The co-twin control method is a research design that, when specific assumptions are met, allows psychologists to examine causality in human behavior. In psychology, we desire to understand the causal relations between traits, behaviors, environments, and genotypes but the rigorously controlled designs used in agriculture, physics, and chemistry are not (ethically) feasible with human participants. Instead, psychologists must rely on novel methods, such as the co-twin control method to infer causal relations without completely controlling the environments and genotypes of individuals.

Since identical (monozygotic, MZ) twins share all of their genetics and much of their environments (e.g., they have the same socioeconomic status in childhood, the same parents, etc) they are sometimes used as controls for one another. An example of this is when researchers are trying to determine the financial benefit or return of university attendance. If two people are identical at the end of high school and one attends university while the other goes straight to work, is there a difference in their earnings later in life? Co-twin control studies try to answer this question by examining identical twin pairs where one twin goes to university and the other does not, relying on the assumption that the twins in each pair are indistinguishable on all factors that affect later earnings before this divergence in life course. It is widely known that assuming MZ twins are identical copies of one another is not completely true, but Kevin Stanek’s study was the first to show how untenable it is, at least for this research question.

Twins from the Minnesota Twin Study who attended a four-year university (about 50% of all twins) and those who did not at age 20 differed in terms of critical personality traits, intelligence levels, and high school grades and these differences were significantly related to salary differences at age 29. Specifically, the personality traits of achievement, low aggression, low alienation, and high control (e.g., being organized and planful) predicted university attendance and higher income as an adult. Academic motivation and effort were related to university attendance and marginally related to adult income. Class standing/grade point average was the best predictor of university attendance and later income. Looking across all individuals in the study, the difference in annual income (before taxes) was about $7,000 at age 29.

*continued on page 3
Meet the staff: Psychophysiology Analysis

The Psychophysiology Analysis group is responsible for processing and analyzing psychophysiological data collected during laboratory sessions. They use technology to understand how the brain and body work together to process information. This includes measuring brain activity, heart rate, and other physiological responses. They also collaborate with other teams to integrate these findings with other research.

The Psychophysiology Analysis group consists of several researchers, including Assistant Professor Steve Malone and three graduate students. They work closely with other teams in the lab to ensure that the data is collected, cleaned, and analyzed properly.

In addition to looking at levels of brain activation, they also look at the relationships between regions of the brain. One way to do this is to compare data between two locations on the scalp, and for a given frequency of activation, look for similarities between the two signals in the timing of peaks and valleys to see if certain regions are “tuning” in synchrony. They can then illustrate the relationship between these areas as shown below as well as examine how these patterns relate to performance on the tasks and how they change with development.

These are just some of the exciting ways the psychophysiology group uses technology to dig deeper into the data.

With over 7000 participants coming through the psychophysiology lab at least once, doing multiple tasks, and many more at follow-up visits, there is a lot of data to process and analyze. It is very challenging work but the psychophysiology analysis group enjoys what they do very much. They would like to thank all of our participants who allow us to better understand how psychophysiology and behavior are related. We couldn’t do such interesting work without you!

Education and Twin Studies

However, most of this income discrepancy was related to pre-existing differences in grade point average, personality, and intelligence rather than university attendance itself. This finding is contrary to other studies of the returns to education (which find substantial positive returns) and even other twin studies so the team is continuing to collect the age 29 data (only about half of which was available when the study was carried out) to get a better estimate and understand of this difference. Additionally, it is important to bear in mind that university attendance itself. This finding is contrary to other studies of the returns to education (which find substantial positive returns) and even other twin studies so the team is continuing to collect the age 29 data (only about half of which was available when the study was carried out) to get a better estimate and understand of this difference. Additionally, it is important to bear in mind that university attendance itself.


Sibling Study update

We are very close to completing the second follow-up of the Sibling Interaction and Behavior Study (SIBS). We have had an amazing number of siblings participate in this follow-up! Of the 1220 possible participants, 1093 have already completed their phone interview assessment. Thanks to everyone who has participated in this study and we look forward to speaking to those of you who are left to complete this phone interview. We will soon be busy analyzing the data that we have gathered and look forward to learning more about influences on adolescent and young adult development.
Fun in the sun!
Pictures from the MCTFR summer picnic!

Thanks again to all our participants who make our work possible.