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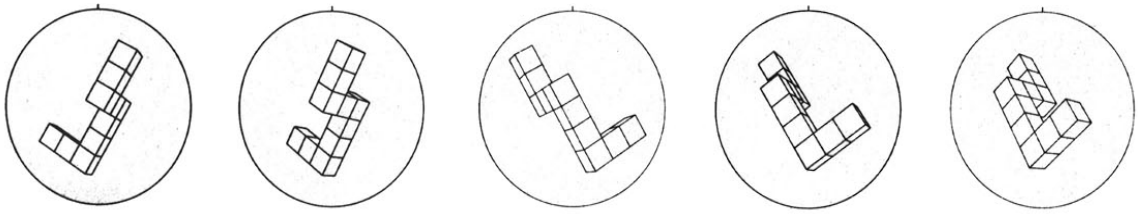
Appendix A

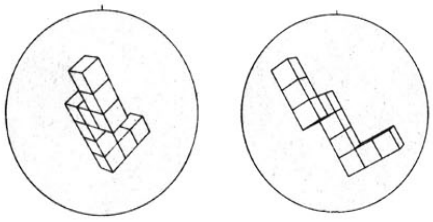
Instructions and Sample Questions for Mental Rotation Task (MRT) (adapted from Vandenberg & Kuse, 1978)

Mental Rotation Test

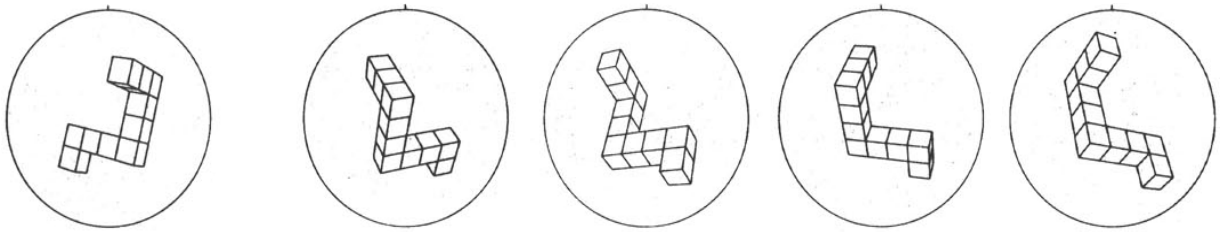
This is a test of your ability to look at a drawing of a given object and find the same object within a set of dissimilar objects. The only difference between the original object and the chosen object will be that they are presented at different angles. An illustration of this principle is given below where the same single object is given in five different positions. Look at each of them to satisfy yourself that they are only presented at different angles from one another.



Below are two drawings of new objects. They cannot be made to match the above five drawings. Please note that you may not turn over the objects. Satisfy yourself that they are different from the above.



Now let's do some sample problems. For each problem there is a primary object on the far left. You are to determine which two of four objects to the right are the same object given on the far left. In each problem always <u>two</u> of the four drawings are the same object as the one on the left. You are to put Xs in the boxes below the correct ones, and leave the incorrect ones blank. The first sample problem is done for you.



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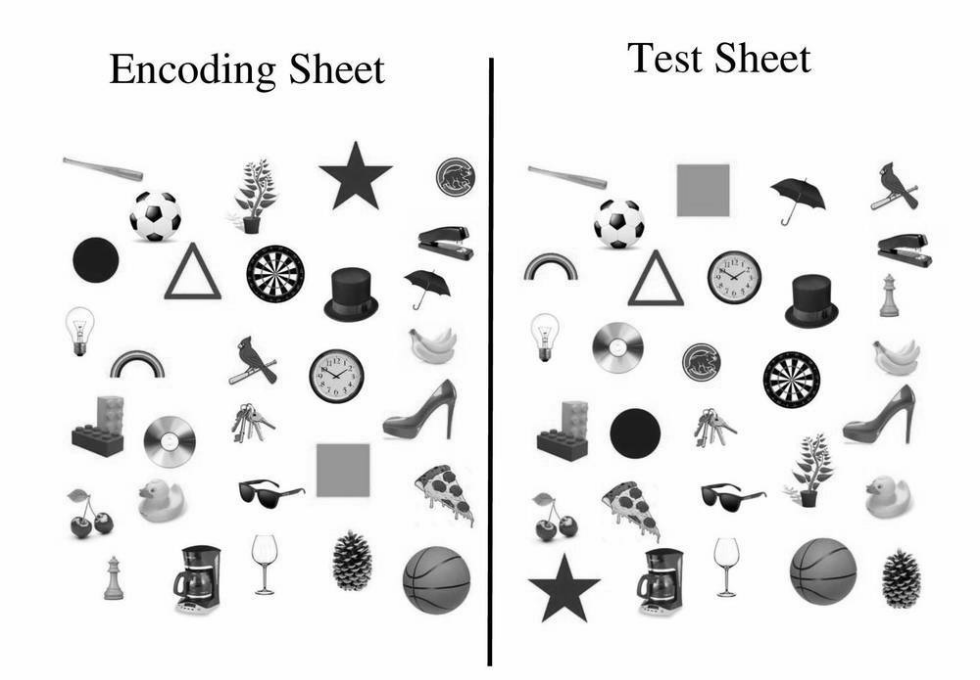
Appendix B

Encoding Sheet and Test Sheet for Object Location Memory (OLM) Task



(Stimuli adapted from Boomgarden, Nardi, & Aronson, 2019). Participants will be given one minute to encode the objects on the encoding sheet and then will be presented with a test sheet composed of another array of 30 random open-source images of objects. On the test sheet 16 of the objects will be placed in different locations and participants will be instructed to indicate (in a multi-answer multiple-choice format) all objects that were moved. For scoring, any object that is correctly identified will count for one point while any object incorrectly identified will count as one subtracted point.

Appendix C

Spatial Anxiety Scale (SNS) Items (adapted from Lyons et al., 2018)

Subscale	Sample Item
M	Asked to imagine the 3-dimensional structure of a complex molecule using only a 2-dimensional picture for reference
M	Asked to determine how a series of pulleys will interact given only a 2-dimensional diagram
N	Finding your way to an appointment in an area of a city or town with which you are not familiar
N	Finding your way back to your hotel after becoming lost in a new city
I	Asked to recall the shade and pattern of a person's tie you met for the first time the previous evening
I	Asked to give a detailed description of a person's face whom you've only met once

Note. This scale provides two items for each subscale from the Spatial Anxiety Scale: Mental Manipulation (M), Navigation (N), and Imagery (I). Instructions: “The items in the questionnaire below refer to situations and experiences that may cause tension, apprehension, or anxiety. For each item, mark the response that describes how much you would be made to feel anxious by it. Work quickly but be sure to think about each item.” Response options: ‘not at all’, ‘a little’, ‘a fair amount’, ‘much’, ‘very much’. Scoring: 0 (not at all) to 4 (very much); sum scores across the 8 items for each subscale.

Appendix D

Gender-Related Attributes Survey (GERAS) Items (adapted from Gruber et al., 2020)

Subscale	Sample Item	Coded Value
P	Compassionate	F+
P	Tender	F+
P	Dominate	M-
P	Brave	M+
C	To write a computer program	M
C	To find an address for the first time	M
C	To remember names and faces	F
C	Remembering events from your own life	F
IA	Watching action movies	M
IA	To gossip	F
IA	Rhythmic gymnastics	F
IA	Doing certain sports (soccer, basketball, handball, etc.)	M

Note. Table provides four items for each subscale from the Gender-Related Attributes Survey: Personality (P), Cognition (C), and Interests and Activities (IA). Personality subsection instructions: "Please rate the following characteristics on a scale ranging from 1 to 7, according to how often you think these apply to you." Personality subscale response options: 'never' to 'always'. Scoring: 0 (never) to 6 (always); sum scores across the 20 items for this subscale. Cognition subsection instructions: "On a scale ranging from 1 (being very hard) to 7 (7 being very easy), how hard or easy would you say it would be for you to do the following tasks." Cognition subscale response options: 'hard' to 'easy'. Scoring: 0 (hard) to 6 (easy); sum scores across the 14 items for this subscale. Interests and Activities subsection instructions: "Please rate on a scale of 1 (not at all) to 7 (very much) how much you like the following activities." Interests and Activities subscale response options: 'not at all' to 'very much'. Scoring: 0 (not at all) to 6 (very much); sum scores across the 16 items for this subscale.

Appendix E

Survey of Spatial Representation and Activities (SSRA) (adapted from Terlecki & Newcombe, 2005)

Section A

1. Have you taken math or science related courses within the past year (select one)?
   Yes / No
   If so, how many of each type? Math: text field Science: text field
2. What kind of computer software do you own or use? (for each, indicate how many you frequently use)?
   A. Word processing, Frequency: text field
   B. Statistics programs, Frequency: text field
   C. Games, Frequency: text field
   D. Art/drawing, frequency: text field
   E. Other? Text field
3. Do you participate in any extracurricular sports? (indicate all that apply, if none, enter zero)
   Professional sports: text field
   College-level sports: text field
   Intramural sports: text field
   Other (please list)? text field
4. Do you own any video game systems? (indicate how many)

Section B

1. Do you own a computer? Yes / No
2. How long have you owned/been using a computer?
   A. Less than a month
   B. 1-6 months
   C. 6 months to 1 year
   D. 1 to 3 years
   E. 3 or more years

For questions 3 through 8, please use the following rating scale:

A. Daily
B. Weekly
C. 1 to 2 times a month
D. 1 to 2 times in 6 months
E. 1 to 2 times a year
F. Once every few years or not much at all

3. How often do you use a computer?
4. How often do you purchase software?
5. How often do you use the internet?

6. How often do you use any game systems (Nintendo, Sega, Xbox, etc.)?
7. How often do you play boardgames?
8. How often do you use maps?

For questions 9 through 11, please use the following rating scale:

A. Very skilled
B. Moderately skilled
C. Not very skilled
D. No skill

9. How proficient or skilled do you believe you are at using maps?
10. How proficient or skilled do you believe you are at using computers?
11. How proficient or skilled do you believe you are at playing video games?

Appendix F

Child Activities Questionnaire (CAQ) Items (adapted from Cherney & Voyer, 2010)

Sample Item	Coded Value	Spatial or Non-Spatial
Play musical instruments	F	Spatial
Puzzles	F	Spatial
Baby dolls	F	Non-spatial
Barbie dolls and similar	F	Non-spatial
Coloring	F	Non-spatial
Crafts	F	Non-spatial
Air hockey	M	Spatial
Baseball	M	Spatial
Blocks	M	Spatial
Ping pong	M	Spatial
Videogames (2D)	M	Non-spatial
Watching television	M	Non-spatial

Note. Table provides six items from the Child Activities Questionnaire and includes masculine (M) and feminie (F) distinctions for each activity along with spatial or non-spatial distinctions. Instructions: "This questionnaire aims to determine the activities that you enjoyed as a child. Accordingly, you should consider each of the activities listed below and indicate how frequently you practiced each of them as a child." Response options: 'not at all' to 'frequently'. Scoring: 0 (not at all) to 4 (frequently); responses will be totaled to provide an overall score that indicates the types of activities the participant engaged in most often.