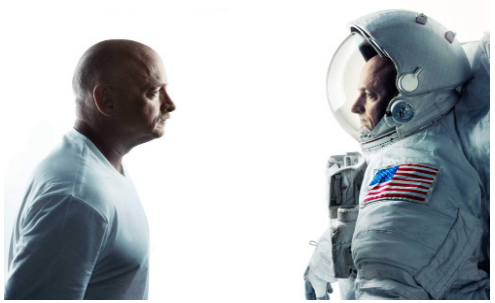
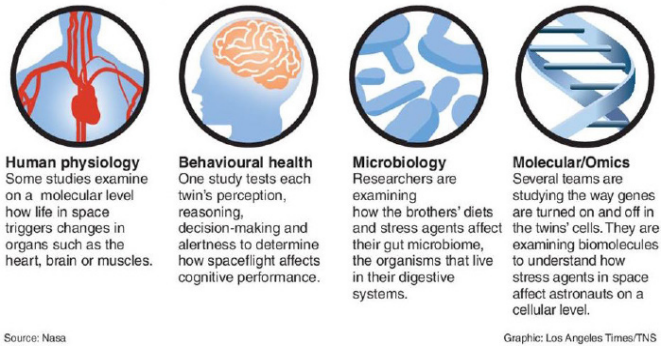
Twin Astronauts' Special Contributions to Science

This past March, astronaut Scott Kelly returned to Earth after a record 340 days on the International Space Station. Scott Kelly and his identical twin brother Mark Kelly are taking part in an ambitious research project that examines how living in space affects long-term health. The research topics span immune function, cancer risk, cardiovascular disease, and more.



Scott Kelly initiated the idea for the NASA Twin Study. NASA planned to track his health over the course of his mission. Scott asked if it would be possible to do a comparative study between himself and his twin. NASA jumped at the spectacular opportunity and invited researchers to submit proposals. There was an overwhelmingly positive response from the scientific community. Over 40 proposals were submitted and ten were selected. The combination of both astronaut experience and genetically identical twin status make this endeavor a truly unique scientific opportunity.

What's being studied?



Initial scientific publications are expected in 2017. This research will play a crucial role in preparing astronauts to Mars by the 2030s.

learn more: https://www.nasa.gov/twins-study

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Featured Articles:

Developing Emotion and Positive Affect
Elizabeth Planalp, PhD

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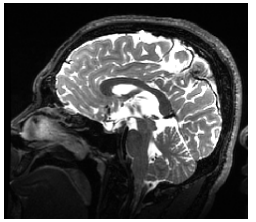

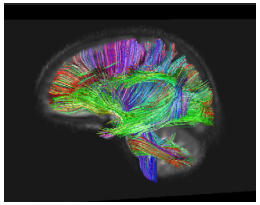

WAISMAN CENTER

DEPARTMENT OF Psychology

NIMH National Institute of Mental Health

WISCONSIN TWIN PROJECT
WTP

"Twins: two unique souls united by birth."
-- Unknown Author

Research Update

Dear twins and parents,

Our research project continues to make important progress as we publish from assessments conducted nearly twenty years ago. In the past year alone, more than twelve publications were generated from data we collected on twins and their families. A major theme in our research is the interplay of genetic and environmental influences on emotion (e.g., joy, fear, anger) and cognition (e.g., attention). Each publication underscores the importance of experience in explaining how individuals differ. In the coming year, we will relate our early childhood measures with information from recent interviews and neuroimaging sessions.

We hope to bring a total of 640 twins to UW-Madison before summer 2018. More than 270 twins have already attended an on-site neuroimaging visit; as more twins participate, we will build a stronger scientific narrative of adolescent development. For instance, some of our findings may generalize to all teens, others may be specific to boys or girls, and some findings may depend on the quality of family and peer relationships. To better understand adolescent development, we need to bring in a large group of twins to explore these important research questions.

As you can imagine, it is not easy to stay in contact with several hundred families. We appreciate your emails and phone calls with updated contact information. Our study coordinators schedule neuroimaging sessions on weekends and school breaks to accommodate schedules. Drop us a note if you received a voicemail or letter. We would love to catch up with more of you! Have a wonderful holiday season!

Sincerely,

Hill Goldsmith

Fun Facts

About 25 percent of identical twins develop facing each other, meaning they become reflections of one another. They may have birthmarks on opposite sides of the body, or have hair that swirls in opposite directions.

22% percent of twins are left handed, compared to 10% in singletons.

Nigeria has the highest rate of multiple births and more identical twins than any other countries.

Featured Results

Developing Emotion and Positive Affect
Elizabeth Planalp, Ph.D.

Emotion theorists identify fear, anger, sadness, joy, disgust and surprise as basic emotions. **In general, emotions can serve many functions: as tools for communication and also as adaptive mechanisms to motivate behavior and enhance survival**. J. B. Watson, the founder of behaviorism, viewed infant positivity as a sign of one of the innate emotions (love; Watson, 1930). Positive affect, though relatively understudied, is related to several positive outcomes throughout the life span; children higher in positive affect have more secure parent– child relationships, stronger peer relationships and prosocial behaviors, and better physiological regulation of emotions.

Positive affect is exhibited with expressions of laughter, smiling, positive motor behaviors and vocalizations. Though infants begin to smile reflexively in response to stimuli around three weeks of age, the first emotionally responsive *social* smile is not apparent until closer to two months of age; laughter appears around four months and more *social* laughter by 12 months of age. **From an evolutionary perspective, the social smile becomes an integral component of socio-emotional development, with infants and caregivers utilizing smiling as a tool to enhance attachment bonds.** Infants can exhibit positive affect as both a response to positive stimulation and also to make bids for caregivers' attention and elicit responsive and sensitive caregiving.

Twin studies comparing behaviors across identical and fraternal twins can detect genetic and environmental effects on positive affect by analyzing similarities and differences between the twin pairs. We examined how positive affect increased from 6 to 12 months of age and also what mechanisms were responsible for the development of positive affect. Our results indicated that positive affect at the age of 12 months, but not at six months, was related to parent affect and positive family environment. This pattern may indicate that infants learn over time to effectively engage with caregivers and elicit positive responses, or that infants learn affective expression from their caregiver's positive behaviors.

Featured Researcher

Douglas Dean III is a Research Fellow at the University of Wisconsin-Madison. He graduated with Ph.D. in Engineering at Brown University and moved to Madison in 2014, with a focus on infant brain imaging. His wife gave birth to fraternal twin boys in October 2016.

What was it like when you first heard you and your wife were expecting twins? My wife and I were initially shocked and overwhelmed. We just couldn't believe that we were going to have twins. However, these feelings quickly faded and we began to feel very excited about having two.

How has your life changed since arriving home from the hospital? I feel like things that we used to prioritize, like cleaning our house, we have let slip. Fortunately, we have had amazing support from family and friends.

What part about raising twins has surprised you the most thus far? For me, seeing how similar but different they are...I find it fascinating that we can already distinguish each of their behaviors at this early of an age.

Do you plan on scanning your twins using MRI? As an MRI physicist who studies early brain development and does infant imaging, I want to get the boys into the scanner as soon as possible! I've already begun to take steps to help make the scans successful when the time comes. For example, we play the same white noise when putting the boys to sleep at night that we use when scanning infants at the Waisman Center.

What do you hope to discover, or hope others will discover, about twins during your children's lifetimes? When the pediatrician assesses [twins'] growth…measurements are compared to growth charts that were developed using mostly singleton birth data. Even though my wife carried the boys for 38 weeks, they continue to fall within a lower percentile. I would think that it could be informative to develop growth charts for twins and examine whether [brain development] in twins differs from that of singletons.

Contact Info Request

Help us keep our records up to date. Please email or call us with your current telephone numbers and address.

☺ Enjoy the winter!

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