Roulettes Task Description

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Requirements: E-Prime 2.0
Function assessed: Decision making under risk / risk adjustment.

Aim of this task: The Roulettes Task assesses risky decision making for rewards (money gain) and punishments (money loss) separately. More specifically, this tasks assesses whether the participant adjusts is risky behavior according to the probabilities and importance of the outcome. It assesses "hot" executive functions (cognition influenced by emotion).

Reference of the task: this task is an adaptation of Levin´s Cups Task:

Levin IP, Weller JA, Pederson AA, & Harshman L (2007). Age-related differences in adaptive decision making: sensitivity to expected value in risky choice. Judgment and Decision Making 2:225-223 (see also Weller JA, Levin IP, Shiv B, Bechara A. 2009. The effects of insula damage on decision-making for risky gains and losses. Social Neuroscience 4:347-58.)

Main outcomes (to be selected based on the specific hypotheses of the study):

- Total number of risky decisions
- Number of risky decisions – Gain domain
- Number of risky decisions – Loss domain

- Total number of advantageous risky decisions (0 to 18)
- Number of advantageous risky decision – gain domain (0 to 9)
- Number of advantageous risky decisions – loss domain (0 to 9)

- Total number of disadvantageous risky decisions (0 to 18)
- Number of disadvantageous risky decision – gains domain (0 to 9)
- Number of disadvantageous risky decision – loss domain (0 to 9)

- Total risk adjustment (i.e. # of advantageous risky decisions - # of disadvantageous risky decisions) (-18 to 18)
- Risk adjustment – gain domain (-9 to 9)
- Risk adjustment – loss domain (-9 to 9)

Advantages over the Iowa Gambling Task: 1) Less influenced by learning processes; 2) Allows the assessment of risky decision making under gain and loss conditions separately; 3) Shorter.

How to interpret performance:

Optimal performance = risky advantageous high, risky disadvantageous low
Risk seeking / impulsive = total number of risky decisions high
Risk aversion = total number of risky decisions low
Loss aversion = optimal performance in gain domain, risk aversion profile in loss domain.

Risk insensitive = Risk adjustment index near 0.

Complete description for manuscripts:

Decision making under risk was assessed using the Roulettes Task, an adapted version of the Cups Task (Levin et al., 2007). In this task, the participant is presented with two wheels divided by segments of equal size and each associated with an amount of money. On each trial, the participant is asked to choose which wheel to spin, in order to gain money, or to avoid losing money. After the response, the wheel selected is spun for 2 seconds, then ends on the amount of money to be won or lost. One wheel is riskless: each segment has the same small amount of money associated with it ($±1.00). The other wheel represents a risky choice: only one segment has an amount associated with it ($±2.00, $±3.00, or $±5.00) while the other segments have $0.00. Both wheels have the same number of segments, which vary between 2, 3 and 5; thus, when selecting the risky wheel, chances were either 50%, 33%, or 20% that the wheel will stop on the segment associated with an amount of money. Half trials are gains trials (i.e., with a positive amount of money), the other half are loss trials (with a negative amount of money). The entire task comprises 54 trials. In each condition (gain and loss), there is an equal number of risk-advantageous, risk-disadvantageous, and equal expected value (EV) trials. Trials with equal EV for the risky and riskless options were 50% x ±2.00, 33% x ±3.00, and 20% x ±$5.00. Risk-advantageous trials were: 50% x +$5.00, 50% x +$3.00, 33% x $5.00 on gain trials, and 33% x -$2.00, 20% x -$2.00, 20% x -$3.00. Risk-disadvantageous trials were: 33% x +$2.00, 20% x +$2.00, 20% x $3.00 on gain trials, and 50% x -$5.00, 50% x -$3.00, 33% x -$5.00 on loss trials. The outcome (amount of money won/loss) is presented for 1.5 s. After the result, 1 sec. preceded the next trial.

Instructions:

The participant should be seated in front of a computer in a silent room. The examiner should be present during the entire experiment.

Open the task in E-Prime, and write the appropriate participant ID. Start the task and read the instructions aloud with the participant:

"This game is called *The Wheel of Fortune*. It is a game of chance in which the goal is to make as much money as possible"

Press any key, and continue reading:

"Two wheels like those below will appear on the screen. These wheels are divided into segments. On each segment is an amount of money. The left wheel (point the left wheel) **has a segment with a larger amount of money (in this case 2$), and its other segments are empty (0$). By contrast, all segments of the right wheel** (point the right wheel) **have the same amount of 1 $. Your task is to select, using the left and right arrows on the keyboard, which wheel you want to spin. The wheel you will select will be spun for some time. When it stops spinning, a gray arrow below it will indicate on which segment it ended and thus, how much money you won."**

Pointing the left wheel and continue reading: **"The left wheels is a "risky" option because you don't know on which segment the wheel will stop spinning. The more segments, the less likely it is that it will stop on the larger amount of money."**

Pointing the right wheel and continue reading: **"The right wheel is a "safe" option because you are sure that the wheel will stop on a segment with 1$."**

Press any key and continue reading the instructions:

"Wheels can be either blue or red. On trials with blue wheels, you will gain the amount of money of the segment on which the wheel stops spinning, because there is a 'plus' sign before the number. On the trials with red wheels, you will lose the amount of money on which the wheel stops spinning, because there is a 'minus' sign before the number."

Press a key to start the demonstration trial. The demonstration should be done by the experimenter, not the participant. Say:

"Here, the left wheel has a segment with 5$, and two segments with 0$. The right wheel has three segments with 1$ each. If I spin the right wheel, I am sure to win 1$. If I spin the left wheel, I have one chance to win 5$, but two chances to win nothing. Let's suppose I want to take the risk and press the left key."

Press the left arrow key.

"Unfortunately, I have won nothing. Now, if I spin the left wheel, there is a chance that I will lose 3$, but there is also a chance that I will lose nothing. If I spin the right wheel, I am sure that I will lose 1$. Again, let's suppose I want to take the risk and press the left key."

Press the left arrow key.

“Unfortunately, I have lost 3$. Now it’s your turn.” (Read the instructions) **“You will have to play until the computer stops the game. You will only know the total amount of money that you have accumulated (or lost) at the end of the task. Like in a real game of chance, the computer will not change your chances of winning or losing once the game has started, so please do not try to understand what the computer is doing. Please do the task as if you were using real money, and base each of your decisions on what you would do if you were using your own money. Do you have any questions?”**

Press a key to begin the task.

(Let the participant play)

End of the task: congratulations, you would have won XX $.

Document prepared by Olivier Boucher, Ph.D, neuropsychologist.