One of the goals of the LEAD lab is to characterize children’s knowledge – to find out how they think about different math problems, to find out what strategies they use, and to find out what kinds of errors they make. Below is one of the ways we characterize this knowledge on a particular type of math problem, called a mathematical equivalence problem. The “codes” below represent different strategies that children often use to solve these problems.

Your task is to study this “coding scheme” and then try to use it on real data. In a separate excel file, there is data from different children solving a math equivalence problem. The spreadsheet includes the children’s numerical answer as well as their verbal explanations as to how they solved it. Your task is to look at their answers, read their verbal explanations and then decide which strategy they used based on the coding scheme below. Once you’ve decided, mark that response with the designated code (e.g., if they used the add-all strategy, then record AA in the excel file for that child).

Once complete, send the excel file back to Dr. Fyfe ([efyfe@indiana.edu)](mailto:efyfe@indiana.edu)) along with any comments, questions, or thoughts you have on the task.

***MATHEMATICAL EQUIVALENCE PROBLEMS CODING SCHEME***

Children were asked to solve six mathematical equivalence problems with operations on both sides of the equal sign (e.g., 6 + 5 + 4 = 6 + \_\_). Then they were asked, “How did get you X?” (with x being the child’s answer). We want to code their strategy use from their answer and from their verbal explanation. There are three correct codes and four incorrect codes.

CORRECT STRATEGIES

1. **EQ (Equalize – correct code)**

Child adds up numbers on one side and figures out what number goes in the blank to make the other size the same. Has a clear understanding the two sides must be equal. Usually adds up the second side. This is a correct strategy.

Example: “I added 6, 5, and 4, and got 15. Then I knew 6 plus 9 is 15.”

1. **AS (Add-Subtract – correct code)**

Child adds the numbers on the left side of the equal sign and then subtracts the number on the right side of the equal sign.

Example: “6 plus 5 is 11, and 11 plus 4 is 15. Then I know 15 minus 6 is 9.”

1. **GR (Grouping – correct code)**

Child groups or cancels out the repeated addend on both sides of the equation and just adds up the other numbers to find the answer.

Example: “I saw there was a six here and a six here and 5 plus 4 is 9.”

INCORRECT STRATEGIES

1. **AA (Add-All – incorrect code)**

Child adds all the numbers in the problem and puts the sum in the blank. Answer need not be exact (e.g., may be within one or two of the total of the numbers).

Example: “I added them all together.”

1. **AE (Add-to-Equal – incorrect code)**

Child adds all the numbers before the equal sign.

Example: “Six plus five is 11 and 11 plus 4 is 15.”

1. **CR (Carry – incorrect code)**

Child copies a number from the problem into the blank.

Example: “I saw 6 then 5 here so I put a 6 then 5 here.” “I put the 4.”

1. **OT (Other – incorrect code)**

Child uses a random incorrect strategy, gives no response to clear up an ambiguous answer, or states that he/she doesn’t know.”

Example: “These make it higher.” “I don’t know.”