Updates on MATR Twin Research

Continued from inside

never been depressed, and vice-versa—those with drinking problems were more likely to become depressed; 2) identical twins were more similar (concordant) for depression, for alcohol problems, and for their overlap than were fraternal twins; and 3) if one twin had been depressed, the other twin was more likely to have alcohol problems (compared to twins whose co-twins never had depression or drinking problems). This last result was true only for same-sex twin pairs. Among brother-sister twin pairs, women whose twin brother had a drinking problem did not have increased rates of depression. Likewise, twin brothers of women with depression did not have higher rates of alcohol problems.

Taken together, these results suggest three things. First, some genetic and environmental factors influence only depression and some influence only alcohol problems. Second, other genetic and environmental factors contribute to the overlap of depression and alcohol problems. Third, these overlapping factors are not the same for men and women. This last result is inconsistent with the prevailing theory that the genetic basis for depression and alcohol is the same. This finding suggests that the basis for depression in women is not the same as the basis for alcohol problems in men.

New Collaboration with Brain Researchers at NIMH. Researchers at VCU have forged a new collaboration with scientists at the National Institute of Mental Health (NIMH) who are conducting a study of developmental changes in twins' brain structure. The NIMH researchers are using magnetic resonance imaging ("MRI") to explore the effects of genes and environment on brain development. MRI provides detailed images of the brain without the use of radiation. Preliminary studies show that certain brain structures are highly influenced by genes, whereas others are more susceptible to environmental differences. By collecting measures of memory, attention, and verbal abilities along with the MRI scans, scientists hope to learn more about the relationship between brain form and function. Scientists are studying both healthy pairs of twins and pairs in which one twin has a behavioral disorder. The researchers hope to determine whether genetic influences on brain structure could influence the development of Attention Deficit Hyperactivity Disorder (ADHD), anxiety, or depression.

New Mathematical Tools Help Researchers Understand Development. Some of VCU's researchers who work with the MATR spend a lot of their time trying to provide the mathematical tools necessary to help understand how genes and the environment influence complex human traits. These tools are computer software applications that help scientists design better and more cost-effective studies, or enable them to analyze data utilizing powerful methods. For example, researchers at VCU are trying to develop better ways to sort through very large sets of genetic data to find the various genes that may influence risk for a complex disorder. One statistical tool helps researchers who analyze data collected during long-term studies. These researchers use this tool when looking at data collected from the same people over a period of years, during which time significant changes may occur in the ways that genes and the environment influence outcomes.

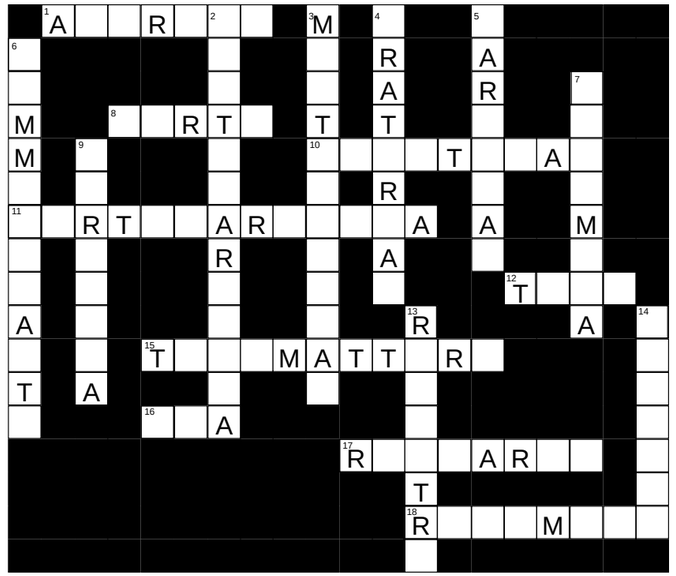
Answer Key

Across 1. Address 8. Forty 10. Identical 11. North Carolina 12. TWIN 15. Twin Matters 16. DNA 17. Research 18. Richmond

Down 2. South Carolina 3. Multiples Day 4. Fraternal 5. Cardinal 6. Commonwealth 7. Columbia 9. Virginia 13. Registry 14. Dogwood

Kids' Corner

Here's a fun crossword puzzle that's all about twins, the MATR, and the states of Virginia, North Carolina, and South Carolina. Most of the answers can be found in this newsletter. To give you a head start, we've put every M, A, T, and R into the puzzle already. If you're really stumped, an answer key is printed on the opposite page.



Across

1. To keep in touch with you by mail, the MATR always needs to have your current …
8. The MATR includes approximately _____ thousand twin pairs.
10. Monozygotic twins are commonly called _____ twins.
11. Raleigh is the capital of…
12. The MATR's toll-free telephone number is 1-800-URA …
15. Title of the MATR newsletter
16. Deoxyribonucleic acid is also known as…
17. MATR participants take part in scientific…
18. Capital of Virginia, and the MATR's hometown

Down

2. Nicknamed "The Palmetto State"
3. Takes place at Paramount's King's Dominion every year on the fourth Saturday of July.
4. Dizygotic twins are also known as _____ twins.
5. State bird of both Virginia and North Carolina
6. The MATR is located at Virginia _____ University.
7. The capital of South Carolina
9. MATR state known as "The Old Dominion"
13. The 'R' in MATR stands for…
14. State flower of both Virginia and North Carolina

VCU Mid-Atlantic Twin Registry MATR

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Twin Matters

A Family Newsletter from the Mid-Atlantic Twin Registry Volume V

In this Issue:

- Updates on MATR Twin Research
- Privacy Policy
- Kids' Corner

Upcoming Issues:

- Study Updates/Research Findings
- Twin Stories

A Message From the Directors

With nearly 40,000 twin pairs and their families registered, the MATR continues to grow. As the MATR has grown, so has the need to have a staff member available to answer any questions participants may have. In response to this need, we are pleased to announce the addition of a new Participant Coordinator, Tim McCready, to the MATR staff. An honors graduate of Virginia Commonwealth University, Tim holds a bachelor's degree in psychology. He has three years of research experience that includes conducting interviews and focus groups, as well as study of specific behavioral issues. If you have any questions about the MATR, please contact Tim by calling 1-800-URA-TWIN or sending an email to twinreg@hsc.vcu.edu.

In other news, the MATR recently finalized its official privacy policy. This policy details the specific precautions taken to protect the confidentiality of all MATR participants' personal information. The privacy policy explains how we collect, use, and safeguard personal information. The MATR developed this policy in part to respond to society's increasing emphasis on privacy and confidentiality. The privacy policy can be found in its entirety on the MATR web site (http://views.vcu.edu/~twinreg/). If you would like to receive a copy of the privacy policy in the mail, write to us at the address on the back page of this newsletter, and we'll be happy to send you a copy.

Once again, we would like to extend our warm gratitude to all of the Mid-Atlantic Twin Registry's participants. By participating in the MATR, you play an essential role in helping scientists to understand a wide array of health-related issues. We hope that you enjoy participating in the MATR, and we thank you for taking part in research which has the betterment of society as its ultimate goal.

Sincerely,

Lenn Murrelle, MSPH, PhD Linda Corey, PhD

Multiples' Day

The fifth annual "Multiples' Day" at King's Dominion was great fun. Approximately 1,000 twins from Virginia, North Carolina, Pennsylvania, Maryland, South Carolina, and elsewhere had a blast on July 22nd as they explored the park, rode the rides, and met their fellow twins. Members of the MATR staff were on hand at the event's special lunch pavilion to meet MATR participants and distribute MATR magnets, key chains, and newsletters. Since we rarely get to meet "our" twin families, it was a great pleasure to see and talk to so many of you. Plans are already underway for next year's "Multiples' Day," (the fourth Saturday in July), so look for information about tickets in the Spring 2001 issue of *Twin Matters*.

Wanted: Twin Stories and Pictures

We are very grateful for the many wonderful twin stories and photographs you've sent us over the years, and we hope you've enjoyed those that have appeared in *Twin Matters* and on our web site. We are always very happy to receive twin pictures and stories in the mail – if you have any that you'd like to share, please send them to us. With your permission, we may use your twin stories and pictures in our publications and on the MATR web site. To get to the Twin stories and photos on the web, direct your browser to *http://views.vcu.edu/~twinreg/*. Click on "Stories and Photos." For twin photos, click on the link for "Twin Photo Album." To advance through the album, just click the "next" button in the bottom right-hand corner of each page.

Updates on MATR Twin Research

Cardiovascular Twin Study. Between 1983 and 1993, many adolescent twins took part in the MCV Cardiovascular Twin Study, conducted by Dr. Richard Schieken of VCU's Department of Pediatric Cardiology. The study focused on the roles of genes and the environment on risk factors for hypertension (high blood pressure). In 1998, the researchers received funding from the National Heart, Lung and Blood Institute to continue analyzing the data from this study. The purpose of the current project is to answer the following questions: How do genes and the environment influence the relationship between obesity and hypertension, and are these genetic and environmental factors the same for males and females from childhood through adolescence into adulthood, or do they change as a person gets older?

To date, the study has yielded several findings. Researchers measured twins' heart rate and blood pressure under three different conditions: while at rest, during a physical exercise known as handgrip, and while conducting mental arithmetic. The researchers found that genetic factors seemed to account for most of the variation in heart rate and blood pressure at rest and during physical and mental stress. These factors were not different for men and women and appeared to be stable as the study participants went from childhood into adolescence. The researchers also found that mostly the same genetic factors contributed to variation of heart rate and blood pressure both at rest and during stress. However, different genetic factors appeared to influence systolic blood pressure during handgrip only. (Systolic blood pressure is the top number of a blood pressure reading (for example, the '120' in 120/80). It indicates blood pressure during the heart's contractions). This finding suggests that molecular genetic studies in the future may identify one group of genes for resting blood pressure and a different group for the response of blood pressure to exercise. Finally, it was found that the response of heart rate and blood pressure during exercise on a bicycle differed by sex and race, with females having a higher heart rate than males and African Americans having higher blood pressure than Caucasians.

Since heart disease begins in childhood, it is important to have a better understanding of how cardiovascular risk develops and the factors that influence risk. Key to this understanding is the identification of specific environmental risk factors and at what ages they have their greatest influence. It will also be important to identify those people who are at greatest risk for developing heart disease and to enlist their help in looking for specific genetic factors that make such

people more vulnerable. These steps are vital for the prevention and treatment of cardiovascular disease.

Seizure Disorders. A study involving twins in Virginia and Norway which looked at the role of genetic factors in determining a person's risk for seizures found that identical twins were much more concordant for seizures than fraternal twins. "Concordance" is a term used to describe how much twins share a characteristic or condition. This finding suggests that genetic factors are important in determining the

type of seizures or epilepsy that a person may have, as well as whether or not a person will have seizures at all.

In a related study involving MATR twins from Virginia, researchers sought to understand status epilepticus (SE) and to estimate how common it is in a group of twins. SE is a condition in which people have seizures that last over 30 minutes. Out of 10,915 pairs, 365 twins were found to have a history of seizures. Of these, 67 had experienced at least one episode of SE. All twin pairs in which both twins had SE were identical. These results provide an estimate of the prevalence of SE in this group of twins, and offer further evidence for a genetic contribution to risk for the condition.

Anorexia and Depression. Anorexia nervosa is a debilitating illness recognized by extreme thinness, a desperate fear of gaining weight, dissatisfaction with one's body shape and size, and the loss of normal menstrual function in women. Anorexia nervosa can cause severe medical problems, including osteoporosis and cardiac failure. Of all mental illnesses, anorexia nervosa is the most deadly.

Until recently, most people have believed that anorexia nervosa is caused by our society's obsession with thinness. The belief was that young girls dieted to look more

like waifish magazine and television models and to be accepted by others and by themselves. This theory could never account for why only a small proportion of girls who dieted progressed to anorexia nervosa.

Information from the female twins who participated in the Stress and Coping Project has helped us show that society alone is not to blame for anorexia nervosa. Although we can't overlook the important role that the environment plays, it appears that approximately 58% of an individual's liability to anorexia nervosa is due to genes.

This same study also helped answer another important question. Women with anorexia nervosa are often depressed – even after they recover from anorexia. In addition, they often have family members who are depressed. Until now, we did not understand why this was the case. Was it because starvation causes depression (which we know is true because even just dieting can make you depressed)? Or perhaps, might depression be a risk factor for anorexia nervosa? This study showed us that one of the reasons that anorexia and depression occur together so often is because there appear to be some genes that influence the development of both problems—a shared genetic effect.

If you have Internet access and would like to learn more about this study, Virginia Commonwealth University has produced a video news release which can be accessed at: *http://www.vcu.edu/uns/videos/2000/*. Click on Anorexia/Depression Study to view the video.

Gender differences in depression and alcohol problems. Studies of people from many cultures around the world find an intriguing difference between men and women — men are 2-3 times as likely as women to develop alcoholism, and women are about twice as likely as men to develop depression. One proposed explanation for these differences is that depression in women and drinking problems in men arise from the same underlying genetic factors, but that these factors are shaped into different outcomes in men and women because of social expectations about how men and women should behave. For example, feelings of insecurity or sadness could be likely to lead to depression in women, while men are more likely to develop drinking problems.

This summer, three VCU researchers (Drs. Carol Prescott, Steven Aggen, and Kenneth Kendler) published results from a

study addressing this issue. The article, which appeared in the Archives of General Psychiatry (August 2000 issue), was based on interviews with more than 5,500 adult twins who participated in the Stress & Coping Twin Studies. These twins had been asked about a variety of topics, including whether or not they had ever experienced symptoms of depression or drinking problems. The study produced three main results: 1) people who had experienced depression were more likely to develop drinking problems than those who had