

they have found that caffeine use is unrelated to smoking or illicit drug use, perhaps for social and genetic reasons. Studies examining the choice of peer group show increasing genetic influence as the twins mature through adolescence and into young adulthood.

Environmental Influences on Depression, Anxiety, and Alcohol Use (DAD)

Dr. Kendler’s study about the environmental influences on depression, anxiety, and alcohol use is currently in the process of data entry. This step takes a number of months, and we always do entries twice to assure accuracy. Once data entry is complete, data analysis will begin. DAD will focus on assessing what roles life experience, personality, and cognitive style play in affecting vulnerability to depression, anxiety, and alcohol use. There are plans to contact some of the twins that participated in this study for a follow-up to discuss their willingness to participate in an informal discussion with Dr. Kendler and their co-twin. Dr. Kendler is interested in discussing the concept of “turning points” in key stages of their development. These discussions may result in the publication of a book or documentary in the future.

Did you know?

Here are some facts about identical, fraternal and half-identical twins:

IDENTICAL TWINS:

- Only one-third of all twins are identical.
- Contrary to popular belief, no genetic proof exists that identical twins “run in the family.” No hereditary influence for twinning has yet been identified.
- May have one shared placenta, two separate placentas, or two placentas fused into one.
- They share 100% of their genetic markers.
- Are always the same sex.
- Have the same blood type.
- Not caused by fertility treatments or maternal age.

-Can result in conjoined twins or mirror image twins. Mirror image twins are created when the fertilized egg splits quite late (around days 9-12); any later and twins can be conjoined.

FRATERNAL TWINS:

Can be hereditary on the mother’s side. The tendency to hyperovulate, or release more than one egg in a cycle, is a genetic trait that can be passed from mother to daughter.

- May have two separate placentas or two placentas fused into one.
- Share about 50% of their genetic markers, or the same as singleton siblings.
- May be same sex or male/female.
- May or may not have the same blood type.
- Can be attributed to fertility treatments or advanced maternal age.

HALF-IDENTICAL TWINS:

- It is not known what percentage of twins is half-identical.
- May have two separate placentas or two placentas fused into one.
- Share about 75% of their genetic markers, more than fraternal but less than identicals.
- May be same sex or male/female.
- May or may not have the same blood type.

The Science Corner

deoxyribonucleic acid (DNA) [dē-oks’ē-rī’bō-nū-klē’ik as’id]

defined: The chemical inside the nucleus of a cell that carries the genetic instructions for making living organisms.

double helix [dub’el hē’liks]




defined: The structural arrangement of DNA, which looks something like an immensely long ladder twisted into a helix, or coil. The sides of the “ladder” are formed by a backbone of sugar and phosphate molecules, and the “rungs” consist of nucleotide bases joined weakly in the middle by hydrogen bonds.


GENETICS TIMELINE: 1865

defined: Gregor Mendel Austrian biologist, born in 1822 and died in 1884, who laid the foundations for the science of genetics. Mendel was a monk whose controlled experiments with breeding peas in the monastery garden led him to conclude that the heritable units we now call genes were not blends of parental traits but separate physical entities passed individually in specific proportions from one generation to the next. Mendel’s discoveries were ignored for several decades, but other biologists finally recognized their significance early in the 20th century.





NIEHS
Environmental Autoimmunity Group



Recently Diagnosed with a Rheumatic Disease?

To understand the genetic and environmental factors related to these illnesses, NIEHS is seeking families in which an adult or child has been diagnosed within 4 years with Rheumatoid Arthritis/Juvenile Rheumatoid Arthritis, Systemic Lupus Erythematosus, Systemic Sclerosis or Dermatomyositis or Polymyositis. The researchers are attempting to answer the question why did one sibling develop disease while the other did not? These families need to have a twin or sibling of the same gender (who is within 4 years of age of the person with one of these diseases) and who does not have an autoimmune disease. Enrollment is at the NIH Clinical Center or in a local doctor’s office. The study includes a thorough evaluation and compensation is available. For more information call the MATR at 1-800-872-8946.

MOVING?

Make sure you keep us updated with new addresses and phone numbers by calling us at 1-800-URA-TWIN.

TWIN PHOTOS AND STORIES

We want to thank everyone who has sent in their photos or stories in the past! Please continue to send in your twin photographs or stories about experiences you and your twin have had. Once we receive them, we’ll ask you to sign a permission form that allows us to use them. If so, your picture and/or story could show up in upcoming newsletters or on our website! We know our twins enjoy learning about other twins’ unique experiences and we would love to share your story with others!


MULTIPLES DAY CANCELLED


The MATR would like to thank everyone who took part in the 11th Annual Multiples Day celebrations at Paramount’s Kings Dominion and the 2nd Annual Multiples Day at Paramount’s Carowinds. We enjoyed the opportunity to meet and talk with you. At this time, due to a decline in attendance, Multiples Day has been put on hiatus at both parks.

We will keep you updated on future plans for Multiples Day through MATR newsletters and our website.

What do you want to see in the next issue of *Twin Matters*?

We apologize for the delay in sending out the new issue of Twin Matters. We have been busy with new studies and working to bring you information that you will find useful and interesting. If there is a topic you would like to learn about in an upcoming newsletter let us know by visiting our website www.matr.vcu.edu or calling out 24-hour toll free message line, 1-800-URA-TWIN (1-800-872-8946).



MID-ATLANTIC *twin* REGISTRY

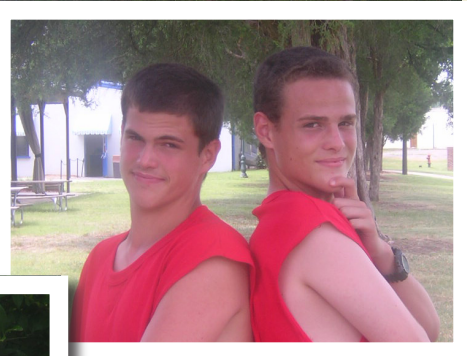

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Twin Matters

A Family Newsletter from the Mid-Atlantic Twin Registry

Volume XIII



In this Issue:

- About the MATR
- Research Updates
- Upcoming Studies
- ***NEW*** Science Corner



Virginia Commonwealth University

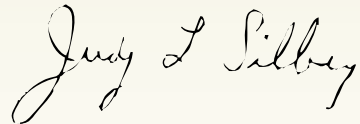
A Message From the Directors

Greetings from the Mid-Atlantic Twin Registry (MATR)! We are happy to inform you that the MATR is looking forward to a busy winter season with an exciting line-up of projects, both new and ongoing. We have been working closely with researchers and are eager to invite you and your families to participate!

Some of our projects will need twins from various states, so the MATR is making an effort to contact twins who may not have heard from us in quite some time. If this is the first newsletter you have received from us, you'll find some useful information about the MATR below, as well as information about how to contact us. For those of you who have been awaiting Twin Matters, we apologize for the delay and hope you'll find this latest edition informative and interesting.

As always, we are very grateful to the many twins and their family members who make our research possible. By taking part in health-related research, you play an essential role in scientists' efforts to understand, prevent, and treat a wide range of health and behavioral conditions. We would like to thank you for your support and participation, and we look forward to working with you!

With great appreciation,



Judy Silberg, PhD



Lindon Eaves, PhD

About the MATR

The Mid-Atlantic Twin Registry (MATR) is an organization of over 50,000 twins and multiples of all ages (infant, preschool, school age, and adult) and their families who are willing to consider taking part in health-related research. The MATR is located on the medical campus of Virginia Commonwealth University (formerly the Medical College of Virginia) in the state capital, Richmond, where researchers have been studying twins and their families for over 25 years. Directed by Associate Professor Dr. Judy Silberg and Distinguished Professor Dr. Lindon Eaves, the MATR is one of the leading programs of medical research in the world. Twins are important assets to research because they help scientists understand the relationship between the environment and heredity (genes), which improves the prevention, diagnosis, and treatment of common diseases and conditions. To learn more about the MATR please visit our website at www.matr.vcu.edu or call our 24-hour toll-free message line at 1-800-URA-TWIN (1-800-872-8946) for more information.

RESEARCH UPDATES



VTSABD

In 1992, Dr. Lindon Eaves and Dr. Judy Silberg began the Virginia Twin Study of Adolescent Behavior Development (VTSABD). With the help of over 2,800 female and male twins (8-17 years old) and their parents, the researchers tried to sort out the relative contributions of genes and the environment to problems like anxiety and depression, eating disorders, substance abuse, conduct disorder, and attention deficit hyperactivity disorder (ADHD). Results from this study highlighted the importance of hereditary factors in nearly all forms of problems in childhood and adolescence. In an effort to expand upon these findings, two more studies were initiated: one by Dr. Silberg, the Young Adult Follow-Up Study (YAFU), and another by Dr. Donna Miles, the Life Experiences Interview (LEI). Both of these studies will interview the same twins, now 25-35 years old, who participated in the VTSABD as children.

YAFU

Dr. Silberg began the Young Adult Follow-Up Study in August 1998. To date, over 2,200 participants have completed the interview. The YAFU study will try to find answers to some important questions such as:

- 1) What are the best childhood predictors for healthy functioning in young adulthood?
- 2) Who is the best person to ask about a child's behavior for predicting later outcomes—the parents, the child, and/or the teacher?
- 3) Is the expression of behavioral problems at different points in development due to a common set of genes?
- 4) Are there different genetic and environmental pathways to problems in young adulthood?
- 5) Are some people more genetically susceptible to the adverse effects of the environment on such conditions as depression?

LEI

LEI is a follow-up study conducted by Dr. Donna Miles, in conjunction with Drs. Eaves and Silberg. Participation by these same twins will allow the researchers to try and find out how problems and experiences in adolescence may contribute to the development of smoking, alcohol abuse, and other drug-use disorders in adulthood. Better understanding of risks and protective factors for substance abuse will help in developing more effective prevention efforts aimed at adolescents.

MRI

Drs. Kenneth Kendler and Carol Prescott, heads of the Stress and Coping Study, have previously conducted interviews with twins to understand the genetic and environmental factors that could lead to the development of common emotional problems.

Currently, Dr. Jack Hettema is taking this research to another level by applying new methods such as magnetic resonance screening (MRI) in order to examine directly the brain structure and function of these twins.

This study serves as a pilot for larger studies in the future and involves a select group of twins who participated in the previous Stress and Coping Study, Children of Twins, and Young Adult Follow-Up.

COT

Not only truly unique in its design, the Children of Twins Study is also one of the largest studies of its kind! Conducted by Dr. Judy Silberg, the Children of Twins Study focuses on which family factors contribute to the emotional and behavioral health of children.

The first phase of this two-phase study is the telephone survey, which began in 2002. So far over 2,500 twin families have participated! Thanks to the willingness of MATR twins to participate, nearly 85 percent of eligible twins who were invited to take part in the survey have completed the interview. This is quite an impressive participation rate! The second phase of this study began in 2004 and has since gathered invaluable data from nearly 600 twin families who have welcomed the COT interviewers into their homes. These families have contributed their valuable time in exchange for an in-home pizza dinner! In addition to these families, many twins have participated in a telephone version of the in-home interview. Totally, we expect to complete nearly 10,000 interviews either by phone or in the home!

What does the data show us?

The data collected from the phone surveys and in-home interviews have provided some unprecedented findings! The unique design of the study enables Dr. Silberg and her staff to attempt to determine the genetic and environmental causes for both healthy childhood behavior as well as common behavioral problems.

Dr. Silberg will use this data to answer questions such as:

- Are divorces always bad for children?
- Is it worse to be too lenient or too strict?
- Does it really matter if I go back to work when my children are school age?

So far we are finding that many parental behaviors we measure tend to predict certain behaviors in their children. For example, we are finding that maternal warmth towards a child lends itself to well-adjusted children. Conversely, parents who are often depressed tend to have children who “act out” more and are unhappy. Interestingly, these associations appear to be environmentally mediated and not as much accounted for by genes shared between

parents and their children. The story is a bit different for “hyperactive” behavior in children which appears to be derived more from genetic inheritance.

More information needs to be collected to answer statistically questions like these, so the COT staff is hard at work interviewing and collecting data in both phases of the study. Special thanks to all the families and twins who have participated in the COT study so far. Your contributions make this study more valuable and increase our knowledge of the impact parents have on their children.

DNA COLLECTION METHODS

The MATR, along with the Virginia Institute for Psychological and Behavioral Genetics, has launched research efforts to determine the best method for collection of DNA. Two options for DNA collection, blood or saliva, were piloted in recent MATR studies conducted by Drs. Kenneth Kendler, Lindon Eaves, and Timothy York. Recent scientific advances have made saliva a safe and efficient collection method for DNA analyses, which presents less of a burden to our participants. The saliva is collected by a packet sent through the mail, so it's convenient to use! Many thanks to all the participants in these studies!

DISEASE RISK FACTORS FOR TOBACCO USE IN TWINS

Researchers at VCU, Drs. Timothy York and Lindon Eaves, are using high-throughput genomic technology (a new field of bio-information which requires the aid of high-speed computers) to measure the products of thousands of genes in an effort to identify risk factors for tobacco-related disease. Over the past year, blood has been collected from twins where one twin in the pair is exposed to tobacco and the other is not. The non-smoking twin serves as a genetically-matched control useful for tracking differences in gene products that may arise due to tobacco exposure. Collecting this information from twins is important since it allows researchers to determine the extent that an individual's genes may control this response.

This study is unique for the MATR since it is the first time blood has been collected from twins. In the pilot-project phase of the study, blood from a total of 18 identical and 5 fraternal twin pairs have been collected. Gene products, in this case “messenger RNA” that eventually will be used to create proteins, are isolated from blood cells. This material is then measured using microarray technology (see the Science Corner) which is capable of measuring the activity of thousands of genes simultaneously. A tremendous amount of information can be generated from a simple blood donation of about two tablespoons. Knowing whether a gene is “expressed” at a different level between smokers and non-smokers is one step closer to understanding how tobacco-related disease develops.

MM3

Dr. Kenneth Kendler and colleagues are currently completing intensive data analyses for this third wave of interviews with the adult male-male twin pairs who have been part of the Stress and Coping Study since 1994. The major goal of this study is to figure out how genes and environment influence vulnerability to drug use and drug-related problems as we grow and mature. The focus of this study is to learn what contributes to the decision to use or not use psychoactive substances. So far, findings suggest there may be evidence that genes play a larger role in shaping their environment as men age. Additionally,

UPCOMING STUDIES

The MATR's fall/winter is packed with new studies, and we just might be inviting you to take part! For your information, here are brief descriptions of what we have in store:

Sleep Study: Researchers at the University of Pennsylvania in Philadelphia are studying a phenomenon known as “sleep homeostasis,” which is basically the drive to fall asleep. They are looking for MZ and DZ same-sex twin pairs to complete a series of tests, including an overnight stay in their sleep center. This study is underway and we are looking for twins who are willing to take part. If you are interested in participating in a brief interview to see if you qualify, please call us at 1-800-872-8946 and leave a message.

Polycystic Ovary Syndrome: We are just now starting up the second phase of a study on Polycystic Ovary Syndrome (PCOS), conducted by researchers at the National Institute of Environmental Health Sciences and Duke University. The researchers are interested in learning more about this syndrome, and they hope that the data they collect will help women who have this condition.

Factors in Human Aging: Conducted by Dr. Colleen Jackson-Cook of Virginia Commonwealth University, this study plans to collect DNA from willing twins and to look for factors which effect human aging. In order to do so, they will invite twins ranging from 6 to 80 years of age to provide their DNA. The DNA will be compared to determine how changes impact aging, possibly enabling researchers to determine how to slow the aging process.