

## Twin Facts

- Trained sniffer dogs can distinguish between identical twins by scent.
- Researchers in Italy discovered that twins can interact with each other as early as 14 weeks in the womb, and by the 18<sup>th</sup> week, twins were found to be more interested in each other than themselves.
- Consuming more dairy products gives women a better chance of having twins.
- Most polar bears give birth to twins.
- Twins have a greater chance of being left-handed.
- Fraternal twins have a one in 17 chance of having twins themselves.

## Introduction

Happy Holidays and welcome to the 13<sup>th</sup> edition of the Michigan State University Twin Registry (MSUTR) Newsletter! This edition includes research findings from our studies, an article about a shockingly similar twin pair, additional research findings that were made possible because of twins, 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 31,000 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 465 Twins have completed the MSU Learning Study, and 300 twins have completed the Michigan Twin Neurogenetics Study.
- Over 1,025 twins have participated in the Twin Study of 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 100+ research assistants who dedicated over 60,000 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. We wish you and your family well during this Holiday Season!

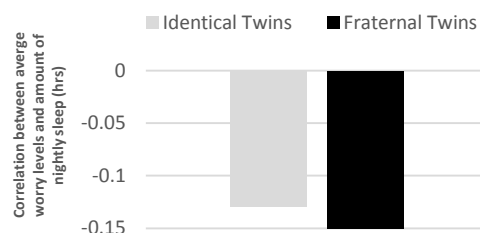
Sincerely,  
Drs. Alex Burt and Kelly Klump

## Research Findings from Our Studies!

Good sleep quality and an adequate amount of sleep have been associated with positive outcomes, such as better cognitive abilities and academic performance. However, high levels of worry can prevent these benefits. To our knowledge, no study has examined the relationship between daily self-reported worry scores and average amount of sleep and how this relationship might differ in identical and fraternal female twin pairs. Research using twins is particularly useful because we know that identical twins share 100% of their genes, while fraternal twins share, on average, 50% of their genes. This means that identical twins are likely to be more similar in traits with a genetic basis, such as worry, compared to fraternal twins.

We examined the relationship between average daily worry scores and average amount of sleep in identical versus fraternal female twins during late adolescence to early adulthood. To test this, we examined 616 female twins aged 15-25 years. We asked twins to rate how much they felt each of the following worry-related emotions: distressed, upset, scared, nervous, and afraid. Emotions were rated on a scale of 0-4, with 0 being *very slightly or not at all* and 4 being *extremely*. We also asked them how many hours they slept each night. The twins' average worry scores and average amount of sleep were then used for analyses.

We found that the more each twin worried, the less she slept, and the less she slept, the more she worried. However, there was no significant difference in either worry scores or amount of sleep between identical or fraternal twins (see Figure 1). This suggests that while the genetic component of worry on sleep may not be that strong, there are adverse effects of high levels of worry on amount of sleep, and vice versa. Given that previous studies show high levels of worry and poor sleep quality are associated with difficulty concentrating and poorer cognitive abilities, high levels of worry and poor sleep habits may have negative effects on important outcomes, such as academic performance. However, more studies are needed to truly tease apart these effects.



**Fig. 1** The associations for average daily worry scores and average amount of sleep per night within identical and fraternal twin pairs.

# Research Discoveries – All Thanks to Twins!

Twins have been instrumental in many modern research discoveries. The following research comes from some of the 230 twin studies conducted at the University of Melbourne. *Twins Research Australia*, managed by John Hopper, is one of the largest volunteer twin registries in the world with a database of 35,000 twin pairs!

- 1.) **Breast cancer gene:** Thanks to twin studies, researchers have discovered the first gene (LSP1) associated with breast cancer risk! Genetic factors play a large role in one's mammographic density, which influences future risk for breast cancer.
- 2.) **Inheritance for Epilepsy:** In the past, epilepsy was thought to be caused by head injuries or issues during birth, but twin studies have revealed a genetic component to certain forms of the disease. This helps us define and treat epilepsy.
- 3.) **Epigenetics:** By studying the epigenetic differences between identical and non-identical twins, the field of epigenetics is aiding in our understanding of the importance of one's environment on genes, particularly how factors such as diet and stress may be passed on to other generations.
- 4.) **Healthy brains:** Studying twins over 65 years old has enabled us to better understand how genes and lifestyle factors can impact cognitive abilities later in life. Twin studies show not only the significance of genetic risk on cognitive decline, but also the effect of lifestyle factors, such as exercise, diet and smoking.



May-Melbourne, C. (2017, November 10). We owe these 5 research discoveries to twins. Retrieved from <https://www.futurity.org/twins-nature-vs-nuture-1601572/>

## Meet the Jim Twins!



The case of the Jim Twins is one of the most interesting twin stories in history. James Lewis and James Springer were put up for adoption 3 weeks after being born. One was adopted by the Lewis family, the other by the Springers. From there, the two went on to live uncannily similar lives. First, they grew up 40 miles apart from each other in Ohio. Both were named James by their biological parents, but went by Jim. They each had childhood dogs named Toy. As adults, both brothers worked security related jobs. Jim Lewis was a security guard and Jim Springer was a deputy sheriff. Both twins married twice, the first time to women named Linda and the second to women named Betty. They each had one son, named James. They had similar habits as well. Both were heavy Salem cigarette smokers and were prone to nail biting. It wasn't until age 39 when both twins finally reunited and discovered how similar they were. They then took part in a study conducted by Dr. Thomas Bouchard of the University of Minnesota, which showed nearly identical medical histories and personalities. This story really does make you ponder the relationship between nature and nurture!

Source: <https://www.cbsnews.com/news/twin-brothers-separated-at-birth-reveal-striking-genetic-similarities/>, <https://www.ripleys.com/weird-news/jim-twins/>

## 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 15-30. 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 \$300 for completion of the study.

**Study 2. Hormones, Behavior and Brain Activity Across the Menstrual Cycle:** This study investigates systematic changes in ovarian hormones (e.g., estrogen and progesterone), behavior, and brain activity across the menstrual cycle in identical and fraternal female twins between the ages of 16-30 years. The aim of the study is to explore how mood and behavior may be influenced by the activation of neural systems during different phases of the menstrual cycle, and how these associations may be influenced by genes.

**Study 3. 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 4. MSU Learning Study:** This study investigates the relationship between personality, beliefs, cognitive ability, and emotions in twins ages 11-17. Participating families receive a \$100 Target gift card for completion of the study.

**Study 5. 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 2, or know someone who is, please contact us at:

[klumtwinstudy@gmail.com](mailto:klumtwinstudy@gmail.com)

or call (517) 432-3665

If you are interested in Study 3 or Study 4, or know someone who is, please contact us at:

[burtlab@msu.edu](mailto:burtlab@msu.edu) or call

(517) 355-6878

If you are interested in Study 5, or know someone who is, please contact us at:

[msutr@msu.edu](mailto:msutr@msu.edu) or call

(517) 432-5604