Applying Cognitive Psychology Methods Activity 4: Problem Solving and Creativity

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Problem Solving Tasks

Task 1

Goal: Find each position and suit for each card in the row.

From Table 1, we know the Queen can only be in the middle or right column. Similarly, the Jack can only be in the left or middle column. Whereas, the King could be in any row. This implies that the Queen must be in the right column, but does not give us enough information for positioning of the King or the Jack.

We know the Spade must be in the right column because it is the only suit that is present. This means the right card must be a Queen of Spades. From here, we can construct Table 2 that will have more restrictions which will allow us to decipher the remaining 4 variables.

From Table 2, can make out that since the King must be to the right of the Spade, it can be in either the left or middle column. The same argument for the Jack, only instead of a Spade, it needs to the left of the Queen. Because the Diamond needs to be to the left of the Spade, and the King needs to be to the right of the Heart, that means the Jack must be a Heart, and must be in the left column. This leaves the King and the Diamond suit to be in the middle. We know this works because the King is to the left of the Spade, and the Diamond is also to the left of the Spade. This leaves us with the Table 3.

Task 2

For this task, we need to find the worst case scenario for the maximum amount of coins needed. That being said, in the second digit position, we would have a 9. This way, we know we need at least 4 pennies and 1 nickel. Since we found the lowest amount of coins for the second digit, now we need to find the lowest amount of coins for the first digit. We know that it must have 1 half-dollar because we want to use the least amount of coins possible. Following the same logic, we need to have 1 quarter to get us up to 84. Lastly, we would need 1 dime to get us to 94. Thus, we would need 8 total coins. (Note that another possible solution could be 99 because we would still use 8 coins to get us to that number: 1 half-dollar, 1 quarter, 2 dimes, and 4 pennies.)

Creativity Tasks

Task 3

This task is answered in Table 4

Evaluation Questions

Problem Solving Tasks

1. Describe how you solved each problem. What strategies did you use? (make sure to mention any *restructuring* **or** *insights* you experienced) **(6 pts)**

   > ***Solution.*** For the first task, I started by simply following the rules that were laid out in front of me. I made a table to more easily visualize what the rules dictated, and then I tried to solve it from there. At first, I thought the rules implied that the suit or card must be *directly* next to whatever it was stipulating, but I knew I needed to *restructure*—change the problem's representation—when I was stuck with 4 rows, and only 1 item in the left column.
   >
   > Thus, I redid the problem, and this time when the rule said "to the left (or right)," I made sure to add the requisite content to both columns (if applicable) instead of one.
   >
   > For the second task . . .

2. Describe any obstacles you faced in solving these problems – or, if you did not, how might *mental set* **or** *functional fixedness* play a role. **(4 pts)**

   > ***Solution.*** With the first task, I struggled with a mental set—a preconcieved notion of how to solve a problem. I was stuck on the idea that the suit or card must be *directly* next to whatever it was stipulating. This is because when I was told it needs to be "to the left (or right)" in the past, I always positioned it *directly* next to it.

3. For each task, describe at least one other cognition that you employed (e.g., working memory, attention) and describe how that cognition is connected to problem-solving.

(Make sure to include all relevant components of your cognition and define those components) **(15 pts)**

> ***Solution.*** For the first task, I used *working memory*—a limited-capacity system for temporary storage and manipulation of information for complex tasks like *reasoning*—to keep track of the rules that were given to me, and assign cards based on that rule. Because my *control process*—strategy I used to help make a stimulus more memorable—had to keep track of a lot of information (e.g.,) like I had to remember that the Queen could only be in the middle or right column, the Jack could only be in the left or middle column, and the King could be in any row.

4. Evaluate these tasks. Is each one a good test of problem-solving? Why or why not? **(3 pts)**

> ***Solution.***

Creativity Task

5. Describe how you solved each test (coming up with the correct words). Did you use strategies? If so, what did that process look like? **(4 pts)**

> ***Solution.***

6. How does this task engage controlled processes? How does it engage associative processes? **(15 pts)**

> ***Solution.***

7. Evaluate this task. Is it a good test of creativity? Why or why not? **(3 pts)**

> ***Solution.***

Possibilities	Left	Middle	Right
1a	Jack	Queen	—
1b	Jack	Jack	Queen
2a	Diamond	Spade	—
2b	Diamond	Diamond	Spade
3a	Heart	Heart	King
3b	Heart	King	—
4a	—	King	Spade
4b	King	Spade	Spade

Table 1

Initial Setup Adhering to All Rules

Possibilities	Left	Middle	Right
1b	Jack	Jack	Queen
2b	Diamond	Diamond	Spade
3b	Heart	King	—
4a	—	King	Spade

Table 2

Queen of Spades in Right Column for Restriction

Possibilities	Left	Middle	Right
1	Jack of Hearts	King of Diamonds	Queen of Spades

Table 3

Final Table

List	Your Answer
Falling Actor Dust	Star
Broken Clear Eye	Glass
Skunk Kings Boiled	Cabbage
Widow Bite Monkey	Spider
Bass Complex Sleep	Deep

List	Your Answer
Ink Herring Neck	Red
Measure Desk Scotch	Tape
Strike Same Tennis	Match
Athletes Web Rabbit	Foot
Board Magic Death	Black

Table 4

Remote Associations Tasks