

## Twin Facts

- The city of Twinsburg, Ohio, was founded by a pair of identical twins in 1817. The city is now host to the annual Twins Days festival, which is one of the largest gatherings of twins and other multiples in the world.
- Around one third of twins are from opposite-sex twin pairs (a male and a female).
- Sisters Tashi and Nungshi Malik were the first twins to complete the Adventurer's Grand Slam, climbing the highest mountains on seven continents and reaching the North and South Poles.
- Taller women are more likely to have twins.
- Twins made up 10% of the births in the village of São Pedro, Brazil, over a four-year period, compared to less than 1% in the rest of the country and around 2% in the United States at this time! Researchers think a gene found in this population predisposes women to have twins.

## Introduction

Welcome to the 12<sup>th</sup> edition of the Michigan State University Twin Registry (MSUTR) Newsletter! This edition includes research findings from our studies, articles on twins raised apart and twins in space, and information about participating in our current twin studies.

First, we would like to share with you a few of the recent milestones reached by the MSUTR:

- Over 29,000 twins have now participated in a Michigan Twins Project (MTP) study, including over 4,750 twins who participated in the Children of Twins Project (COT).
- Over 80 families have participated in the Michigan Twin Neurogenetics Study.
- Over 800 twins have participated in the Hormones and Behavior across the Menstrual Cycle study.

This research would not be possible without the generosity of the twin participants, their parents, and the 170+ research assistants who dedicated over 75,000 hours of their time to the projects! Thank you for making our research possible and for making a difference in our quest to understand the origins of major medical, psychological, and social difficulties!

As always, feel free to contact us about anything in this newsletter or any of our studies.

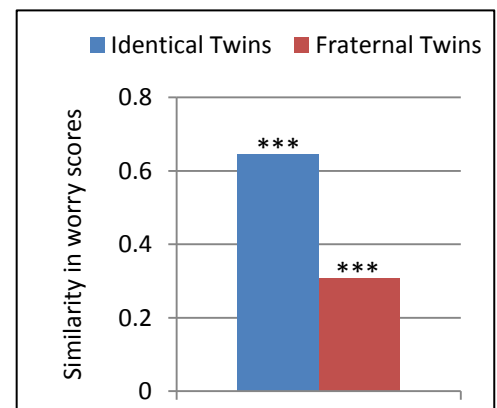
Sincerely,  
Drs. Alex Burt and Kelly Klump  
(Directors of the MSUTR)

## Research Findings from Our Studies!

Neuroticism and generalized anxiety disorder (GAD) are both characterized by excessive worry. Previous twin research has shown that neuroticism and GAD are both moderately heritable. However, to our knowledge, no study has examined the relationship between daily self-reported worry scores within identical and fraternal female twin pairs. Research using twins is particularly useful because we know that identical twins share 100% of their genes and fraternal twins share 50% of their genes, on average. This means that identical twins are likely to be more similar in traits with a genetic basis, such as neuroticism, compared to fraternal twins.

To explore this topic, we examined daily worry scores in a sample of 288 female twin pairs aged 15-25 years. We found that worry scores within twin pairs were highly related, with stronger relationships found between identical twins' scores than between fraternal twins' scores (see Figure 1). We then calculated the difference between each twin's average daily worry score within a twin pair and compared the average difference in scores between identical and fraternal twins. We found that fraternal twins differed more in their average daily worry scores compared to identical twins.

Notably, average daily worry scores were not significantly different between identical and fraternal twins (i.e., neither identical nor fraternal twins worried significantly more than the other twin type, on average). These data suggest that, similar to neuroticism and GAD, there may be a genetic component to worry. However, further research is needed to truly tease apart the different genetic and environmental influences on worry. Moving forward, we hope to continue investigating worry and other characteristics using data from the MSUTR.



**Figure 1.** The associations within identical and fraternal twin pairs for average daily worry scores. \*\*\*  $p < 0.001$ .

"Twin Facts" sources:

<http://www.twinsdays.org>, <http://sites.la.utexas.edu/twinproject/facts-and-figures>, <https://globalsportsmentoring.org/global-sports-mentor-program/emerging-leaders/tashi-and-nungshi-malik> [http://www.huffingtonpost.com/2014/03/24/twin-facts\\_n\\_4959012.html](http://www.huffingtonpost.com/2014/03/24/twin-facts_n_4959012.html), <http://www.nytimes.com/2011/03/25/world/americas/25brazil.html>

# Twins Apart and Together

While twins are commonly raised together, there have been numerous instances of twins brought up in different homes, at times in different cities or even different countries. In many of these cases, the twins grew up not knowing they were twins. However, for two twin pairs in Colombia, the surprise was not in finding out that they were twins, but rather that their twins were not who they thought they were.

The New York Times Magazine article “The Mixed-Up Brothers of Bogotá” tells the story of brothers William and Wilber, Jorge and Carlos, each pair raised as fraternal twins in different parts of the country. Due to a hospital error, the brothers were switched at birth and actually formed two separate twin pairs: William and Jorge, Wilber and Carlos. After their reunion at age 25, the twins were struck by their similarities, including shared behaviors, traits, and physical attributes, but they also struggled with feelings of confusion and loss. While they have been eager to get to know their biological brothers, they each hold in common a love for the “brothers” they grew up with and with whom they had shared their lives. Over time, the four have become close, as they spend time together, celebrate milestones, and discuss moving in together.

Dominus, S. (2015, July 12). The Mixed-Up Brothers of Bogotá. *The New York Times Magazine*. Retrieved from <https://www.nytimes.com/2015/07/12/magazine/the-mixed-up-brothers-of-bogota.html>



Street scene in Bogotá, Colombia

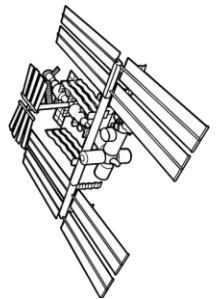
## Twins in Space



Twin studies have provided a wealth of information on the roles played by genetics and the environment in the development of a number of medical conditions, aptitudes, and behaviors. Recent research has extended this pursuit to outer space. Identical twins Scott Kelly, an astronaut with NASA, and Mark Kelly, a former astronaut, took part in a study to help determine the impact of prolonged space travel on the human body. As part of this study, both brothers completed the same biological and cognitive assessments while Scott spent almost a year on the International Space Station and Mark stayed on Earth. Since they share the same genetic background, the results will be particularly helpful in determining the effect that life in a zero gravity environment and other space conditions may have on human health and performance. NASA scientists hope the information gained in this

study will inform future space travel and aid in further exploration, such as one day visiting Mars.

References: <https://www.nasa.gov/twins-study>, <https://www.theverge.com/2017/3/21/14805232/nasa-twin-study-astronauts-mark-scott-kelly-space-interview>



## Our Current Studies

**Study 1. Twin Study of Hormones and Behavior across the Menstrual Cycle:** This project investigates changes in hormones and behavior across the menstrual cycle in female twins ages 15-25. We are currently focusing our recruitment on twin pairs in which one or both co-twins are taking hormonal contraceptives. Participating twins are paid up to \$220 for completion of the study.

**Study 2. Michigan Twin Neurogenetics Study:** This study investigates brain and behavior development in twins ages 12-17 that have previously participated in The Twin Study of Behavioral and Emotional Development in Children (TBED-C). The study includes an MRI session and takes place at the University of Michigan. Participating families are paid up to \$375 for completion of the study.

**Study 3. MSU Learning Study:** This study investigates the relationship between personality, beliefs, cognitive ability, and emotions in twins ages 12-15. Participating families receive a \$120 Target gift card for completion of the study.

**Study 4. Michigan Twins Project & Children of Twins Project:** These related studies are focused on developing a registry of twins ages 3-55 born in Michigan. To participate, adult twins and parents of child twins complete a brief questionnaire that assesses family composition and health status. The questionnaire may be completed using our online system or via the mail. Participating twins/families are sent a gift card to thank them for their participation and are given the opportunity to be contacted about future twin studies.

If you are interested in Study 1, or know someone who is, please contact us at: [kumtwinstudy@gmail.com](mailto:kumtwinstudy@gmail.com) or call (517) 432-3665

If you are interested in Study 2 or Study 3, or know someone who is, please contact us at: [burlab@msu.edu](mailto:burlab@msu.edu) or call (517) 355-6875

If you are interested in Study 4, or know someone who is, please contact us at: [msutr@msu.edu](mailto:msutr@msu.edu) or call (517) 432-5604