LOW KNOWLEDGE/FEEDBACK CONDITION

*WHAT TO BRING*

Papers/Forms

* Participant List, Schedule
* Scripts (Intervention and Posttest) & Scrap Paper
* Posttests, Strategy Record Sheet, Subjective Questions Sheet, Digit Span Sheet

Computer

* Power Cord, Mouse, Number Pad
* Microphone, Digital Voice Recorder, Batteries

Other/Miscellaneous

* Pencils
* File folder for putting collected data in
* Extension cord and 3-prong adapter

*SET UP*

1. Turn on laptop. Plug in number pad & mouse (USB ports).
2. Set up webcam and microphone.
   1. Plug in microphone (rightmost input under trackpad). Two windows pop up. In the beige window, click “Device: Mic.” Close the black window.
   2. Double click on the Camtasia Recorder icon on desktop.
   3. Make sure microphone is on and working.
   4. Press the record button. After experiment is finished, press Function+F10. The video will open in a screen. Save it. You are now ready to run the next child.
3. Open E-Prime Program on desktop (ATME3d\_FINAL). Enter participant ID, grade, and your initials. Then select the number corresponding to the child’s condition.
   1. If you need to exit E-prime during the program, press CTRL+ALT+SHIFT.
   2. Cap a session at 60 minutes.

*INTRODUCTION*

**Today you’re going to try to solve some math problems. You will learn a lot of new things, but it won’t be easy. You will probably make mistakes. That’s okay. The most important thing will be for you to think about the problems and try to understand them. This will give you a chance to practice and improve your abilities in math. These problems are important because if you try your best to understand the problems, you will learn more about math! So what we want you to do is learn new things.**

*PROCEDURAL INSTRUCTION*

**Now, we’re going to go through a short lesson together about how to complete a short math activity. The problems will look something like this:** (Mouse click)

**3 + 4 9**

**Just like this problem, the problems we’ll work on right now will have two boxes. There will be one yellow box and one blue box. Today I’m going to show you how to complete this short math activity.**

**First, you should see that one of the boxes will have a single number. The other box will have two numbers with a plus sign. For this problem, the yellow box has a 3 + 4** (point) **and the blue box has a 9** (point)**.**

**Here is how you can complete this activity.**

**First, you add up the numbers in the box with two numbers and the plus sign** (point**) and think about the number they add up to.**

**Then, decide which box has the bigger number.**

**So for this problem, what is 3 + 4?** (Wait for response.)

**Right, the yellow box has 7.**

**And what number is in the blue box?** (Wait for response.)

**Right, 9.**

**So if this box has 3 + 4 and this box has 9, which box has the bigger number?**

**Right, the blue box has the bigger number.**

**Let’s look at another one.** (Mouse click)

**23 19 + 8**

**Every time you see the two boxes like this, you can:**

**First, add up the numbers in the box with the two numbers and the plus sign** (point).

**Then, decide which box has the bigger number.**

**So for this problem, what is 19 + 8?** (Wait for response.)

**Right, the blue box has 27.**

**And what number is in the yellow box?** (Wait for response).

**Right, 23.**

**So if this box has 23 and this box has 19 + 8, which box has the bigger number?**

**Right, the blue box has the bigger number.**

**Okay, let’s try another example.** (Mouse click)

**9 + 8 14**

**Can you tell me which box to start with on this problem?** (Wait for response.)

**Right, we start with the box that has two numbers and a plus sign. So we can add up the two numbers in this box** (point) **and then decide whether the yellow box or the blue box has the bigger number.**

**If we add up the numbers in the yellow box, what do we get?** (Wait for response.)

**We get 17.**

**What is our next step?** (Wait for response.)

**To finish, we decide which box has the bigger number.**

**So if this box has 9 + 8 and this box has 14, which box has the bigger number?**

**Right, the yellow box has the bigger number.**

**Now I want you to think about what we have done so far, and let’s look at one more example together, okay?** (Mouse click)

**7 + 4 10**

**Can you point to the box we’re going to start with?** (Wait for response.)

**We start with the yellow box** (point)**.**

**How should we complete this problem?** (Wait for response.)

**We start by adding up the two numbers in the yellow box.**

**What do the two numbers add up to?** (Wait for response.)

**Right, the yellow box has 11.**

**And what number is in the blue box** (point)**?** (Wait for response.)

**The blue box has 11. So if this box has 7 + 4 and this box has 10, which box has the bigger number?**

**Right, the yellow box has the bigger number.**

*MANIPULATION CHECK*

Turn on digital voice recorder. Have child solve problems until he/she gets one correct.

**Okay. Now we’re going to move on to something different. First, I would like you to try to solve a problem on your own.** (Mouse click)

**Find the number that goes in the blank to make this number sentence true.**

**7 + 6 + 2 = 7 + \_\_**

(Have child type in response with number pas and then hit ENTER.)

**How did you solve that problem?**

**Thanks for all your hard work!** (No real feedback.)

Click and computer will go to a READY screen.

*EXPLORATORY PROBLEM SOLVING*

**Now I’m going to have you practice solving some problems on your own. These are similar to the problem you just solved. For these problems, you need to figure out the number that goes in the box to make the number sentence true. Some of them may seem difficult or unfamiliar. That’s okay. Just try your best.**

**After each problem, I would like you to tell me when you are finished.**

**Let’s look at the first problem.** (Mouse click)

**Try to figure out the number that goes in the box to make this number sentence true. Here is some scratch paper to use if you want to. When you have your answer, you can type it using this** (hand them number pad), **and press Enter.**

1) 10 = 3 + \_\_

**Can you tell me how you solved that problem?**

Record child’s strategy on the strategy record sheet. If it is ambiguous, give additional prompt.

**I’m not sure I understand. Can you point to the exact numbers that you added or subtracted or tell me the numbers?** Mark any strategies on the record sheet that need confirmed.

If CORRECT answer: (Mouse click) **Good job! You got the right answer. 7 is the correct answer. Let’s try another one.**

If INCORRECT answer: (Mouse click) **Good try, but you did not get the right answer. [Child’s answer] is not the correct number. Let’s try another one.**

Repeat for remaining problems.

2) 3 + 7 = 3 + \_\_

3) 3 + 7 = \_\_ + 6

4) 3 + 6 = 3 + \_\_

5) 3 + 4 + 8 = \_\_ + 8

6) 5 + 3 + 9 = 5 + \_\_

7) 9 = 3 + \_\_

8) 9 + 7 + 6 = \_\_ + 6

9) 3 + 7 + 8 = \_\_ + 8

10) 7 = 6 + \_\_

11) 4 + 5 + 3 = 4 + \_\_

12) 8 + 3 + 7 = \_\_ + 7

After the last problem, a Subjective Questions screen will appear.

*SUBJECTIVE QUESTIONS*

Turn off digital voice recorder.

**Thanks for all your hard work! I’m interested in what you think about the problems you just solved. There are a few statements that I’ll read through with you.** Hand student the paper.

**On each one, circle the answer that shows how much you disagree or agree with the sentence. Strongly Disagree means that “NO” you disagree a lot with what the sentence says. Disagree means that NO, you disagree with the sentence, but not a lot. Agree means, YES you agree with the sentence, but not a lot. Strongly agree means YES you agree a lot with what the sentence says.**

**When solving the problems just now:**

**1. I had to think hard to do this math work. Do you strongly disagree, disagree, agree or strongly agree? Point to the number that matches your response.**

**3. I was stressed and irritated when I did this math work.**

**Now I’d like to ask you about the kinds of thoughts and feelings you had while solving the problems on the computer just now. I will tell you some thoughts or feelings that kids sometimes have. For each one, point to the number that matches your response. When I was solving problems on the computer…**

**5. I enjoyed solving the math problems very much.**

**7. These math problems were fun to do.**

**9. The math problems were very interesting.**

*BREAK*

Give students a short break—mostly to pick out their candy. Let student stretch or get a drink of water if necessary. (There will be a white blank screen followed by a READY screen.)

*POSTTEST*

MEMORY PROBLEMS

**Now, I’m going to have you answer a few questions on paper. First, I’d like you to remember a problem for me. I’m going to show you a math problem on the computer for 5 seconds. I don’t want you to solve it. Just look at it carefully, and try to remember exactly what you see. After the problem goes away, I want you to write exactly what you saw. Are you ready?**

Press mouse button when ready for first problem. It will appear for 5 seconds and then a gray screen will appear for 20 seconds. If they finish before 20 seconds, you can click to move on.

Problem a: 4 + 3 + 9 = 4 + \_\_

Problem b: 8 + 6 + 3 = \_\_ + 2

**Now we’ll go through the rest of the packet together. Turn to page 2.** (Mouse click and the computer will time the rest of the posttest.)

OPEN-ENDED PROBLEMS (Pages 2 & 3)

**Here I’d like you to solve some problems on your own. Figure out what number goes in the box. Please write down the numbers that you added or subtracted. You may work until you get to the stop sign on page 3. If you have any questions, please ask and I will try to help.**

Check to make sure child shows work on open-ended problems.

Read through each question for the rest of the posttest.

Mouse click when finished. A READY screen will appear. Click to time BDS task.

*BACKWARD DIGIT SPAN TASK*

Read a series of digits. After the final digit, the child is expected to repeat the digits backward.

**Okay, we’re finished with the questions on paper. Now we’re going to do a different sort of task. I am going to say some numbers. When I am finished I want you to say the numbers in backward order. For example, if I say 8 – 2, what would you say?**

CORRECTLY: If the child responds correctly (2 – 8): **That’s right.**

Proceed to Trial 1.

INCORRECTLY: If the child responds incorrectly: **No, you would say 2 – 8. I said 8 – 2, so to say it backward, you would say 2 – 8. Now try these numbers. Remember, you are to say them backward. 5 – 6.**

Whether or not the child response correctly (6 –5) to the second sample item proceed to trial 1. Give no help on the second example or on any of the test items that follow.

*RETRIEVAL FLUENCY TASK*

**Great job so far! Are you ready for one last activity? I am going to give you a category, and I would like you to say as many words from that category as you can. For example, if I said the category “furniture,” you could say “chair, bookshelf, and sofa.” Can you think of another word that belongs to the category “furniture?”**

Wait for response. Give feedback (e.g., **That’s right. / Hmm, can you think of something else?)**

**I would like you to spend 1 minute naming as many things in a category as fast as you can. Do you have any questions?**

**Okay, let’s begin. The first category is “ANIMALS.” Please name as many animals as you can. You may begin.** (Hit record and say the subject number. Click so computer will time for 1 minute. Write down what student says on the back of the Backward Digit Span sheet.)

When 1 minute is over: **Okay, now let’s move on to one more category. This time, I would like you to name as many “THINGS TO EAT” as you can. You may begin.** (Make sure you are recording. Time for 1 minute. If child starts naming weird things, such as grasshoppers or other bugs, tell them to stick to things people normally eat.)

When 1 minute is over: **Okay, great job today! Thanks for all your help.**

*END OF SESSION*

Take child back to classroom.