

UK Biobank

Touch-screen Pairs memory test

Version 1.2

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This manual details the procedure for the touch-Screen part of the Pairs memory test at an Assessment Centre of the UK Biobank

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1. Introduction

1.1: This manual details the procedure for the touch-screen part of the Pairs memory test at an Assessment Centre of the UK Biobank. This takes place at the 2nd ‘station’ of the Assessment Centre visit, as listed in Table 1.

Table 1: Sequence of assessment visit

	Visit station	Assessments undertaken
1	Reception	<ul style="list-style-type: none"> • Welcome & registration • Generating a USB key for Participants
2	Touch screen Section	<ul style="list-style-type: none"> • Consent • Touch screen questionnaire • Hearing Test • Cognitive function tests
3	Interview & blood pressure	<ul style="list-style-type: none"> • Interviewer questionnaire • Blood pressure measurement • Measurement of arterial stiffness
4	Eye measurements	<ul style="list-style-type: none"> • Visual acuity • Refractometry • Intraocular pressure • Optical Coherence Tomography
5	Physical measurements	<ul style="list-style-type: none"> • Height (Standing and Sitting) • Hip & Waist measurement • Weight and Bio-impedance measurement • Hand-grip strength • Ultrasound Bone Densitometry • Spirometry (Lung function test)
6	Cardio-respiratory fitness test	<ul style="list-style-type: none"> • Exercise/fitness ECG test
7	Sample collection & exit	<ul style="list-style-type: none"> • Blood samples collected • Urine sample collected • Saliva sample collected
8	Web-based diet questionnaire	<ul style="list-style-type: none"> • Dietary assessment

1.2: Throughout this document, the term ‘Participant’ signifies a study participant who is taking part in the Assessment Centre process, regardless of whether they eventually give or withhold consent to take part in the UK Biobank study.

1.3: The collection of data from assessment visits uses the direct data entry system of the Assessment Centre Environment (ACE).

1.4: At the start of their visit, each participant is issued with a USB key at the Reception station. This contains Participant ID, name, date of birth and gender. As the participant

progresses between stations the USB key acts as an identifying token. The USB key is encrypted so can only be read by assessment centre computers. None of the participant's test data is transferred to the USB key. At the end of the assessment visit all identifying data on the USB key is removed.

2 Staff

This procedure is performed by the Receptionist or any staff member who has received suitable training and has been granted the relevant module permissions. These staff can include: Study Interviewer, Duty Manager, Phlebotomist, Laboratory Technician or Measurement Technician. Two members of staff are always present to oversee the touch screen and web diet questionnaire areas. The Assessment Centre Manager oversees that all staff work in accordance with this procedure.

3 Pairs memory test

3.1: During the main phase of recruitment, several cognitive function tests were performed in the following order:

- 1: Prospective Memory test: Shape – Part 1
- **2: Pairs memory test**
- 3: Fluid intelligence test
- 4: Reaction time (Snap) test
- 1: Prospective Memory test: Shape – Part 2

3.2: At the start of the test, the following text is shown:

“First, we'd like you to play 2 games of Pairs. In this section you will be shown a set of picture cards. Please try to remember as many of them as you can”

“The pictures will then be turned over. Please identify each pair of pictures by touching them on the screen. Please continue until all the pairs have been correctly identified. Press 'Next' for a short video demonstration”

3.3: The following text then appears:

“Touch the 'Back' button if you want to watch the instruction video again. The first game will have 3 pairs. When you're ready to begin, touch the 'Next' button”

The participant selects 'Next', then 3 pairs of matching symbol cards are displayed in a random pattern (Figure 1a). The symbols on cards were distinct; however no specific selection criteria were applied to choosing the designs. Participants are asked to memorise the position of as many matching pairs as possible during the 3 seconds that cards are shown. The cards are then turned face down on the screen (Figure 1b) and the participant is asked to touch as many pairs as possible in the fewest tries.

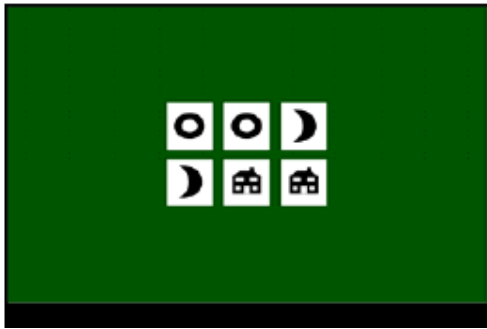


Figure 1a: Three pairs of matching symbol cards are displayed to participant for 3 seconds

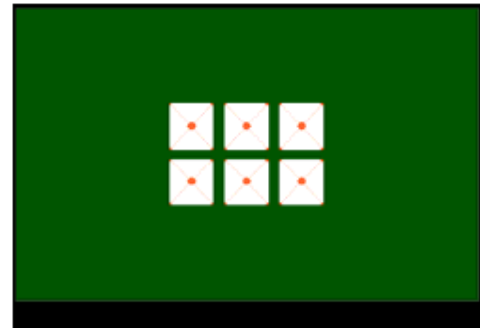


Figure 1b: The cards are turned face down.

3.4: After one game with 3 pairs, the following text appears:

“In the next section you will be shown 6 pairs of cards. Please identify the pairs again by touching the screen. Press ‘Next’ when you are ready to begin. This game will have 6 pairs of cards.”

3.5: The game is then repeated with a set of 12 cards (6 pairs). Cards in this round are shown for 5 seconds.

3.6: In the pilot phase an additional (i.e. third) round was conducted using 6 pairs of cards.

3.7: The process may be abandoned at any time using the ‘Abandon’ button. If the participant presses ‘Abandon’ they are presented with an ‘Are you sure?’ message. If they select ‘No’, they are returned to the current entry screen. If they select ‘Yes’ the participant then proceeds to the Fluid intelligence touch screen test.

3.8: The layout of cards was purely random in each round and there was no time restriction for the pair matching test, i.e. the participant was able to match/mismatch the pairs until all pairs were found or the ‘Abandon’ button was pressed.

4 Data Collection

The following data is captured and presented in the data showcase:

- Data-field 396/10133: **The number of columns in each round** (3 in the test with three pairs of cards; 4 in the test with six pairs of cards)
- Data-field 397/10134: **The number of rows in each round** (2 in the test with three pairs of cards; 3 in the test with six pairs of cards)
- Data-field 398/10136: **The number of correct matches in each round** (up to 3 in the test with three pairs of cards; up to 6 in the test with six pairs of cards)
- Data-field 399/10137: **The number of incorrect matches in each round**
- Data-field 400/10138: **Time taken to complete each round**