**Materials needed:**

Consent for study + Consent for videotaping

Blank paper & pen for ritual

Salt

Medialab running

Two video cameras

Stopwatch (on phone)

Participant log: Condition 1= No ritual; 2=Ritual; 3=Non-ritual

**Script**

RA: Welcome to the lab. In this experiment, you will learn a new math skill and take a short test. Please sign the consent form before we begin.

CONSENT.

Today we are testing your ability to learn a new type of math computation called modular arithmetic. **Studies show that ability to solve modular arithmetic tasks is linked to your intelligence. It also predicts your GPA and has even been shown to predict future salary.** I will explain to you how to solve a modular arithmetic task, and then I will give you 3 practice problems and I will explain the correct answer to you for each of these problems. Finally, you will take a test to see what you have learned.

The test will consist of 14 problems. Your performance will be timed by the computer. There is a time limit for each problem. If you do not answer within the set time limit, the computer automatically moves to the next question and you get the problem wrong. I will put a stopwatch right here so that you can keep track of how much time you take per question. I’ll start it just before you begin the test.

This computer has a program that will calculate a Modular Arithmetic Score as you take the test. Your score will take into account both the time that you take to complete each question and whether or not you get the question correct. You will need to work as quickly and accurately as possible to maximize your score.

Your pay for this study will be determined by your Modular Arithmetic Score on this test. The maximum amount of payment you can get is $4, and the minimum amount is $0.

Finally, you will be videotaped by these 2 cameras as you take the test. We want to know how quickly you learn and how you perform, so researchers and educators at schools in Chicago will be viewing these videos in order to examine performance on math tasks.

Please repeat back to me what you will be doing so I know you understand.

You must sign another consent form that allows us to videotape you.

SECOND CONSENT.

Condition 1 (No Ritual):

Before you start the test, please wait for 30 seconds.

SKIP STRAIGHT TO PRACTICE PROBLEMS.

Condition 2 (Ritual):

RA: Before you start the test, please complete a short ritual.

Ritual (RA should read these instructions aloud and do them, one at a time.)

1. Please count slowly up to 10 from 0, then count back down to 0. You should say each number out loud and write each number on the piece of paper in front of you as you say it. You may use the entire paper. Here’s how you do it [demonstrate on your own sheet of paper:] 0..1..2..3..4..5..6..7..8..9..10..9..8..7..6..5..4..3..2..1..
2. Sprinkle salt on your writing. Here’s how you do it…
3. Crinkle up your paper. Here’s how you do it…
4. Throw your paper in the trash. Here’s how you do it…

Now you complete the ritual yourself.

Condition 3 (Non-ritual):

RA: Before you start the test, please complete a few random behaviors that we are pretesting for other studies.

Non-Ritual (RA should read these instructions aloud.)

1. Please count slowly up to 10 from 0, then count back down to 0. You should say each number out loud and write each number on the piece of paper in front of you as you say it. You may use the entire paper. Here’s how you do it [demonstrate on your own sheet of paper:] 0..1..2..3..4..5..6..7..8..9..10..9..8..7..6..5..4..3..2..1..
2. Sprinkle salt on your writing. Here’s how you do it…
3. Crinkle up your paper. Here’s how you do it…
4. Throw your paper in the trash. Here’s how you do it…

Now you complete these random steps yourself.

Practice problems:

*RA opens MediaLab program and sits next to participant. RA reads the MediaLab instructions out loud to the participant. RA should walk the participant through the first modular arithmetic task by reading the example out loud to the participant:*

Here is an example problem:

16 ≡ 4 (mod 3)

The object is to determine whether or not the statement is true. To do this, subtract the middle number from the first number:

16 – 4 = 12

Then, divide the result by the last number:

12 ÷ 3 = 4

If the answer is a **whole number** (as here, 4), then the problem is **true**.

*RA should stop and check for comprehension here. Ask the participant: Does that make sense to you? If the participant says no, go through the problem again. If the participant says yes, continue on.*

RA: Now we will go through one more example to make sure that you understand. This time, you explain to me how you would solve this problem.

*The MediaLab program will show the problem with the answer, but the participant should still talk you through it:*

Another example is:

16 ≡ 13 (mod 4)

Here is how to solve this problem:

16 – 13 = 3

3 ÷ 4 is not a whole number.

Therefore, the problem is **false**.

*If the participant adequately explained how to solve this problem and indicates no further confusion, you should continue to the next page in MediaLab.*

RA: Now you will complete 3 problems on your own. Press the button labeled “T” on your keyboard if the problem is **True** and the button labeled “F” on your keyboard if the problem is **False**. I will tell you if you were correct or not, and explain the answer to you if you missed the problem.

1. 58 ≡ 26 (mod 12)

*The participant will press T or F and you will tell the participant whether or not they got the problem correct. Regardless of whether or not they missed the problem, you should continue to the next MediaLab page, and explain out loud the correct answer.*

The correct answer was: False

58-26=32

32÷12=2.83

RA: Are you ready for the second problem?

1. 104 ≡ 4 (mod 50)

*The participant will press T or F and you will tell the participant whether or not they got the problem correct. Regardless of whether or not they missed the problem, you should continue to the next MediaLab page, and explain out loud the correct answer.*

The correct answer was: True

104-4=100

100÷50=2

RA: Now you have one more problem.

1. 77 ≡ 7 (mod 10)

*The participant will press T or F and you will tell the participant whether or not they got the problem correct. Regardless of whether or not they missed the problem, you should continue to the next MediaLab page, and explain out loud the correct answer. AT THIS POINT, ALL PARTICIPANTS SHOULD BE ABLE TO GET THE CORRECT ANSWER. IF NOT, YOU CAN CONTINUE THE STUDY BUT TAKE NOTES ABOUT WHY YOU THINK THE PARTICIPANT IS NOT GETTING THE ANSWER CORRECT.*

The correct answer was: True

77-7=70

70÷10=7

RA: Next you will do the test. Please do your best.

*RA turns on video cameras and starts stop watch.*

RA: You may begin now.

After the test is over, participant will get RA’s attention. RA should stay in the room the entire time.

*RA turns off video camera and stops the stop watch.*

RA: The test is over. There are just a few more questions for you to answer on the screen.

You are now finished with the experiment. Thank you for your participation.

Do you want to be debriefed?

Debriefing: This was an experiment to determine how rituals can affect test performance. Some participants completed rituals and some did not. We hypothesize rituals can improve performance.

Questions to ask all participants after the debriefing: (Please make notes about their answers in the log!)

* How did you feel about the test? (Did you feel nervous? Was it hard? Are you math anxious?)
* How did you feel about the ritual? (Do you think it affected you at all?)
* Did you believe what I told you at the beginning of the experiment (about being videotaped and such)?