

## Minnesota International Adoption Project (MnIAP)

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Dear Parents,

We are sending you this letter as a way of thanking you for participating, or being willing to participate, in research with the International Adoption Project. This letter is being sent to all of the parents who have joined our international adoption registry as well as parents who have participated in international adoption research with their birth children. We would like to thank all 3,800 of you for your willingness to participate in research.

This year we are doing things a little differently. Due to funding restrictions, we are distributing our newsletter primarily by e-mail this year. This will hopefully allow us to distribute information to as many parents as possible, with out the tremendous cost of printing and mailing the newsletter. We are happy to send out a paper copy upon request. Please e-mail requests to [iap@umn.edu](mailto:iap@umn.edu). You may also access past newsletters from our website. <http://education.umn.edu/icd/IAP/>

Also, it is important that we continue to gather families who have recently welcomed home a child so that our registry continues to represent the current international adoption community. If you know any family whose child has just come home or has yet to join our registry, we would appreciate your making them aware of this registry. The families do not have to live in Minnesota, nor do they have to have adopted in Minnesota in order to be included in this registry. Any family with a child up to the age of 18 is welcome.

We would also like to take this opportunity to ask you to keep us updated with current e-mail, phone, and mailing contact info. This ensures that we will be able to reach you in regards to research projects and with next year's newsletter. Please e-mail contact info changes to [iap@umn.edu](mailto:iap@umn.edu) or call 612.624.9322.

Thanks again for your help and support!

Megan Gunnar  
and the International Adoption Project team



# MN International Adoption Project

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## Preliminary Results from Studies of Brain and Behavioral Development

Over the past three years, many families from the IAP registry have participated in studies relating to brain and behavioral development in internationally adopted children. Thank you so much for your help with this research! As promised, here are our preliminary findings from this work.

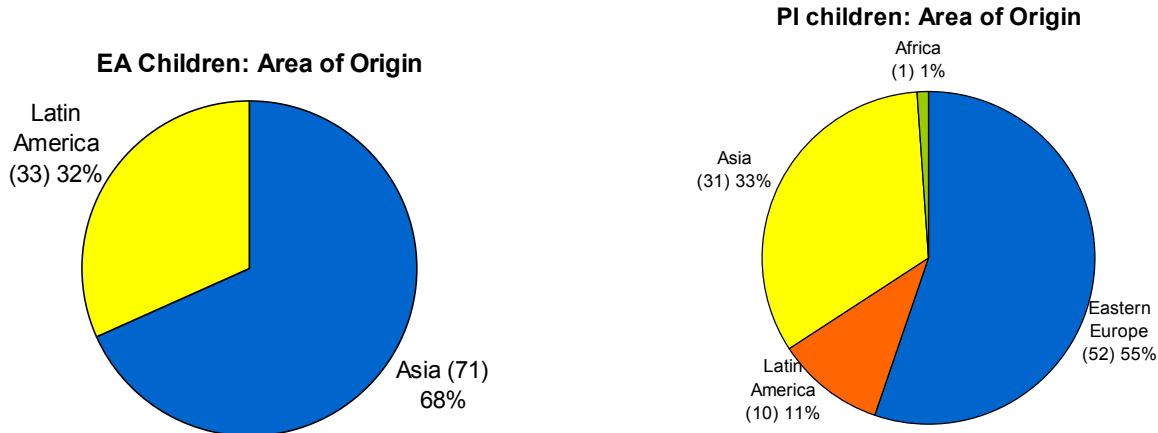
### Results from the Initial Profile Assessment:

The initial profile assessment is designed to help us assign children to the appropriate study. All children who participate in this research project attend this initial visit. It contains a brief assessment of verbal and performance IQ, language comprehension, ability to follow directions, sensory integration, and a screening for Fetal Alcohol Syndrome (FAS).

Children in this study fit into one of three participant groups:

- Post-institutionalized (PI) children adopted over 12 months of age, having spent 75% of pre-adoptive life in an institution
- Early-adopted (EA) children adopted under 8 months of age, having spent 2 months or less in an institution
- Children born into their families in Minnesota (BC)

This research is being conducted at both the University of Minnesota and the University of Wisconsin. Thus far 240 children have participated in the initial visit at the Minnesota site: 94 from the PI group, 104 from the EA group, and 42 from the BC group.



### Fetal Alcohol Syndrome (FAS):

We take a picture of the face from several angles and count FAS features.

Children with a high number of FAS features are provided with a referral to a pediatric clinic for further assessment. Of the 94 PI children who have been seen thus far, 2 have been observed to have a high number of facial features of FAS. None of the EA children have been identified as needing further FAS assessment. However, these findings do not mean that other children have not been exposed to alcohol prenatally. The facial features associated with FAS are typically only present when children are exposed to alcohol in-utero during the period of development when facial features are formed.

Continued on next page

**Verbal and Performance IQ:**

We use 2 scales from the Wechsler Intelligence Scale for children to estimate full scale IQ. If a child scores below “normal” on one or both of the scales, we conduct a non-verbal IQ test called the Leiter. *About half of the children who score below normal using the standard IQ test actually have normal range IQs when we administer the Leiter.* As a results, only 9 of the 94 PI children (8%) that we’ve seen have IQ’s that fall below what is considered “normal”.

Although PI children primarily perform within the normal range, as a group they have slightly lower IQs than do EA and BC children, and they score lower on IQ tests the longer they were in institutions before adoption. However, while this may sound bleak, a closer examination of the scores reveals that PI children are actually more like children in the general population. The difference, actually, is in the IQs of EA and BC children. The mean IQ score of EAs is 117, while that of BCs is 125. While PI children have quite normal IQs, because they likely go to school and compare themselves to children from the same educational and income brackets as our BC (and EA) children, PI children might come to believe they aren’t as smart as other kids.

When we look closely at our IQ measures, we find that it is the vocabulary portion of the test that seems to be holding them back, at least when compared to the highly verbal children in the EA and BC groups. We examined children’s language abilities using two additional measures, a measure of verbal comprehension and a measure of their ability to follow verbal directions. PI children did have more trouble with these tasks, especially if they had lived in institutions for long periods of time before adoption.

These results suggest an important avenue for future research with internationally adopted children. We are working with faculty in Speech, Hearing and Language Science who conduct research on second language learners. Information about these language studies is described on page 4 of this newsletter.

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**Post-Institutionalized Children’s Cognitive Challenges Are Specific, Not General**

Being raised in an institution deprives children of stimulation that is needed for their cognitive and motor development. Consequently, when post-institutionalized (PI) children are adopted they often reach their families quite delayed in their development. However, adoption is a major intervention and within a year or so with their families, most PI children score within the normal range on IQ tests. Still, many PI children struggle in school. One of the goals of the International Adoption Project is to help identify the specific cognitive challenges faced by PI children. This information will be useful in developing interventions that target children’s specific cognitive needs.

One of our first studies has involved testing PI children on a series of cognitive tasks that cover tests of distractibility, complex control of attention, memory and motor coordination. The children who participated in this study are 8- and 9-years old and have been with their families for about 6.5 years. All of them were over 12 months old at adoption and had lived at least 75% of their pre-adoption lives in some kind of institution. We compared them to EA and BC children (see page 1 of this newsletter). When this study is completed, we will have seen 40 children in each of our groups. Right now we have information on 38 PI, 27 EA, and 29 BC children.

**Results Comparing EA and BC groups:** On every test the children completed, EA and BC children performed about the same. We saw no differences by birth country or by whether the children were closer 2 vs 8 months at adoption (the range for the EA group). **Continued on next page**

**Results Comparing PI and BC groups:** Overall we gave the children 16 different tests. PI children scored as well as birth children on half of them. In the domain of motor development, they had little difficulty with balance or with fine motor skills, although PI children were less careful than BC children to stay in the lines when they were drawing. One striking difference, though, was on tasks where they had to do different things with different sides of their bodies. To get a sense of this, stand putting your left foot forward and your right back and put your right arm forward and your left back. Now, switch! Your right foot and left arm should be forward and left foot and right arm should be back. Keep switching. This type of bilateral coordination seemed to be difficult for PI children.

In more cognitive domains, PI children did just as well as BC children on a very complicated task that requires thinking ahead and planning. And they did just as well on a match-to-sample task where they had to pay attention to minute differences between objects and find the one that was the same. Where they seemed to be having some difficulty were on tasks where they had to learn one rule for solving a problem and then when that rule no longer worked, shift and figure out a new rule. PI children tended to keep trying to solve the problem using the first rule they figured out. They also had some problems on working memory tasks. For example, on one of these working memory tasks they had to search in different boxes on the screen for hidden objects. The goal of the task was to find all the objects without searching in the same place twice. PI children made more errors on this task and took longer to find all the hidden objects. What is interesting about all of the tasks where PI children had more difficulty was that they relied on brain circuits in the prefrontal cortex. This gives us some guide in moving forward to get even more specific about the kinds of cognitive problems that are particularly difficult for children who started their lives living in orphanages or other institutions. We are designing and beginning to implement those studies, some of which are described in this newsletter.

**Interpreting these findings:** One thing that our findings tell us is that there is a great deal of variation among PI children in their thinking and reasoning. Even on the tasks where as a group PI children scored more poorly, some of the PI children scored just like BC (and EA) children. In each of these cases, this was more likely for children who had been adopted earlier and thus had spent less time in institutional care. But even among the PI children who had lived for more than two years in institutions before they were adopted, some were performing as well or better than our BC children. For example, on that working memory task where the children had to search in different boxes without returning to the same place twice, about 30% of the PI children adopted over 2 years of age did as well or better than the average BC child. Understanding the source of this amazing variability among PI children is one of the major questions that the IAP will work on addressing in the future. The other strong message from this study is that the cognitive and motor challenges of PI children are specific, not general. As a group, on many tasks PI children score as well as BC children (and remember the average IQ of our BC group is 125!). PI children's challenges seem to be on specific cognitive tasks. The more we can understand about the specific cognitive and motor challenges PI children face, the better information we can provide to parents and professionals who work with PI children, and hopefully, the more interventions can be designed to address the specific needs of these children.

## ***Perceived Discrimination as a Post-Adoption Risk Factor in International Adoption***

Richard M. Lee, Ph.D. and the Minnesota International Adoption Project Team

**Introduction.** Past psychological studies on children who were adopted internationally generally have focused on the role of pre-adoption adversity on the emotional and behavioral adjustment of adoptees. This line of research has been quite important in advancing our understanding of the resilience of children. However, such research often ignores or overlooks the possibility that the transracial experiences of adoptees, especially those who are considered ethnic and racial minorities in the United States, may play an important role in the development and adjustment of adoptees. In particular, experiences with discrimination and prejudice may be as important a risk variable as pre-adoption adversity.

**Hypothesis.** The purpose of this investigation was to examine perceived discrimination as a post-adoption risk factor on the behavioral development of children who were adopted internationally. Drawing upon risk and resilience research, I hypothesized that perceived discrimination would be positively associated with internalizing and externalizing problem behaviors, after controlling for pre-adoption risk factors. I also examined whether these associations would vary by age and transracial status. Specifically, I hypothesized that the adolescents (i.e., children over 10 years old) would be more vulnerable to the effects of discrimination. Similarly, I hypothesized that children adopted from Asia and Latin America, as compared to children adopted from Europe/Russia, would be more vulnerable to the effects of discrimination.

**Data.** To test this set of hypotheses, I utilized the epidemiological data from the Minnesota International Adoption Project (MN-IAP). I specifically drew upon data from the cultural and adoption experiences section that measured the cultural experiences of children as reported by adoptive parents. We measured pre-adoption risk by creating an aggregate score based on the child's age at adoption, length of institution care, and health status. We measured perceived discrimination using the questions "How often do the following people [strangers, family members, teachers, your child's peers, co-workers, friends, and neighbors] make inappropriate or intrusive racial comments concerning your child and/or family?" We measured problem behaviors using the CBCL which assesses internalizing and externalizing problem behaviors (e.g., depressive and anxiety symptoms vs. acting out behaviors).

**Sample.** The study participants were school-aged children, ages 5 to 18 years old, which resulted in a final sample size of 1,589 children. There were more girls (N=950; 60%) than boys (N=639; 40%) and more than half the children were adopted from Asia (N=863; 54%), followed by Latin America (N=469; 29.5%) and Europe/Russia (N=247; 15.5%). Ten children were adopted from other world regions (e.g., Africa). The average age of the children was 9.61 (SD = 2.71) with a range between 5.24 and 18.84 years old.

**Results.** As expected, pre-adoption risk was significantly related to problem behaviors for most groups of international adoptees with generally a stronger effect on externalizing problem behaviors. As hypothesized, discrimination was significantly related to internalizing and externalizing problem behaviors, above and beyond the effects of pre-adoption risk, for children adopted from Latin America and Asia with the exception of 5-9 year olds from Latin America. These post-adoption effects also were greater for adolescent children from Latin America (in comparison with their younger peers).

**Conclusion.** Overall, the study results support the hypothesis that perceived discrimination is a relevant post-adoption risk factor. In this instance, we found that discrimination is as important to children's behavioral development as pre-adoption risk. Such research highlights the need for adoptive families to be sensitive to the ethnic and racial experiences of international adopted children, particularly those who are considered ethnic and racial minorities in the United States.

In the Fall of 2006, we plan to initiate a survey study involving adoptive families with Korean children (ages 5-18 years old) to better understand the role of culture in development and well-being. We will solicit both parents and adolescent children to participate. An invitation letter will be sent shortly to encourage families to take part. If you have an interest or would like more information, please contact Richard M. Lee, Ph.D. at 612-625-6357 or richlee@umn.edu.

## **Language and International Adoption**

Through our conversations with our parent advisory board and with parents who have participated in our research, we've learned that language is an area of particular concern to parents who have adopted internationally. We are working towards expanding our research focus to include more studies in this area. The following are two studies currently underway exploring language in internationally adopted children.

### **Assessing Language Outcomes in Internationally Adopted Children**

Your family may be one of the nearly 2300 families who completed a comprehensive survey of their internationally adopted children's development several years ago. During the past several months, Dr. Joann Benigno, Dr. Megan Gunnar, Dr. Jennifer Windsor, and Erika Hoyt have begun to re-analyze portions of the survey data to determine the overall rates of language impairments among internationally adopted children as well as characteristics and risk factors that contributed to IA children's language outcomes. Based on initial analyses, we found that the rates of language impairments among IA children in 1<sup>st</sup>-8<sup>th</sup> grade at the time of the survey were relatively similar to those found in U.S. birth children for children who did not have any significant neurological or cognitive impairment. Next, we divided the children into three groups (based on parental report of educational services received): (1) children with special service needs, (2) gifted and talented children, and (3) typically developing. The factors that mattered most were duration of institutionalization and attentional difficulties. Children receiving special services for their language or learning disabilities had greater attention difficulties and spent longer times in an institutionalized setting. In contrast, children who were in the gifted and talented group had less attention difficulties and spent less time in an institutionalized setting. Further analyses are still in the works and will be complete by the next newsletter! Stay tuned.

### **Language and Memory Abilities of Internationally Adopted Children**

Since Spring 2006, Dr. Joann Benigno, Dr. Megan Gunnar, Clare Faulhaber, Erika Hoyt, and Dr. Jennifer Windsor have been conducting a study to examine the language and memory abilities of internationally adopted children. First, thank you to all of the families who have participated in the project or expressed interest in participating. At this point, we do not have any results to report as we are still looking for more families to participate. If you have a child internationally adopted before age 3 who is currently between the ages of 8-12 and you are interested in learning more about the study, please contact Dr. Joann Benigno and her associates at 612-624-0321 or [benig002@umn.edu](mailto:benig002@umn.edu). Families will be compensated for their participation.

## Stress Response to Public Speaking

Over a hundred children have participated in this study which looks at children's physiological stress reactions to a social challenge, public speaking. Thank you to all of the families who have participated in this study!

In this study children are asked to wear four heart rate sensors while watching videos and preparing a speech. Children are then asked to present the speech in front of two unfamiliar adults and also complete some math problems aloud. Throughout the session, children are asked to provide saliva (spit) samples. Saliva is used to look at the reactivity of the stress hormone cortisol. Cardiac data is used to look at reactivity in two branches of the nervous system which are active in the stress response system, the sympathetic and parasympathetic. The sympathetic system controls the body's fight or flight responses, while the parasympathetic system is responsible for restoration and conservation.

This study is not yet finished, but preliminary results suggest differences in the way the post-institutionalized group is responding to the public speaking task. Compared with the other two groups, PI children showed the greatest sympathetic activation to the stressor and the least reduction in sympathetic activity following the stressor. Both PI and EA children showed higher parasympathetic reactivity to the challenge than BC children. We are hoping to have this study completed by the end of the year, and will report results from the full sample in next year's newsletter.

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## Early Social Communication Study

The Early Social Communication Study is a longitudinal study of the development of nonverbal social communication, language, and attachment in relation to patterns of brain activity in internationally adopted children. The study includes children internationally adopted from orphanages, children internationally adopted from foster care, and a comparison group of birth children born in Minnesota. Children participated in a laboratory visit at age 18 months, their parents are asked to complete questionnaires and a telephone interview at two and a half years, and families are invited back for a laboratory visit at age three years. We are nearing the completion of the two and a half year assessment and will also be done with the three year laboratory visits by the middle of next year. As we are still in the process of collecting this data, we have not yet done analyses with data from these ages. However, we are pleased to be able to provide analyses from the 18 month assessment.

We found that at 18 months, internationally adopted children were quite similar to birth children in terms of their nonverbal social communication. These skills include things like reaching for objects and making eye contact. However, post-institutionalized, internationally-adopted children were less likely to point to an object for the purpose of bringing someone else's attention to that object and less likely to share the experience of looking at objects with the experimenter.

Internationally-adopted children were on target for their age in terms of nonverbal cognitive skills, such as completing puzzles or finding a toy hidden underneath a cloth.

We look forward to presenting more findings as we wrap up data collection over the next nine months. We appreciate your continued support of our research. Please let us know if you have any further questions.

Amanda Tarullo, (Graduate Student, taru0007@umn.edu 612-230-0058), Missy Chatham (Graduate Student, chat0058@umn.edu, 612-626-0353).



## Neuroendocrine Functions in Post-Institutionalized Children

Children from institutional care experience a range of physical (food, clothing, medical care) and social deprivation prior to adoption into the United States. We found in the previous studies that about 40% of internationally adopted children tend to be significantly short for age at the time of adoption. That short stature may be similar to that associated with psychosocial neglect. Most PI children grow rapidly after adoption, but some of these children continue to show growth impairment. Identification of children at risk for post-adoption growth is important for early intervention.

In collaboration with the Department of Pediatrics, International Adoption Clinic we launched a new research project to better understand these physical growth delays. In particular, we are examining whether stress hormones produced when children receive poor care before adoption might have altered the growth hormone system resulting in changes in how much growth hormone is produced. The children in our study are between 8 and 48 months at adoption. We also are investigating changes in nutrition and its association with physical growth.

Currently we are collecting information about children who have recently arrived in the US from Eastern European countries. More than 100 families have already come for their initial clinical research visit at the International Adoption Clinic at the University of Minnesota. This initial visit includes both physical assessment (physical growth measurements, growth hormone collection, and cortisol collection) and a developmental assessment. Parents are asked complete several questionnaires and to collect cortisol via saliva at one month and six months after their child's arrival into the US. Six months after adoption families come for a second clinical research visit. More than 80 families have also already been back for a second visit. We look forward to meeting more new families.

If you are planning to adopt from an Eastern European country and would like to participate or would just like to know more about this research project, please check the IAC website <http://www.med.umn.edu/peds/iac/clinic/eustudy.html> or contact Maria Kroupina by phone at (612) 624-6609 or by e-mail at [kroup003@umn.edu](mailto:kroup003@umn.edu).

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## On-going studies of Brain and Behavioral development

While some studies are drawing to a close, other studies in the brain and behavioral development grant are ongoing or just beginning. If you have a child who will be between 8 and 11 in the next two years, you may still be contacted about participating in this project.

### Attentional Control Study:

This first part of this study is similar to the children's game, red-light green-light. This game is based on how hard it is to "stop" doing something that you are all set to do it. When you are all set to "go" and you get a "no go" signal, a circuit in the front of the brain turns on. If it doesn't turn on strongly enough, it is almost impossible to stop yourself from "going" and you seem to have an "attention regulation problem". This part of the brain develops during childhood which is why very young children really do have problems when you tell them to "stop", but by school age children typically are pretty good at turning on the "no go" brain circuit. In our brain version of the game, children wear a cap (similar to a swim cap) with sensors that tell us the strength of the "no go" brain circuit. They play a game where they press a button every time they see a letter, except for the letter X. In the second part of this study, children will play a game where they see a series of arrows, and are instructed to only pay attention to the direction of the center arrow. This will test children's ability to pay selective attention to the middle arrow, while ignoring the directions of the other arrows in the sequence. In an effort to complete other studies in this grant, we have not tested many children in this study. We will continue to move forward with this project, and will update you on our progress next year.

**Emotion and attention regulation study:**

This study is based on the same principal as the attention control study, inhibiting the impulse to “go” when your brain is trained to go. Negative emotions can interfere with our ability to turn on the “no go” circuit. For this study, in addition to playing the game with letters, we also have the children play the game with faces: neutral, happy, sad or angry. In the emotion version of the game sometimes the children press to all the smiling faces, but not to the angry faces. Sometimes the game is played by pressing to neutral faces, but not sad faces, and so on. Some children adopted from orphanages seem to have attention problems. This study will tell us whether this is because of problems with the “no go” brain circuit. It will also tell us whether these problems are more likely when emotion circuits in the brain are also turned on at the same time. This study is being conducted primarily in Wisconsin, where 60 kids have already participated. The Minnesota IAP team has just begun recruiting children for this study. With both sites working on recruiting children, we hope to have this study completed by the end of the year.

**Facial Expression and Emotion Study:**

There are two parts to this study, both examine children’s responses to “threat”. In the first task (dot-probe computer task), children view pictures on a computer of actors portraying different emotional expressions. Immediately following the faces, a dot is presented on the computer screen and children respond by pushing a button to indicate the location of a dot (right or left side of the screen). Differences in reaction time will be examined to determine whether children pay attention differently to angry (threatening) faces compared to non-threatening happy faces or neutral faces. The amygdala (emotion processing region) and medial frontal cortex (emotion regulation region) brain regions are involved in this task. In the second part of this study, children watch short video clips that elicit different types of emotions (positive, neutral and negative). Children wear sensors on their face to record their eye blink, or startle response to brief “blasts” of white noise presented through headphones during each type of video clip. We are measuring differences in children’s eye blink magnitude in response to these noises and expect them to be bigger during the negative video clips. This task also calls on the amygdala, which is the emotion processing region of the brain. This study is in the early stages of recruiting and we hope to have some results for you in next year’s newsletter.



# The International Adoption Project Fund

*An opportunity to support our work through your tax deductible contribution*

Since 2000, the University of Minnesota's International Adoption Project has been dedicated to providing answers and resources to families created through international adoption. Over the last five years, more than 3,800 parents have joined our registry an amazing response giving researchers opportunities to explore questions specific to families created through international adoption. We have been very successful obtaining grants to cover the cost of research on internationally adopted children.

Unfortunately, those grants do not cover the costs of maintaining the registry and sending out the newsletter. If you would like to support our efforts through your tax deductible donation please visit the foundation website at [https://www.foundation.umn.edu/pls/dmsn/online\\_giving.frames\\_broker?owner=IAP](https://www.foundation.umn.edu/pls/dmsn/online_giving.frames_broker?owner=IAP)

Any amount that you are willing to give is greatly appreciated. Because the University Foundation is overseeing this account, 100% of your donation will go directly to maintaining the registry and providing the newsletter and your contribution will be anonymous. We feel that providing this research information to families and adoption professionals is worth the cost, and we hope you feel the same. Thank you for considering supporting our work through your tax deductible contribution. If you have any further questions about this fund, please feel free to contact us at 612-624-9322 or by email at [iap@umn.edu](mailto:iap@umn.edu).

Thank you to all of you who contributed last year. We received almost \$800 in contributions, which was a tremendous help!