

# UK Biobank

## Touch-screen test of reaction time (Snap)

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Version 1.1

<http://www.ukbiobank.ac.uk/>  
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This manual details the procedure for the touch-screen test of Reaction Time (Snap) 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 test of reaction time (Snap) 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"> <li>• Welcome &amp; registration</li> <li>• Generating a USB key for Participants</li> </ul>
2	Touch screen Section	<ul style="list-style-type: none"> <li>• Consent</li> <li>• Touch screen questionnaire</li> <li>• Hearing Test</li> <li>• Cognitive function tests</li> </ul>
3	Interview & blood pressure	<ul style="list-style-type: none"> <li>• Interviewer questionnaire</li> <li>• Blood pressure measurement</li> <li>• Measurement of arterial stiffness (Pulse Wave Velocity)</li> </ul>
4	Eye measurements	<ul style="list-style-type: none"> <li>• Visual acuity</li> <li>• Refractometry</li> <li>• Intraocular pressure</li> <li>• Optical Coherence Tomography</li> </ul>
5	Physical measurements	<ul style="list-style-type: none"> <li>• Height (Standing and Sitting)</li> <li>• Hip &amp; Waist measurement</li> <li>• Weight and Bio-impedance measurement</li> <li>• Hand-grip strength</li> <li>• Ultrasound Bone Densitometry</li> <li>• Spirometry (Lung function test)</li> </ul>
6	Cardio (Physical fitness)	<ul style="list-style-type: none"> <li>• Exercise/ Fitness ECG test</li> </ul>
7	Sample collection & exit	<ul style="list-style-type: none"> <li>• Blood samples collected</li> <li>• Urine sample sought</li> <li>• Saliva sample sought</li> </ul>
8	Web-based diet questionnaire	<ul style="list-style-type: none"> <li>• Dietary assessment</li> </ul>

**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. Procedure for Snap test of reaction time

The Snap game is designed to test reaction time (i.e. simple processing speed) by pressing a button as soon as two identical cards are seen on the touchscreen.

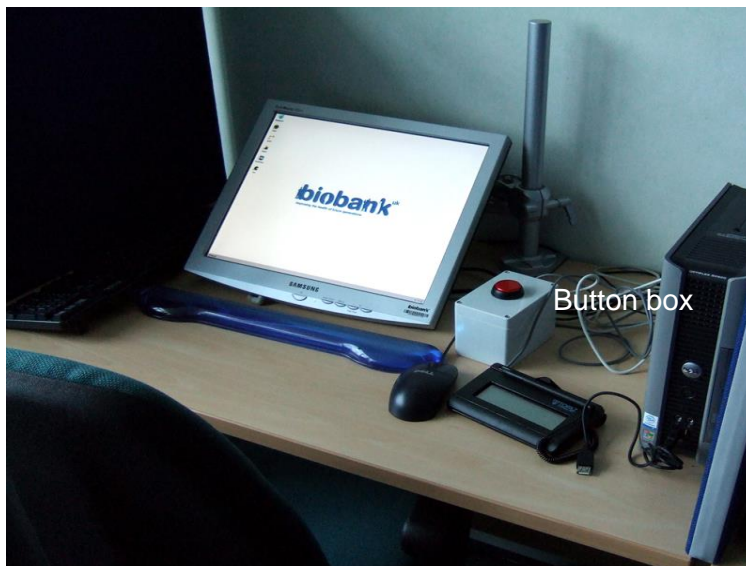
**3.1:** When the participant has completed the hearing test (or chosen not to do it), an on-screen message asks them to select 'Next' to begin the cognitive function tests.

**3.2:** During the main phase of recruitment, four cognitive function tests were performed in the following order:

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

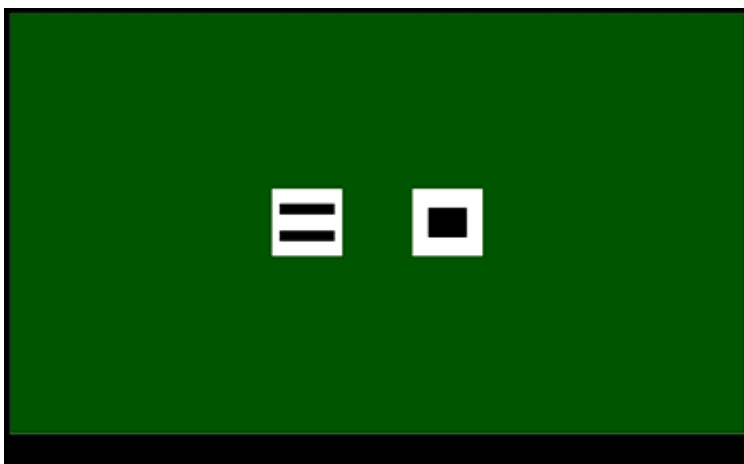
(Note: The **numeric memory test** was only performed in a subset of the participants and was phased out during the latter part of recruitment. The **lights pattern memory test** was performed in the pilot study and was not conducted during the main phase of recruitment.)

**3.3:** The Snap test is performed with the participant's dominant hand held ready over the button box (figure 1):



**Figure 1:** Button box at touch-screen station

**3.4:** Participants are shown two cards at a time on the touch-screen and instructed to press the button on the button box as quickly as possible when the symbols on the cards match. This exercise involves 12 pairs of cards. This test does not have an Abandon button.



**3.5:** When the Snap game is complete, the participant remains at the touch screen for the Prospective memory test: Shape – Part 2.

**3.6:** Once the participant has completed the cognitive function tests (or decides to skip this section) a message is displayed to contact a member of staff, who will then enter their name and password to complete this section of the visit.

## 4. Data Collection

**4.1:** The following data is stored:

- Index for card A in each round

- Index for card B in each round
- Number of times the Snap button was pressed in each round
- Time taken to first press the button in each round
- Mean time taken to correctly identify matches (this is a derived variables and is the mean time to press the button summed over rounds in which both cards matched)

#### 4.2: Further notes on the data:

- Following the pilot phase of recruitment (2006), the number of rounds of the Snap game was reduced from 20 to 12 in order to remove some redundancy (i.e. shorten the time taken to complete the test) while retaining important key data from the test. The data from the pilot and the main phase of recruitment are therefore presented separately.
- Some rounds appear to contain a very low number of data points due to these being rounds that did not include a match.
- It is advised that rounds 0-4 should be regarded as “training” rounds; as such, these were not included when calculating the overall mean reaction time.