmental, cognitive and mental health needs of children who have experienced early adversity.



Adoptive Medicine Physician Judith Eckerle, MD, leads the University of Minnesota Health Adoption Medicine Clinic. The clinic team specializes in providing comprehensive assessments that address the medical, developmental, cognitive, and mental health needs of internationally or domestically adopted children. (Photo Courtesy of Jonathan Chapman/JCP)

**International or domestic adoption?** It's one of the first decisions parents must consider along their road to adoption. No matter their place of origin, adopted children often face similar challenges. Like their international counterparts, children adopted domestically or from the United States foster care system may have been exposed to traumatic experiences or adversity, may have received inconsistent medical care or may need

early behavioral intervention.

**Founded in 1986**, the University of Minnesota Health Adoption Medicine Clinic has cared for children adopted internationally, domestically or from the U.S. foster care system. Over the decades, the clinic became a global leader in research, education, advocacy, and adoption medicine.



**Our care team specializes in** providing comprehensive assessments that address the medical, developmental, cognitive and mental health needs of children who have experienced early adversity from lack of permanency, trauma, abuse and neglect. We asked Adoption Medicine Physician Judy Eckerle, MD, to share five reasons why the parents of foster children or children adopted from within the United States should consider having an assessment. Here's what she had to say:

**Children who experience foster care and adoption may have multiple risk factors that can cause delays in physical and cognitive development and mental health.** These risk factors may include prenatal substance exposure(s) and stress, nutritional deficiencies, lead poisoning, exposure to neglect or trauma, lack of opportunity and other potential challenges. These experiences may affect speech, learning, strength, and coordination—or a child's everyday life skills, such as getting dressed, tying shoes, or writing. A child's ability to self-regulate their behavior, mood, and energy throughout their day may also be adversely affected. Studies show that many children in the foster care system have unaddressed medical issues. With proper assessment and treatment, we can decrease the risk of future medical and emotional health needs and other social risks.

**Children in foster care and those adopted may not have had consistent medical care to address their often complicated histories.** The Adoption Medicine Clinic's team of pediatric specialists—including a pediatrician and developmental therapists—will

provide a comprehensive assessment of the child's family, medical and developmental history (when available). Our team will also conduct a medical exam including lab work, Fetal Alcohol Spectrum Disorder (FASD) screening and an assessment of developmental skills. This will help identify the child's needs providing current diagnosis and referrals whenever possible.

**The Adoption Medicine Clinic will provide your family with a road map of next steps.**

We provide education for parents, a children's primary care doctor, caregivers and staff about the child's needs. We also provide home and school programming recommendations, including suggestions to incorporate into home routines or special learning plans. We can help referrals to other appropriate specialists and resources as needed:

- Psychology and mental health
- Physical rehabilitation, speech or occupational therapy
- Hearing, vision, dental care
- Neuropsychology
- Genetics

**When parents and caregivers understand the needs of their child, they are better prepared to meet those needs and help their child thrive.**

Research clearly shows that it is beneficial for parents to understand a child's strengths and weaknesses. Once a child's medical and emotional needs are known, they can be addressed to the best of our abilities. Helping families, schools and providers understand a child is the greatest way we can help them reach their potential.

**The earlier we can intervene, the greater chance we have to minimize future challenges.**

Academic or behavioral struggles may become more apparent as children grow older or advance to the next grade level. Waiting to seek help until puberty or later can complicate underlying issues.

For example, an undiagnosed medical condition left untreated can further exacerbate potential problems and compound physical or cognitive delays. In other instances, children may receive a diagnosis or treatment that does not seem to help—or may even hinder the child.

These scenarios are not uncommon for children who experience early adversity, trauma and abuse. While seeking help at the earliest point is ideal, we can assess a child or a young adult at any point in his or her development. After an assessment, families are encouraged to return to our clinic for regular check-ins and follow up care. Parents can also seek our advice if they have new or ongoing concerns that have not been resolved. The Adoption Medicine Clinic offers a team of experts to identify and meet a child's needs.

**Call to schedule an appointment at 612-365-6777.**

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[www.adoption.umn.edu](http://www.adoption.umn.edu)

## Congratulations to Dr. Judith Eckerle!

The Adoption Medicine Clinic Director has been named a RISING STAR for a second year in a row by Mpls St. Paul Magazine. She is featured in the April 2018 issue: <http://mspmag.com/health-and-fitness/rising-star-doctors-in-the-twin-cities-2018-edition/>



## PARTICIPATE IN RESEARCH

### 11-Year Follow-Up on Families with Korean Adoptees

We are now recruiting for an eleven-year follow-up survey of families who have children adopted from South Korea. In 2007, more than 400 International Adoption Project (IAP) families completed surveys on the development and well-being of their adopted Korean children, ages 6-12. In 2014, seven years later, we followed up with these parents and their Korean adoptee teens (ages 13-19). Now in 2018, we are once again seeking the participation of families with Korean adoptees!

We would like to see how everyone is doing as these children are now in (or transitioning into) young adulthood. We are specifically interested in learning more about the life experiences of both the parents and the adult (or soon-to-be adult) child.

#### Participants Requirements:

- Families must have participated in either the 2007 **and/or** the 2014 IAP Survey on the Development and Well-Being of Korean Adoptees.
- Korean adoptee must be currently 17 years-old or older.

One parent and one adoptee will each complete a short online survey. If only the adoptee or parent wants to participate, that's ok too. We will be compensating for your time and effort with Amazon gift cards.

Thank you for being a part of this exciting journey for the past 10+ years! Your participation in the past has led to an increasing knowledge and understanding about the well-being of Korean adoptees and their families.

Interested or need more information? Email us at [koradopt@umn.edu](mailto:koradopt@umn.edu) or contact the IAP Adult Registry at [IAP@umn.edu](mailto:IAP@umn.edu)

This research is being conducted by Professor Richard Lee and his research team in the Department of Psychology at the University of Minnesota.

### Thank You From our Nurses

We want to express our appreciation to the children and their families for the opportunity to be part of their dedicated participation in the important research of pubertal development at the University of Minnesota these past 4 years. What a privilege it

has been to be part of your journey of great change and experience the courage, commitment, and contributions of time and trust in this study that will have meaningful and positive impact for children in the future.

*Wishing you all the very best - Jan Goodwalt, RN,  
Terri Jones, RN, Melissa Stoll, RN.*

# IN THE COMMUNITY:

## Greater Minneapolis Crisis Nursery

**T**he Greater Minneapolis Crisis Nursery, located in South Minneapolis, provides 72-hour crisis care for children aged birth-6 years in Hennepin County. This means that parents encountering a crisis can bring their children to the Crisis Nursery for 3 days of overnight care, ensuring that their children are safe and cared for while they manage the crisis.

This is an immensely important resource available to families who have inadequate social and economic support systems, while also buffering children from experiencing the worst of the crisis. To that end, the Crisis Nursery works tirelessly to constantly improve their program and train staff to make the experience as positive as possible for children.

Most children who use the Nursery have experienced significant stress and trauma. That is why Dr. Gunnar and her graduate student, Carrie DePasquale, have partnered with the Nursery to implement stress-reduction techniques inspired by mindfulness theory to better help children manage strong emotions and promote self-regulation while at the Nursery. Over the past year, staff have rated these techniques as effective in calming/reducing stress 89% of the time! The ultimate goal will be to assess improvements in child behavior, and then connect with parents to teach them these strategies as well. This may promote more long-term benefits to children's development in the context of adversity.

The work in the Crisis Nursery was partly inspired by earlier studies conducted by Dr. Gunnar's former graduate students, Jamie



*Carrie DePasquale, Ph.D. student at the Institute of Child Development - UMN, partners with Crisis Nursery implementing stress-reduction techniques.*

Lawler (now a professor at Eastern Michigan State University) and Elisa Esposito (now a professor at Widener University, Pennsylvania). Results from the Self-Control Study showed that a 6 week summer class in mindfulness-based training for internationally adopted school-aged children 6-10 years, helped them regulate better and exhibit more prosocial behavior according to teacher's report.

Want to use mindfulness-based techniques with your children? Try taking deep "belly breaths" with your child and doing a body scan. While breathing, draw attention to each part of their body (from their nose to their toes!) and ask your child how it feels.

Interested in donating or volunteering at the Crisis Nursery?

Visit their website at [www.crisisnursery.org](http://www.crisisnursery.org)

## GUNNAR LAB

Institute of Child Development  
University of Minnesota  
51 East River Road  
Minneapolis, MN 55455

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### Gunnar Lab and Staff

#### INVESTIGATORS

Megan Gunnar, *Regents Professor*  
Richard Lee, *Professor*  
Brad Miller, *Pediatric Endocrinologist*

#### STAFF & STUDENTS

Jennifer Armerding, *Clinical Interviewer*  
Carrie DePasquale, *Graduate Student*  
Christopher Desjardins, *Statistician*  
Bonny Donzella, *Senior Research Fellow*  
Colleen Doyle, *Graduate Student*  
Melissa Engel, *Graduate Student*  
Jan Goodwalt, *Registered Nurse*  
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Keira Leneman, *Graduate Student*  
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Medicine Clinic

#### ONLINE EDITION

[www.cehd.umn.edu/icd/research/gunnarlab](http://www.cehd.umn.edu/icd/research/gunnarlab)

This newsletter is published annually by the Gunnar Lab at the University of Minnesota's Institute Of Child Development for families who have partnered with us in our research work. Correspondences can be sent to Gunnar Lab, 51 East River Road, Minneapolis, MN 55455. For address corrections, please contact us at IAP@umn.edu or 612-626-8949.

