

UCI BROAD Lab

Biobehavioral Research on Adolescent Development

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Please email us at broadlab@uci.edu to update your info!

The Biobehavioral Research on Adolescent Development (BROAD) Lab is celebrating two years of recruitment here at the University of California, Irvine and CHOC Children's Hospital! We would like to say a big "THANK YOU" to all the teens and families who participated in our research, as well as all our community collaborators who helped spread the word! Without your help, this important research would not be possible!

The UCI BROAD Lab was established in 2017 and is a collaborative team of scientists, staff and students from multiple disciplines. Our primary goal is to learn more about adolescent development, behavior, mental and physical health, and to foster positive developmental trajectories as teens transition from adolescence to young adulthood. We anticipate that the findings from our research will help inform public policy and provide doctors and parents with additional tools and guidance to promote a positive future for their youth.

We are currently conducting three research studies; Brain Development, Eating Patterns and Activity, and Life Skills. All three studies are funded by grants from the National Institutes of Health (NIH). Each research study has a distinct focus and employs a variety of methods to identify the biological, psychological and social factors that contribute to positive versus negative trajectories in particular areas. For example, we conduct interviews with parents and youth and administer



problem-solving tasks to evaluate emotional/behavioral health, collect biological samples (including saliva, hair, and blood) to assess general physical health and stress levels, and obtain MRI scans to measure brain structure and function, and more!

In the following pages, we provide information about the purpose of each study, as well as some exciting preliminary results. We hope that you have enjoyed your participation and/or collaboration with us. We are very grateful for your contribution to science, and for helping future teens and families who would benefit from new treatments from this knowledge.

Brain Development Study Updates

This Study aims to learn more about how depression manifests differently in the brain depending on one's previous experiences. We are interested in identifying brain structural and functional differences in teens with depression *and* a history of abuse in childhood compared to teens with depression and no history of childhood abuse. The knowledge gained from this study will be helpful in developing more effective prevention programs for teens who may be at risk for developing depression or new treatment options for those who suffer from depression.

This study uses a "2 x 2 design" which means we recruit participants into four distinct study groups:

- **Group 1:** No depression; No history of abuse
- **Group 2:** Current depression; No history of abuse
- **Group 3:** History of abuse; No depression
- **Group 4:** History of abuse; Current depression

We began recruitment two years ago (in February 2018), and we will continue to recruit for at least the next 2 years. Our goal is to enroll a total of 240 adolescents, with approximately 60 teens in each of the four study groups described above. To date, we have enrolled 132 adolescents (96 females, 36 males) Participants complete 3 study visits. At Visit 1, teens and a parent or guardian complete interviews and questionnaires, and teens provide a blood sample by finger-prick. At Visit 2, the teens complete some problem-solving tasks on and off a computer, and at Visit 3, adolescents participate in a MRI scanning session to take pictures of their brain. During some of the scans, teens play computer games by pressing buttons when certain images appear on the screen. The MRI is able to "see" which parts of the brain are working the hardest or least on completing those games, which tells us how the brain is functioning.

Thanks to all the teens and families who participated in our study! If you know anyone who may be interested in participating, please ask them to call or text us at (949) 445-1232. You can also share the flyer in the next column, or direct them to our website at: <http://sites.uci.edu/broad/brain-development-study/>



UC Irvine and CHOC invite you to participate in the...

Brain Development Study

Lead Researcher: Dr. Uma Rao

- The purpose of this research is to learn more about brain development in teens with depression and/or a history of abuse.
- Your child may be eligible if s/he is 13-17 years old and:
 - May be suffering from depression

AND/OR

- Has a history of abuse prior to 10 years of age
- 3 visits to UCI or affiliate locations (7-11 hours total)
- You and your child will receive up to \$315 plus compensation for travel.

Call/Text: (949) 445-1232 | Email: BRoADLab@uci.edu



UCI BROAD Lab

Biobehavioral Research on Adolescent Development

UCI IRB Approved: 11-01-2018 | MOD# 24963 | HS# 2017-3440 1 of 1



Study Results

Teens participated in brain scans while looking at a series of faces with either fearful, calm, or happy expressions. We found interesting differences in the amygdala – part of the brain that responds to fear. For teens with depression *and* a history of abuse, their amygdala (**Figure 1**) was much more "active" when they saw fearful faces compared to teens with depression and *no* history of abuse. Their amygdala responded even to calm faces.



Figure 1

This type of "overactive" amygdala response may help us develop more refined treatments for individuals with adverse experiences in early life.

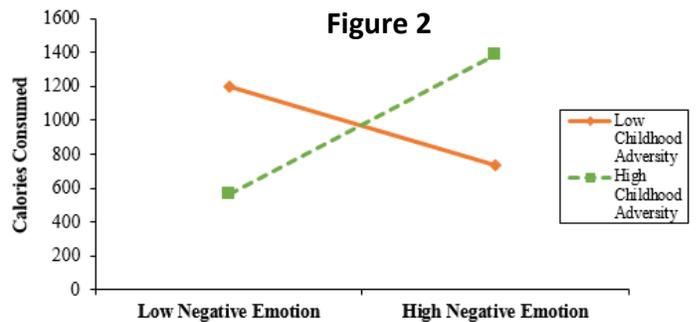
Eating Patterns & Activity Updates

This study aims to learn more about social and biological stress in relation to eating patterns and physical activity. There are 4 study visits. At Visit 1, parents and teens participate in some interviews, questionnaires and a discussion task. Teens also provide a few strands of hair and a blood sample by finger prick. At Visit 2, teens wear a watch-like device for 7 days, collect saliva samples for 2 days, and participate in phone interviews about their eating patterns. At either Visit 3 or Visit 4, teens participate in a blood draw and a scan to measure fat in different parts of the body. They have breakfast and relax for 2-3 hours watching pre-approved movies. They participate in a 15-minute task (relax in one visit and make a presentation in another visit), have lunch and go home.

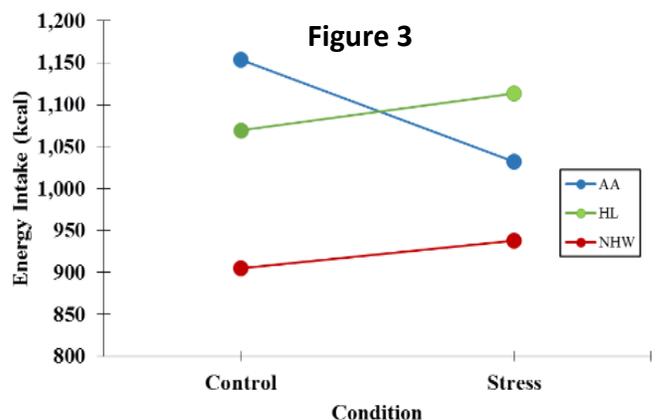
We plan to recruit 300 young women between ages 13 – 17 years, 100 in each of the three racial/ethnic groups: Black/African-American, Hispanic/Latina, and Caucasian/White. To date, we enrolled 130 youngsters (40 Black, 42 White and 48 Latina).

Study Results

Stress affects everyone differently. Our study found that teens who had more difficult experiences in childhood, like abuse or neglect, tend to eat more when they have negative feelings after experiencing a stressful situation. On the other hand, teenagers with low adversity in childhood show the opposite pattern: the worse they feel following a stressor, the less they eat (**Figure 2**). These findings suggest that protecting children from adverse experiences may also protect their health later, by reducing their risk for emotional eating and gaining weight which can cause many types of physical/mental problems.



In addition, we found that African-American (AA) teens ate less calories during lunch on the day they completed a stressful task compared to the day they watched a 15-minute nature video (**Figure 3**). There were no major changes in calories consumed by Hispanic (HL) and Caucasian (NHW) teens.



Thanks to everyone who recommended the study to family and friends! If you know anyone else who may be interested, please share the flyer on the left, or ask them to call/text us at (949) 445-6254, or email us at BRoADLab@uci.edu



UC IRVINE INVITES YOU TO PARTICIPATE IN THE...

EATING PATTERNS STUDY

Lead Researcher: Dr. Uma Rao, Department of Psychiatry & Human Behavior

- Help us learn how stress influences eating patterns and activity!
- Girls may be eligible if they are:
 - 13-17 years old
 - overweight
 - African American or Black, Hispanic or Latina, or Caucasian or White
- 3 visits to UCI or affiliate locations, plus some assessments completed at home (17-20 hours total)
- You and your child will receive up to \$430 plus travel compensation

Call/Text:
(949) 445-6254



BRoAD Lab
sites.uci.edu/BRoAD

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UCI IRB Approved: 11-25-19 | MDR# 29617 | HSP# 2017-3341 1 of 1

Life Skills Study Updates

This study seeks to understand brain changes in response to a family-based program, Pathways for African American Success (PAAS). PAAS is a 6-week program created for the benefit of Black/African-American youth to overcome challenges (e.g. racial discrimination, and peer pressure) and to promote communication between youth and parents for a shared goal of positive long-term outcomes.

Participants complete 4 study visits, plus the PAAS Program. At Visit 1, children and parents complete questionnaires about family communication, child behaviors, etc. At Visit 2, youth get a brain (MRI) scan. They are randomly selected (like a coin-flip) for the PAAS program or a waitlist group. After 6 weeks, youth get a second MRI scan (Visit 3). They take a 3-month break after which they complete another set of questionnaires (Visit 4). Once Visit 4 is completed, families in the waitlist group have the opportunity to participate in the PAAS program!

We plan to enroll 128 families. We have enrolled 94 families over two years. So far, 38 families completed the PAAS program and reported that they found the information helpful and that the computer-interactive sessions were enjoyable. Youth also expressed that they enjoyed the MRI scans and computer games!

Thanks to all the families who participated in our study! If you or anyone you know is interested in participating in the Life Skills Study, please share the flyer to the left, or call/text us at (949) 441-0271, or email us at BRoADLab@uci.edu. We are also excited to present a new video which will help children learn about what to expect at their MRI visits. To watch this video and read more about our study, please visit <http://sites.uci.edu/broad/life-skills-study/>.

Study Results

Youth participated in brain scans and were asked to play a betting game called the Wheel of Fortune. At baseline (before participating in the PAAS program), we saw differences between youth who bet more in "risky" situations (wheel showed possibility of losing a lot of points) compared to youth who did not take those chances (bet less often) (**Figure 4**). In high betters/risk-takers, the brain area that is related to reward-seeking wasn't "talking to" the brain region responsible for good decision-making and restraint as much as was seen in low betters/risk-avoiders.

This pattern of brain activity was also seen in youth who reported that they struggled with impulsive behavior. We will eventually know how the PAAS program can potentially change risky behaviors by helping these two parts of the brain to "talk to each other" in a more helpful way.



UC IRVINE INVITES YOU TO PARTICIPATE IN A...

FAMILY-CENTERED YOUTH PROGRAM

A RESEARCH STUDY DESIGNED FOR THE BENEFIT OF BLACK AND AFRICAN AMERICAN YOUTH!

- You and your child may be eligible to participate if you both identify as African American or Black and if your child is between the ages of 11 - 14 years
- You and your child will receive up to \$750 for your time and effort, plus compensation for travel
- 4 study visits at UCI or other affiliate locations and a 6-week computer program totaling 18-20 hours over 2-5 months
- The purpose of this study is to learn more about how a family-based program helps promote a positive future for youth by helping them make good decisions when faced with difficult situations. Dr. Uma Rao of the Department of Psychiatry and Human Behavior is the Lead Researcher.

Call/Text: (949) 441-0271 | Email: broadlab@uci.edu



UCI IRB Approved: 08-12-2019 | MOID# 26502 | HIR# 2017-3436

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