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APPENDIX 1. RESULTS OF C.T. SCANS

Note: L = left , R = right.

SUBJECT J.Z.

11.6.91 Large R frontotemporal haematoma.

Large displaced R frontoparietal fracture with underlying cerebral contusion and small acute subdural haemorrhage.

Shear haemorrhage in internal capsule and top of thalamus.

Marked mass effect with midline shift to left and effacement of basal cisterns and 4th ventricle.

Depressed fracture of L zygoma with disruption of lateral wall of L maxilla, inferior orbital margin on left and L zygomatic arch.

Fracture of the base of skull crossing the middle cranial fossae bilaterally.

Disruption of vomer.

13.6.91 New large frontal and small L temporal subdural haemorrhages.

Shear haemorrhages increased in size, largest in R temporal lobe also in R internal capsule, L insula and R frontal lobe.

Midline shift largely resolved.

Basal cisterns and 4th ventricle visible.

SUBJECT F.G.

2.4.92 No abnormalities detected.

SUBJECT M.R.

7.12.92 Numerous foci contusions; frontal, parietal and temporal.

Intraventricular blood in posterior horn of L lateral ventricle.

9.12.92 Multiple areas of contusions and small haematoma in both hemispheres.

Small amount of blood in occipital horn of L lateral ventricle.

24.12.92 Well defined areas of low density both frontal lobes. Ventricles normal.

L tripod fracture. Fracture of base of skull.

SUBJECT M.P.

26.7.91 Multiple cerebral contusions

-L parietal lobe

-R basal ganglia

-L temporal lobe

-R internal capsule

-L thalamus

SUBJECT B.J.

9.6.91 L temporal and parietal contusion with hypodensity and brain swelling

Small isodense L parietal subdural haematoma

Compression of L lateral ventricle and minimal shift to Right

Generalised brain swelling and compression of 4th ventricle

11.6.91 Contusion slightly larger

Haemorrhage in foramen of Munro

28.6.91 R frontal pulsating mass

SUBJECT K.C.

20.2.92 Thin bilateral subdural haemorrhages.

Contusions of the corpus callosum and L putamen.

SUBJECT B.W.

26.12.92 Multiple white matter contusions.

SUBJECT P.R.

11.9.92 Multiple haemorrhagic contusions.

Diffuse R cerebral contusions particularly in the frontal and parietal lobes.

SUBJECT H.K.

12.7.93 No focal abnormalities.

13.7.93 No extradural collections

Suggestion of a small area of contusion over the vortex of the R parietal lobe.

23.7.93 Bilateral frontal chronic subdural haematoma.

27.7.93 Bilateral shallow fronto-parietal subdural collections persist. No significant changes in their size in past 4 days.

No evidence of fresh haemorrhage.

SUBJECT O.L.

27.12.91 R internal capsule haemorrhage.

27.12.91 (Repeat scan)

R parieto-temporal haematoma

Small R internal capsule haemorrhage

Small foci of haemorrhagi in both fronto-parietal regions

Blood on tentorium and against posterior aspect of R side of falx. (cont.)

30.12.91 R zyxgomatocomaxillary fractures

Medial displacement at lateral maxillary wall otherwise little displacement.

SUBJECT C.C.**21.1.94 R fronto-parietal extradural haemorrhage**

Fractured squamous temporal bone

22.1.94 No resolution of extradural haemorrhage**14.2.94 No evidence of significant extradural collection****SUBJECT E.A.****27.6.94 Multiple contusions, depressed skull fracture****3.7.94 R temporal depressed skull and underlying haemorrhagic contusions**

L basal ganglia haematoma

Significant surrounding oedema and mass effect with midline shift R

Generous CSF spaces of both frontal lobes

Small amount of blood in posterior horns of the lateral ventricles.

SUBJECT L.A.**15.9.94 Shearing injury of the brainstem**

Occipito-parietal skull fracture

Small amount of subarachnoid blood

NON GROUP SUBJECTS

SUBJECT M.A.

11.8.91 Generalised haemorrhages especially in parietal lobes

L periorbital haematoma

14.8.91 Bilateral parietal haemorrhages

R basal shadowing

SUBJECT N.B.

C.T. SCANS

24.3.94 Fracture of lateral wall of R orbit

Fractured roof of L orbit, fragments pushed posteriorly and laterally into

L frontal lobe

30.3.94 Small retro-orbital haematoma

M.R.I. SCAN

1.6.94 The long narrow path of the deep penetrating injury from above the left eye to the R thalamus is well demonstrated with a small amount of surrounding haemosiderine. There is a small intracranial bone fragment at the entry point through the floor of the L anterior cranial fossa. The path of the injury passes through the inferior L frontal lobe, head of the caudate nucleus inferiorly, genu of the internal capsule adjacent to the

fornix anteriorly, third ventricle and R thalamus. There may also be a shorter second path a little more superiorly in the L frontal lobe.

APPENDIX 2. MEDICATION

SUBJECT J.Z.

Medication:

Carbomazopene (Anti-convulsant)	11.7.91 - 16.7.91
Dilantin (Anti-convulsant)	17.7.91 - 29.7.91
Chloropromazine (Anti-psychotic)	10.7.91 - 23.7.91

This patient was on medication while taking part in the first 3 test occasions of the study.

SUBJECT M.P.

Dilantin (Anti-convulsant)	28.8.91 - 28.9.91
Tegretol (Anti-convulsant)	9.8.91 - 9.1.92

This subject was taking Tegretol for the entire period during which testing was taking place. However, Dilantin was only being administered at the time of the first occasion of testing.

SUBJECT F.G.

Melleril (Anti-psychotic)	21.4.92 - 12.5.92
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This patient was taking medication during the period of the first three test occasions.

SUBJECT K.C.

Tegretol (Anti-convulsant)	29.4.92 - 10.6.92
Melloril (Anti-psychotic)	6.4.92 - 6.5.92
Neulactil (Anti-psychotic)	6.5.92 - 2.7.92

Tegretol was taken up until 8 days prior to Test Occasion 2.
 Melloril was ceased 12 days before Test Occasion 1.
 Neulactil was taken during the period of the first two test occasions.

SUBJECT P.R.

Rivotril (Anti-convulsant)	6.1.94 - 7.2.94
Temazepam (Sedative)	6.1.94 - 13.2.94
Indocid (Anti-inflammatory)	8.1.94 - 13.3.94

This subject was taking medication during the entire period of the study.

SUBJECT H.K.

Temazepan (Anti-convulsant)	16.8.93 - 22.8.93
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Administration of Temazepan was ceased 3 days prior to Test Occasion 1, therefore, it would be expected that there would be no traces of the drug in his system at the time of the first test occasion.

NON GROUP SUBJECTS

SUBJECT M.A.

Dilantin (Anti-convulsant)

27.8.91 - 14.9.91

Medication was being administered during the entire testing period.

9 of the 15 subjects were not taking any medication while they were participating in this study.

APPENDIX 3. P.T.A. SCALE (Adapted from Artiola i Fortuny et al, 1980)

- Q 1(a) Have you seen me before ?
(b) Do you remember my name ?
- Q 2. When is your birthday ?
- Q 3. How old are you ?
- Q 4. What year is it now ?
- Q 5. What month is it now ?
- Q 6. What day of the week is it ?
- Q 7. What time is it - is it morning, afternoon or night ?
- Q 8. What is the name of this place ?
- Q 9. Which city are we in ?
- Q 10. Yesterday I showed you 3 pictures and asked you to remember them.
Can you tell me what the pictures were ?

APPENDIX 4. RESOLUTION OF P.T.A

SUBJECT J.Z.

Date of injury : 10.6.91

Order of recall

(1) Pictures - recognition	17.7.91 (5 days from first exposure)
- free recall	19.7.91
(2) Year	18.7.91
(3) Month	19.7.91
(4) Name of therapist	23.7.91
(5) Place	25.7.91
Day	25.7.91
Time of day	25.7.91

(Date of birth and age were always correct)

SUBJECT B.J.

Date of injury : 9.6.91

Order of recall:

(1) Age	14.8.91
Place	14.8.91
(2) Pictures - recognition	21.8.91 (11 days after first exposure)
(3) Name of therapist	27.8.91
(4) Time of day	2.9.91
(5) Month	12.9.91
(6) Year	13.9.91

SUBJECT B.J. (cont.)

(7) Day 17.9.91

(Date of birth was always correct)

SUBJECT M.P.

Date of injury : 26.7.91

Order of recall:

(1) Place	14.9.91
(2) Age	23.9.91
(3) 3 Pictures - recognition	28.9.91 (11 days after first exposure)
- free recall	10.10.91 (achieved for only 2 pictures)
(4) Month	3.10.91
Name of therapist	3.10.91
(5) Year	8.10.91
(6) Day/ Time of day	10.10.91

(Date of birth was always correct)

SUBJECT O.L.

Date of injury : 27.12.91

Order of recall:

(1) Place	27.2.92
(Name of hospital only)	
(2) 3 Pictures - recognition	29.2.92 (9 days after first exposure)
Name of therapist	29.2.92

SUBJECT O.L. (cont.)

(3) Year	9.3.92
(4) Time of day	20.3.92
(5) Month	25.3.92
Age	25.3.92
(6) Place (City)	1.4.92
(7) Day	2.4.92

(Date of birth was always correct)

* Although this subject recalled the name of the hospital correctly at an early stage, his recall of which city he was in fluctuated for some weeks afterwards. He often believed himself to be in the region where his accident had occurred and to which he had been a frequent visitor prior to the accident.

SUBJECT F.G.

Date of injury : 2.4.92

Order of Recall :

(1) Pictures - recognition	27.4.92 (5 days after first exposure)
- free recall	3.5.92
Year	27.4.92
(2) Place/Time of day	28.4.92
(3) Age	29.4.92
(3) Name of therapist	30.4.92
(4) Day	2.5.92
(5) Month	4.5.92

SUBJECT K.C.**Date of injury :** 20.2.92**Order of Recall:**

- | | |
|----------------------------|--|
| (1) Date of birth | 28.5.92 |
| (2) Age | 15.6.92 |
| (3) Name of therapist | 17.6.92 |
| (4) Pictures - recognition | 18.6.92 (35 days after first exposure) |
| (5) Place | 19.6.92 |
| (6) Day | 25.6.92 |
| (7) Year | 26.6.92 |
| (8) Time of day | 29.6.92 |
| (9) Month | 3.7.92 |

SUBJECT M.R.**Date of injury :** 7.12.92**Order of Recall:**

- | | |
|----------------------------|---------------------------------------|
| (1) Pictures - recognition | 31.1.92 (7 days after first exposure) |
| - free recall | 11.2.93 |
| (2) Month | 2.2.93 |
| Date of birth | 2.2.93 |
| (3) Time of day | 8.2.93 |
| (4) Place | 9.2.93 |
| (5) Age | 10.2.93 |
| (6) Name of therapist | 11.2.93 |

SUBJECT M.R. (cont.)

(7) Year	12.2.93
(8) Day of week	17.2.93

SUBJECT B.W.

Date of injury: 26.12.92

Order of recall:

(1) Month	2.3.93
(2) Age	3.3.93
(3) Time of day	4.3.93
Name of therapist	4.3.93
(4) 3 Pictures - recognition	5.3.93 (8 days after first exposure)
(5) Place	15.3.93
Year	15.3.93
(6) Day	17.3.93

(Date of birth was always correct)

SUBJECT H.K.

Date of injury : 12.7.93

Order of recall:

(1) Year	1.9.93
(2) Place	3.9.93
Day	3.9.93

SUBJECT H.K. (cont.)

Time of day	3.9.93
Pictures - recognition	3.9.93 (10 days after first exposure)
(3) Name of therapist	5.9.93
Age	5.9.93
(4) Month	6.9.93
(Date of birth was always correct)	

SUBJECT P.R.

Date of injury : 11.9.93

Order of recall:

(1) Pictures - recognition	18.1.94 (12 days after first exposure)
- free recall	4.2.94
(2) Date of birth	24.1.94
(3) Day	27.1.94
Month	27.1.94
Time of day	27.1.94
(4) Place	31.1.94
(5) Name of therapist	1.2.94
(6) Year	2.2.94
Age	2.2.94

SUBJECT C.C.**Date of injury : 21.1.94****Order of recall :**

- | | | |
|------------------------------|---------|--------------------------------|
| (1) Year | 19.2.94 | |
| (2) 3 Pictures - recognition | 21.2.94 | (10 days after first exposure) |
| Time of day | 21.2.94 | |
| (3) Name of therapist | 23.2.94 | |
| (4) Place | 24.2.94 | |
| (5) Month | 4.3.94 | |

(Date of birth and age were always correct)

SUBJECT E.A.**Date of injury : 27.6.94****Order of recall :**

- | | | |
|----------------------------|---------|-------------------------------|
| (1) Pictures - recognition | 20.8.94 | (7 days after first exposure) |
| (2) Name of therapist | 25.8.94 | |
| (3) Year | 27.8.94 | |
| (4) Place | 14.9.94 | |
| (5) Day | 30.9.94 | |
| Time of day | 30.9.94 | |
| (6) Month | 4.10.94 | |

SUBJECT L.A.**Date of injury : 15.9.94****Order of recall:**

- | | | |
|--------------------------------------|----------|-------------------------------|
| (1) Recall of pictures - recognition | 15.10.94 | (3 days after first exposure) |
| - free recall | 1.11.94 | |
| (2) Hospital | 17.10.94 | |
| (3) Name of therapist | 25.10.94 | |
| (4) Time of day | 2.11.94 | |
| (5) Age*/Month/Year | 12.11.94 | |

(Date of birth and city were always correct)

* Constantly gave age as 27 instead of 26 years. When I queried this and asked him whether he meant 27 last birthday or next birthday he stated that he was 27 years old on his last birthday. It was not until he was emerging from PTA that he was able to give his correct age.

NON-GROUP SUBJECTS**SUBJECT M.A.****Date of injury : 11.8.91****Order of recall :**

- | | |
|------------------------------|--------------------------------------|
| (1) Day | 30.8.91 |
| Time of day | 30.8.91 |
| (2) 3 Pictures - recognition | 2.9.91 (7 days after first exposure) |
| Year | 2.9.91 |

SUBJECT M.A. (cont.)

(3) Place	3.9.91
Month	3.9.91
Name of therapist	3.9.91

SUBJECT N.B.**Date of injury :** 24.3.94**Order of recall :**

(1) Place *	12.5.94
Year	12.5.94
(2) 3 Pictures - recognition	21.5.94 (9 days after first exposure)
(3) Time of day	24.5.94
(4) Name of therapist	10.6.94
(5) Month	15.6.94
Lidcombe*	15.6.94

* The subject was aware that she was in a hospital in Sydney on the date of admission to Lidcombe (10.5.94) but because of her severe amnesia, due to the penetrating injury, found it difficult to remember the name of the hospital and fluctuated between giving the name of Lidcombe and the name of the hospital she was in for her acute care. She did not achieve consistency for the name until 15.6.94 neither did she achieve orientation for the day of the week. To have continued to assess her daily in an attempt to see whether it was possible for her to become oriented for the day of the week would have distressed her unnecessarily. She remembered that she was being asked a series of questions each day and on several

occasions stated that she felt stupid because she couldn't remember things. therefore I decided to cease the daily questioning once she was scoring 11 out of 12 consistently.

APPENDIX 5. Attention and Memory - performance across the 4 Test Occasions

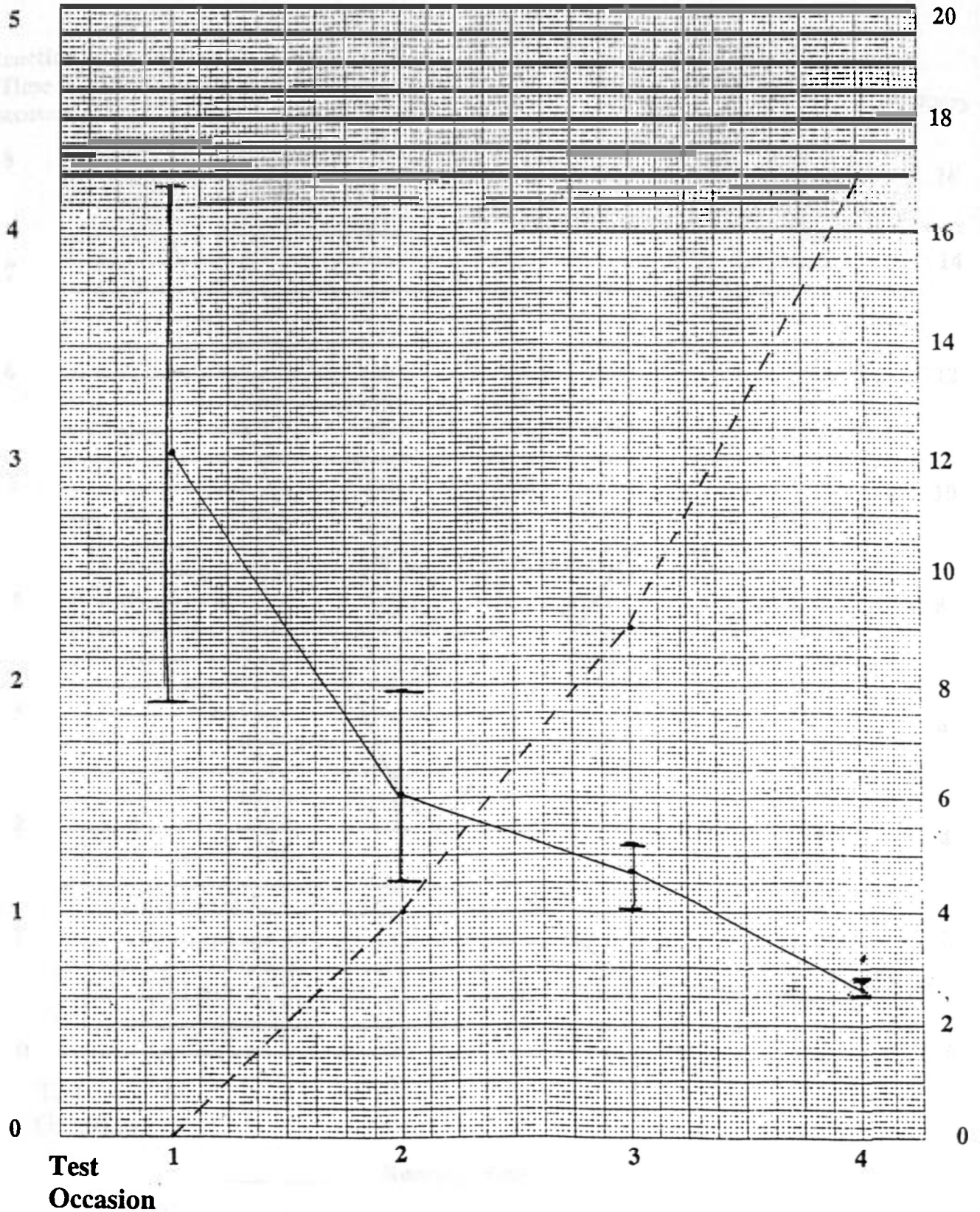
For each subject, and for the total group of 13 subjects, reaction times and memory scores have been plotted on graphs on pages A 22 to A36, to illustrate the interaction between attention and memory on each of the four test occasions. Ninety five percent confidence intervals have been calculated for reaction times to illustrate the variability of the subject's performance.

The memory score is the Standardised Profile Score as described in the manual of the Rivermead Behavioural Memory Test. As raw scores vary from one subtest to another some components would receive a heavier weighting than others if the raw scores were added together. Thus, the Standardised score equates the importance of each subtest.

SUBJECT: J.Z.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memory



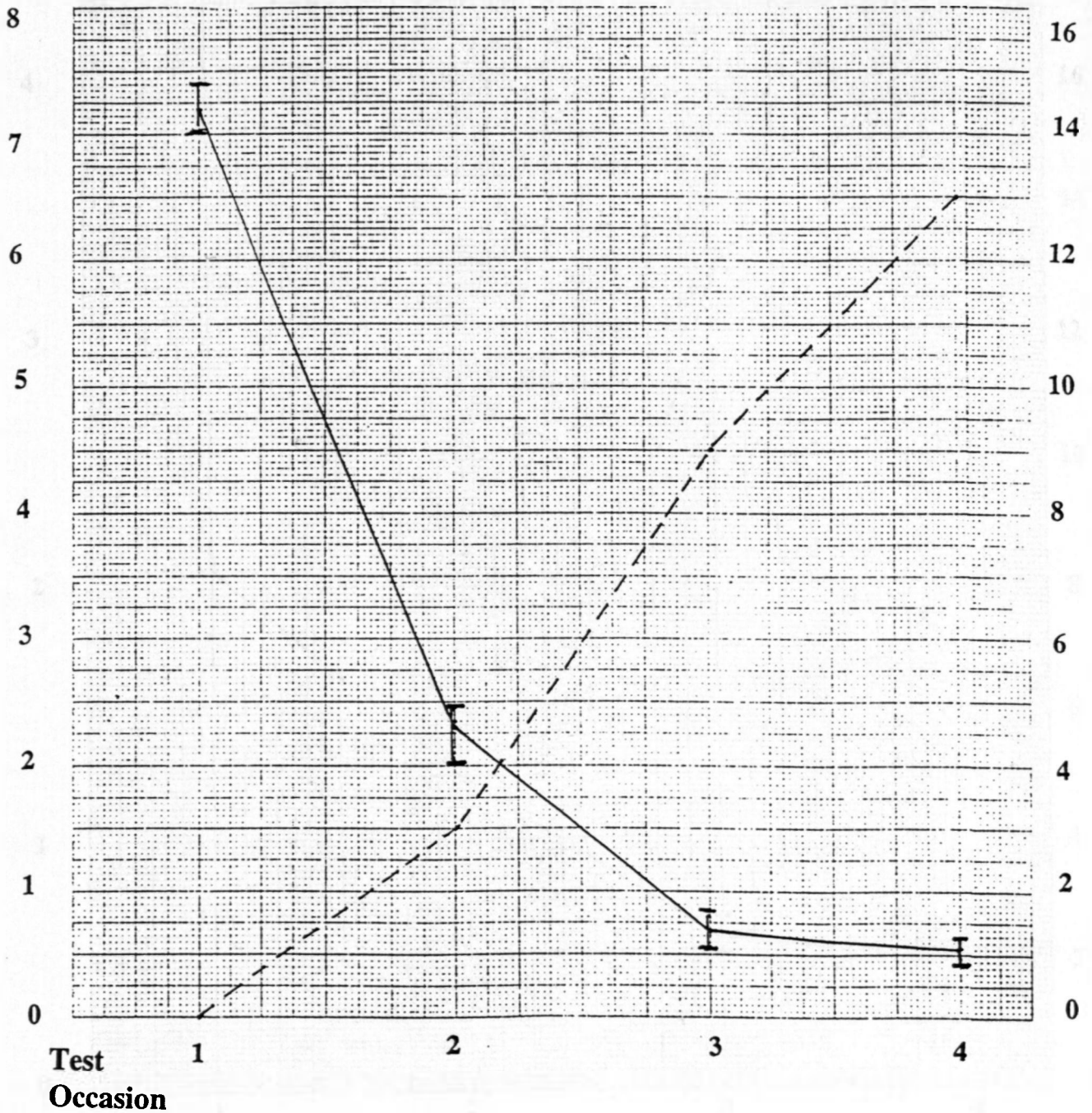
Reaction Time

Memory Score

SUBJECT: F. G.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memory



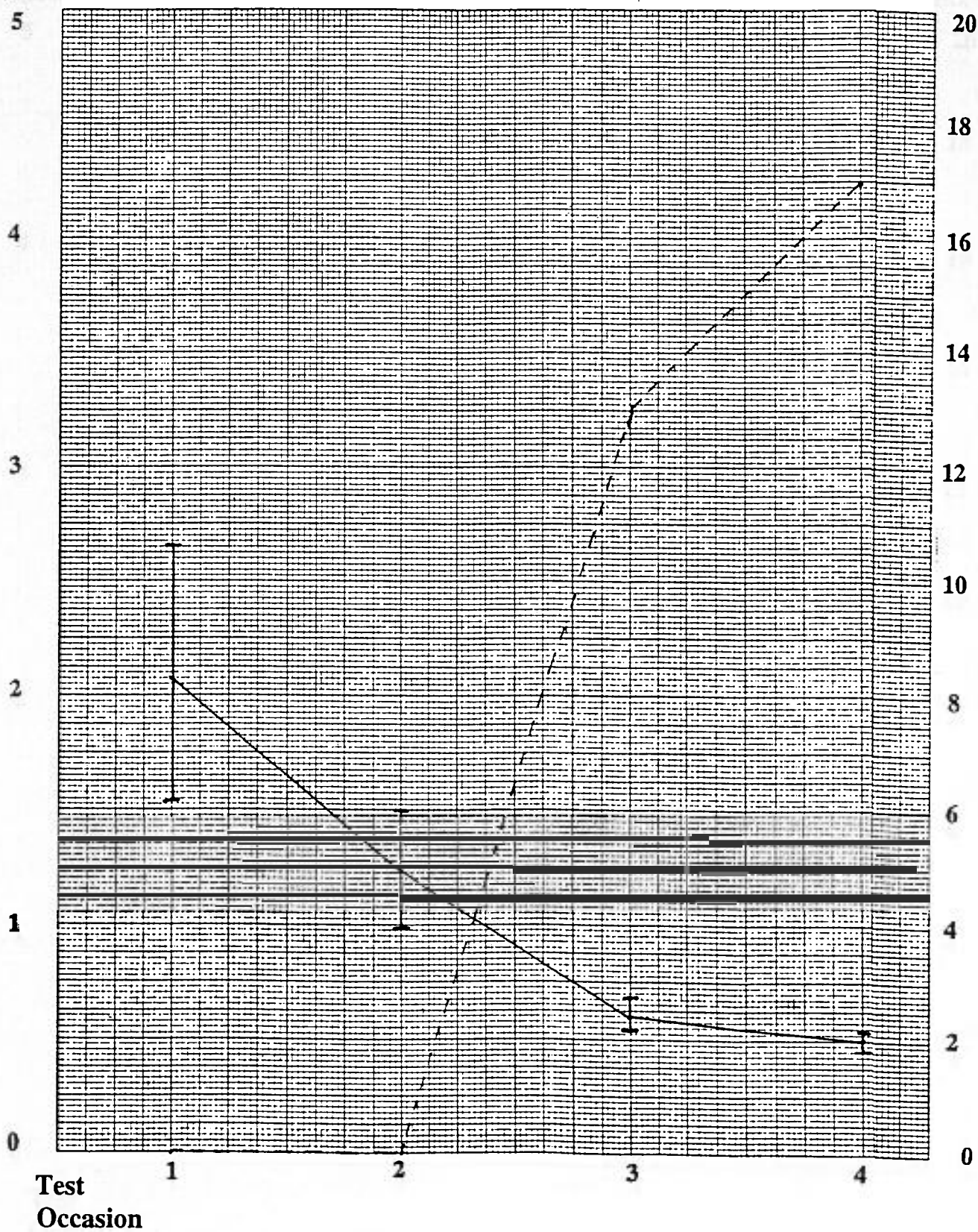
_____ Reaction Time

_____ Memory Score

SUBJECT: M. R.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memor



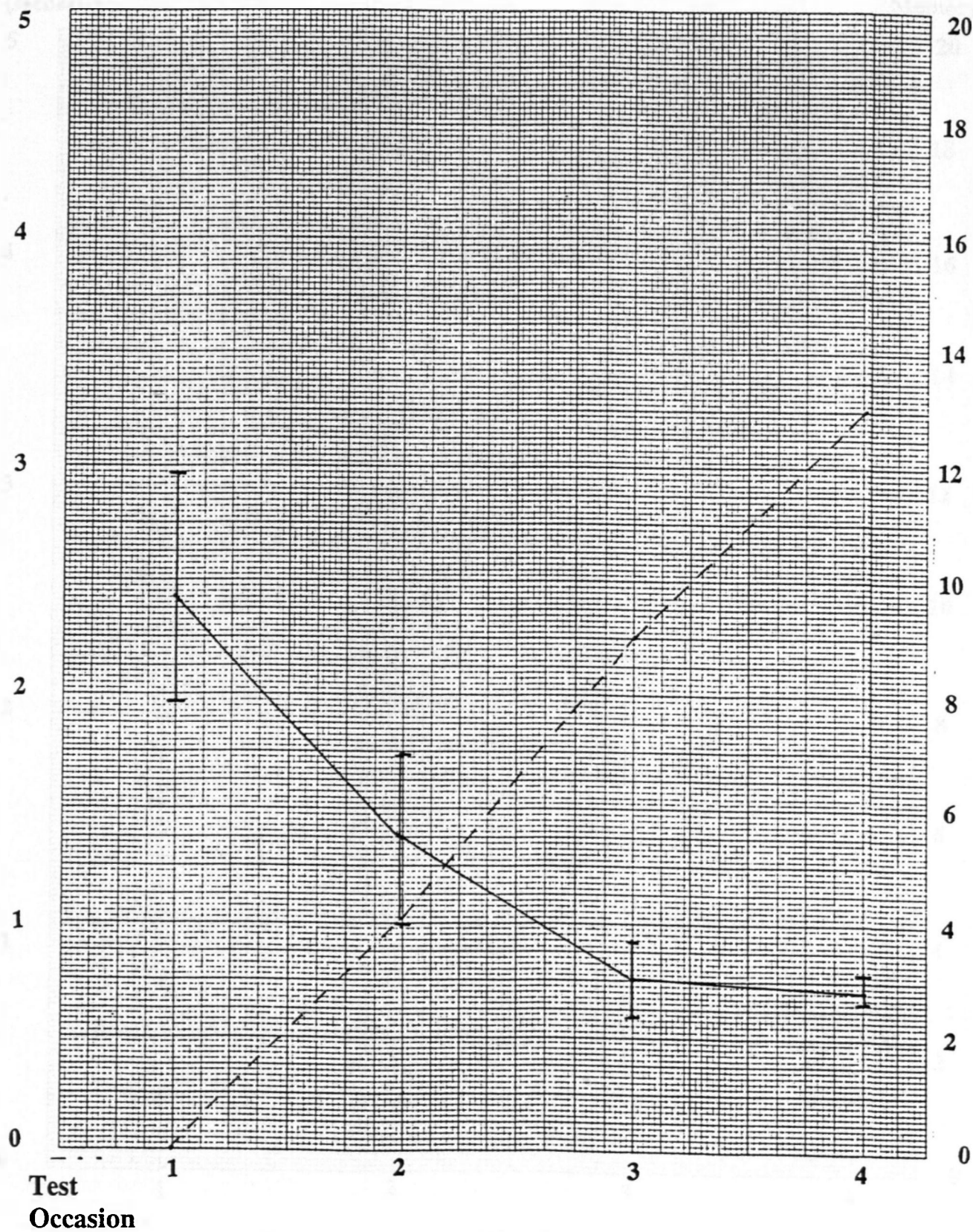
Reaction Time

Memory Score

SUBJECT: M.P.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memor



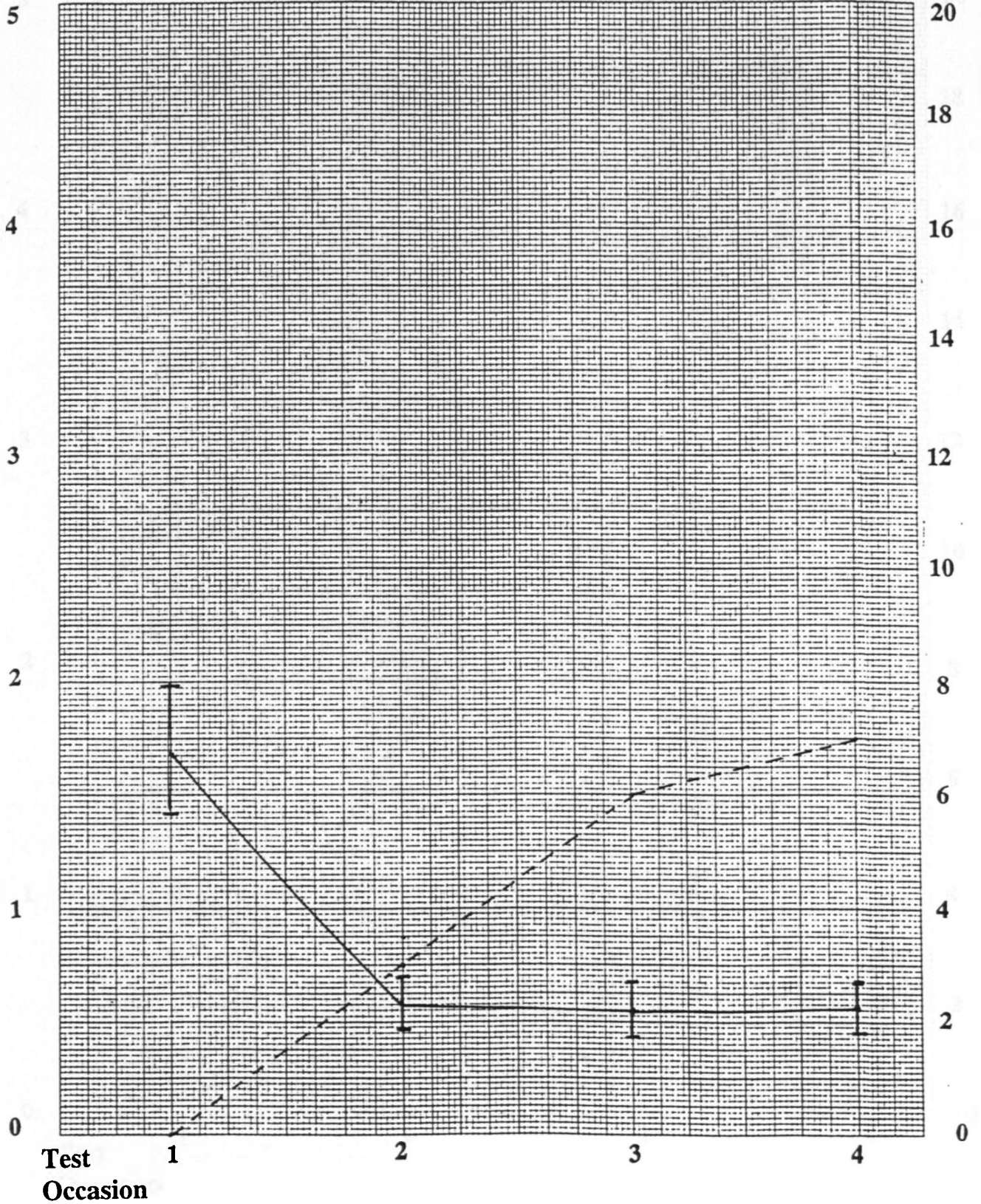
Reaction Time

Memory Score

SUBJECT: K.C.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memory



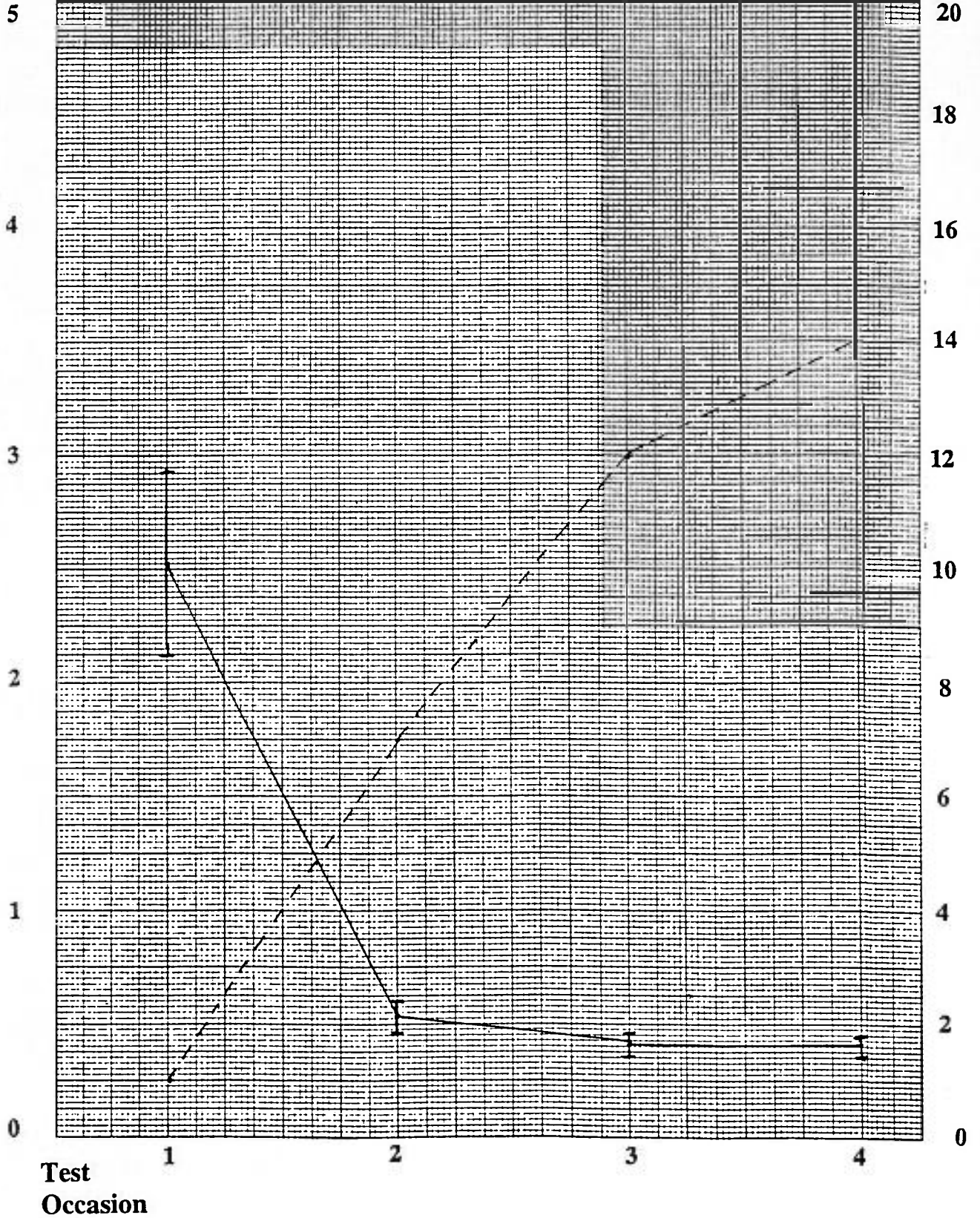
Reaction Time

Memory Score

SUBJECT: B.W.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memory



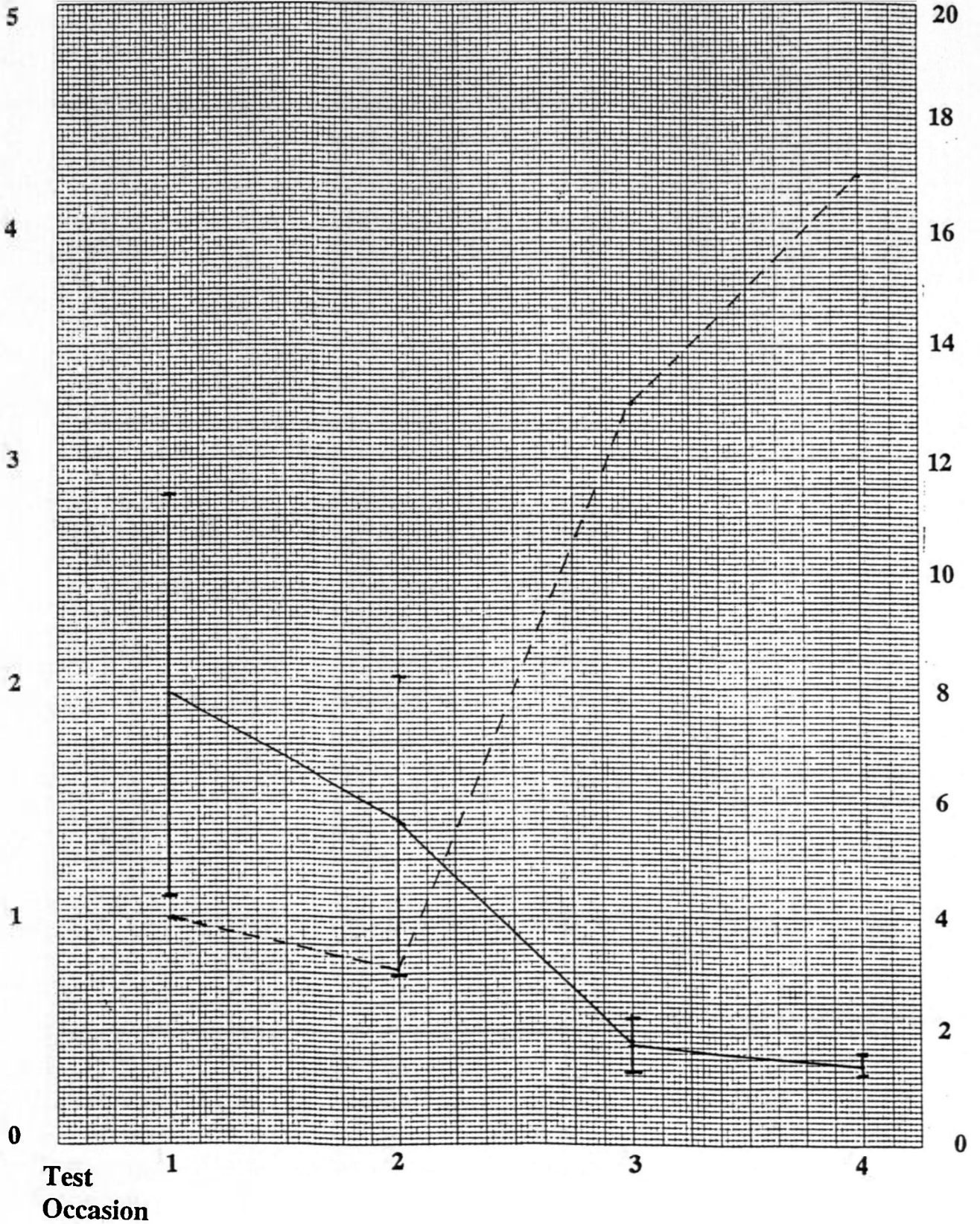
Reaction Time

Memory Score

SUBJECT: P.R.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memory



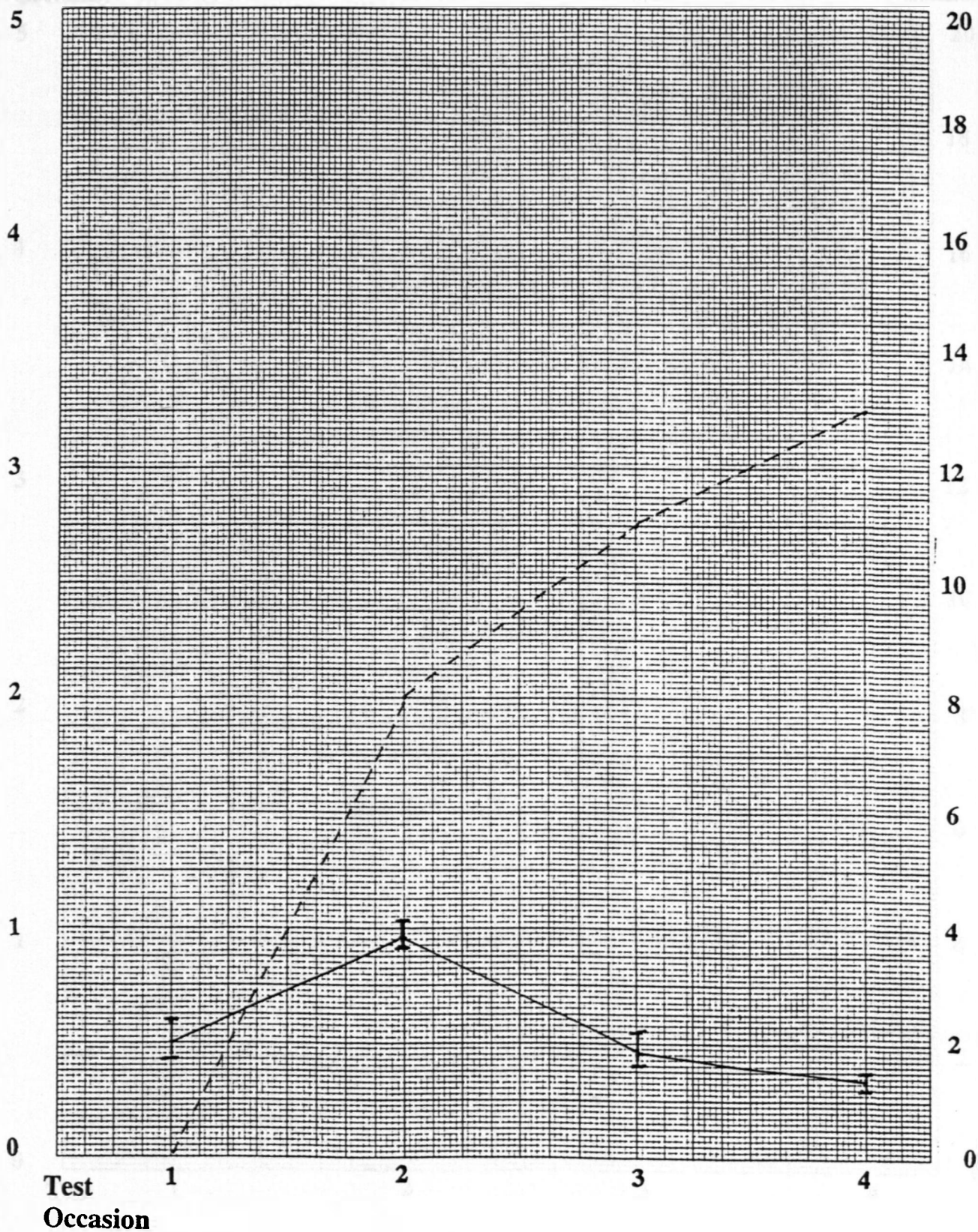
Reaction Time

Memory Score

SUBJECT: H.K.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memory



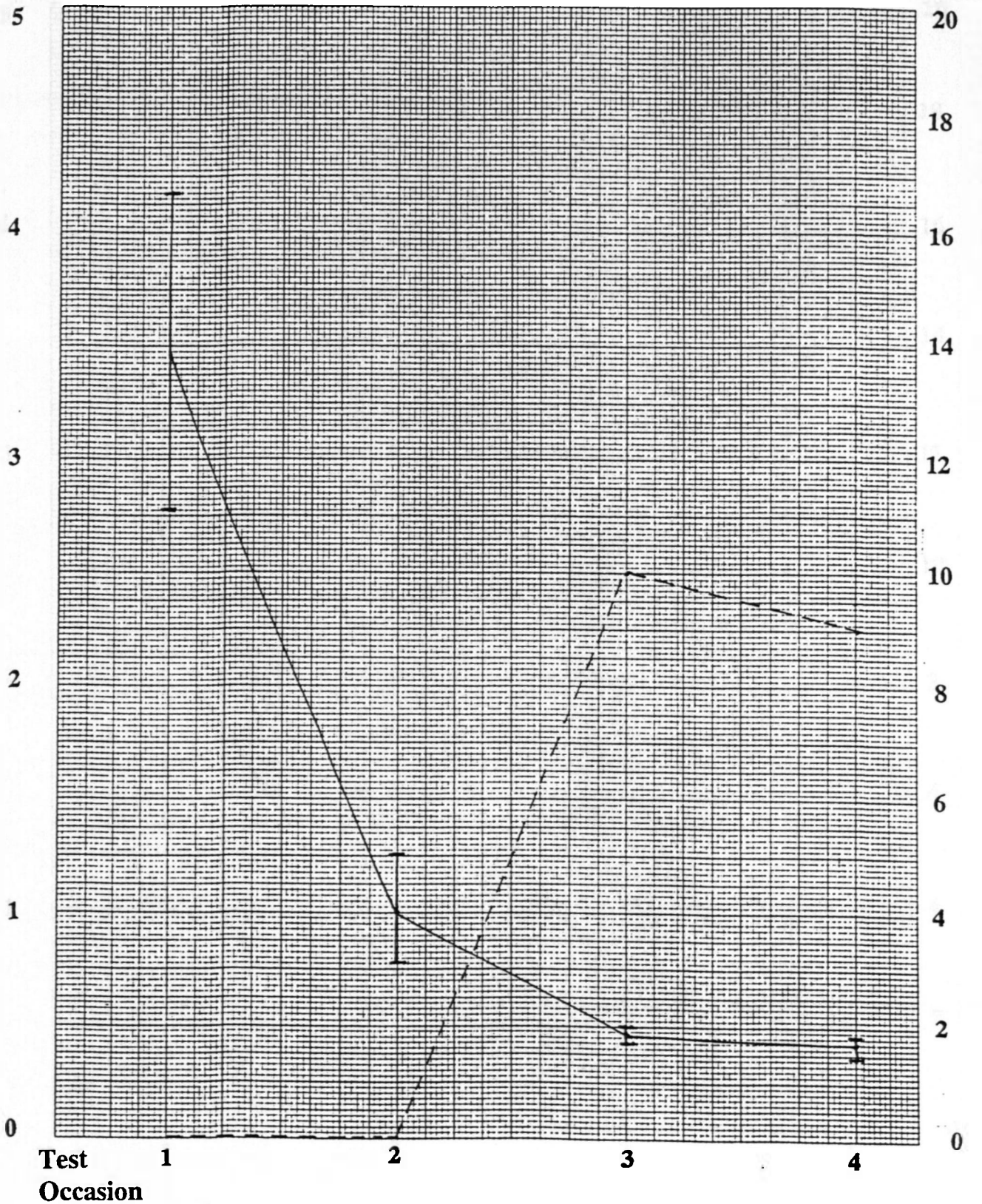
Reaction Time

Memory Score

SUBJECT: O.L.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memory



Reaction Time

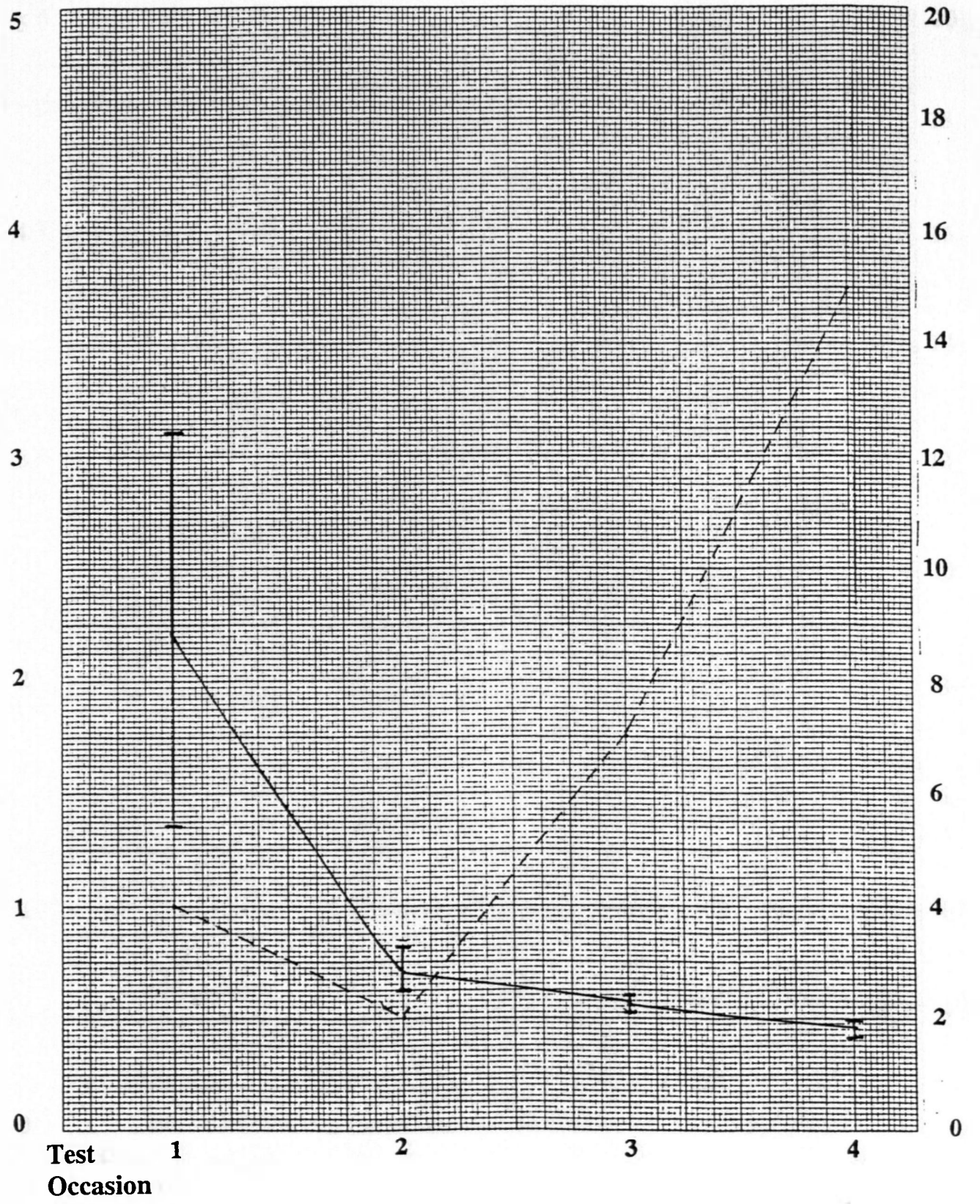
Memory Score

SUBJECT: C.C.

REACTION TIME AND MEMORY TASKS

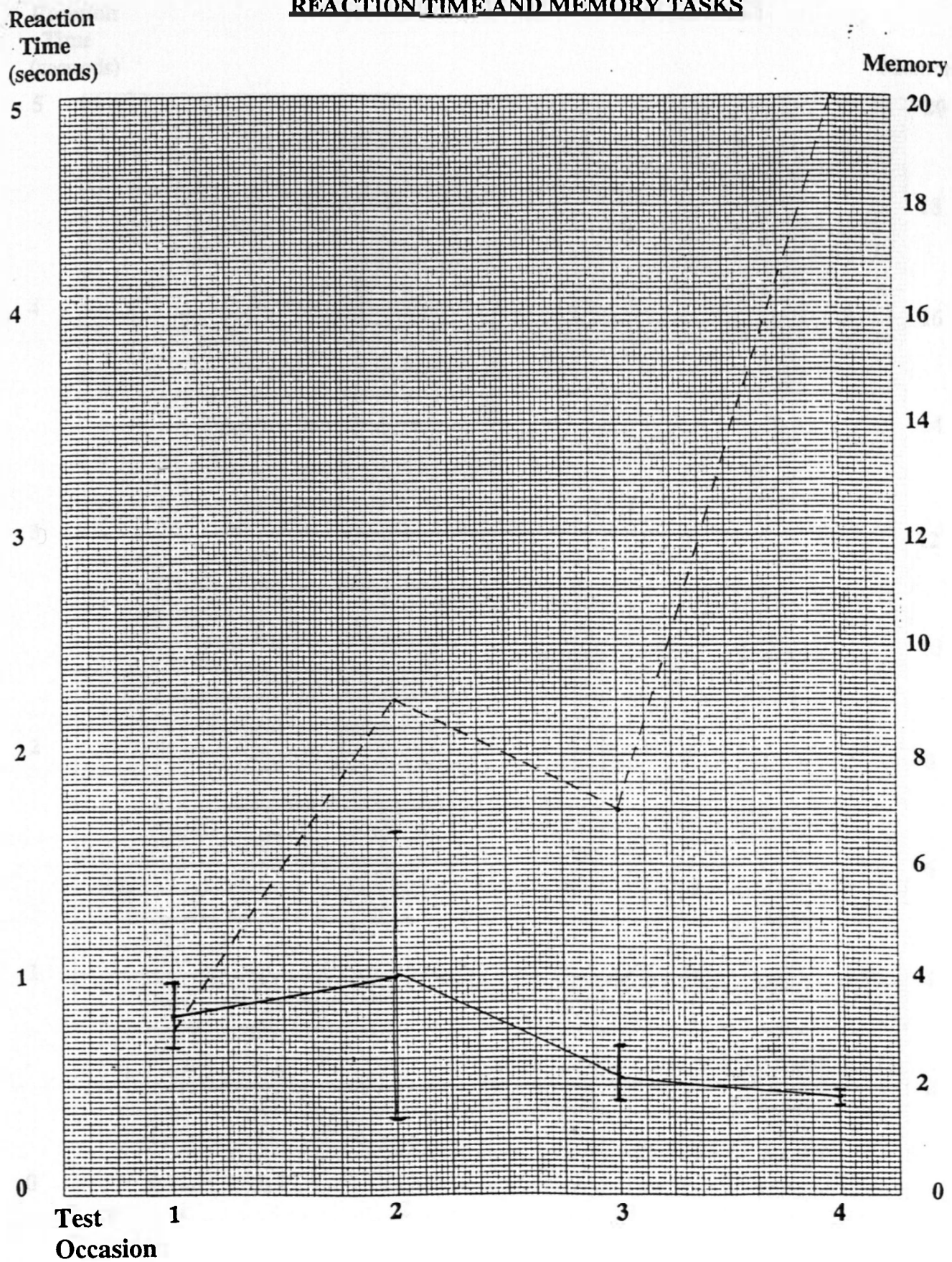
Reaction
Time
(seconds)

Memory



_____ Reaction Time
_____ Memory Score

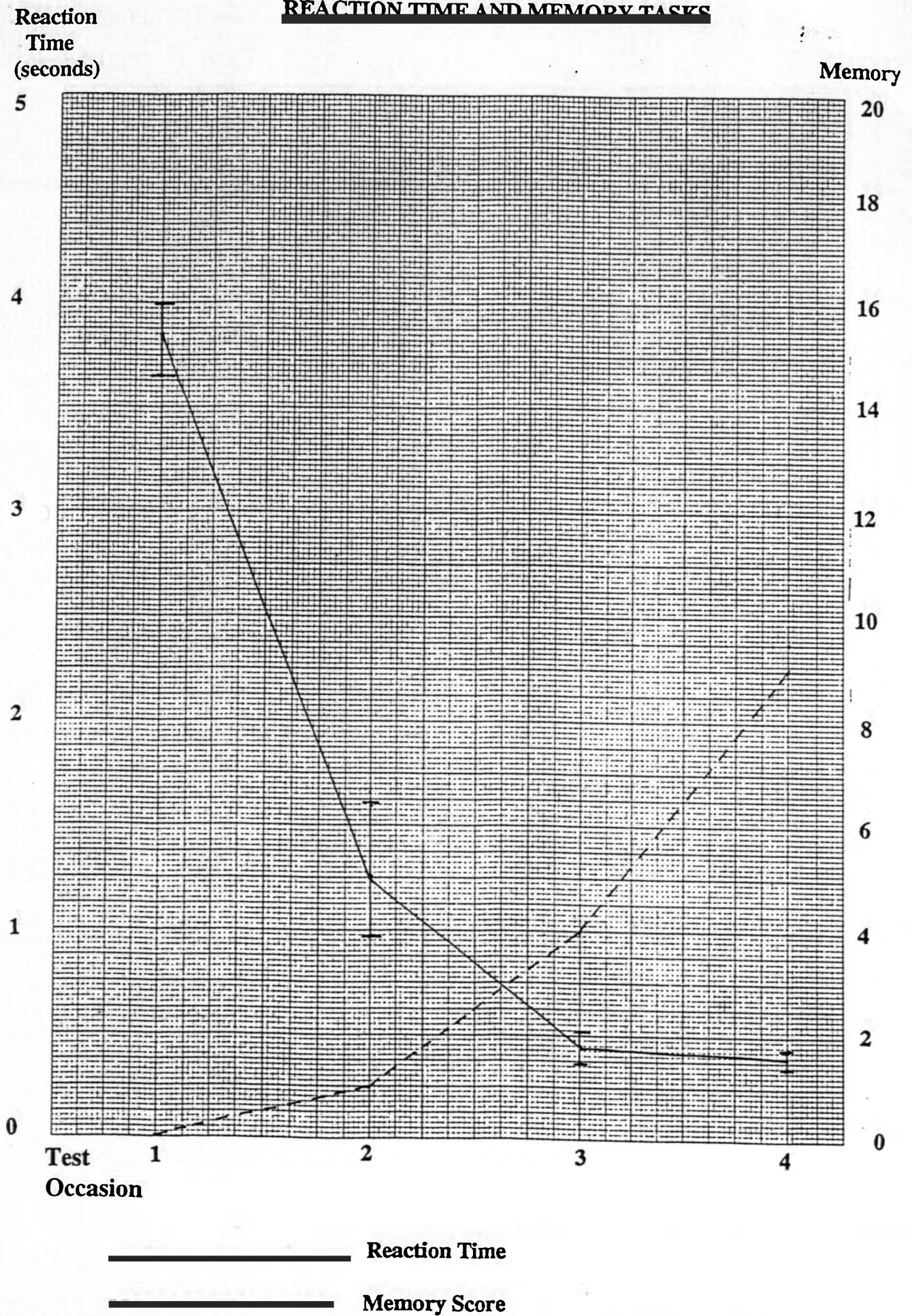
SUBJECT: B. J.

REACTION TIME AND MEMORY TASKS

Reaction Time

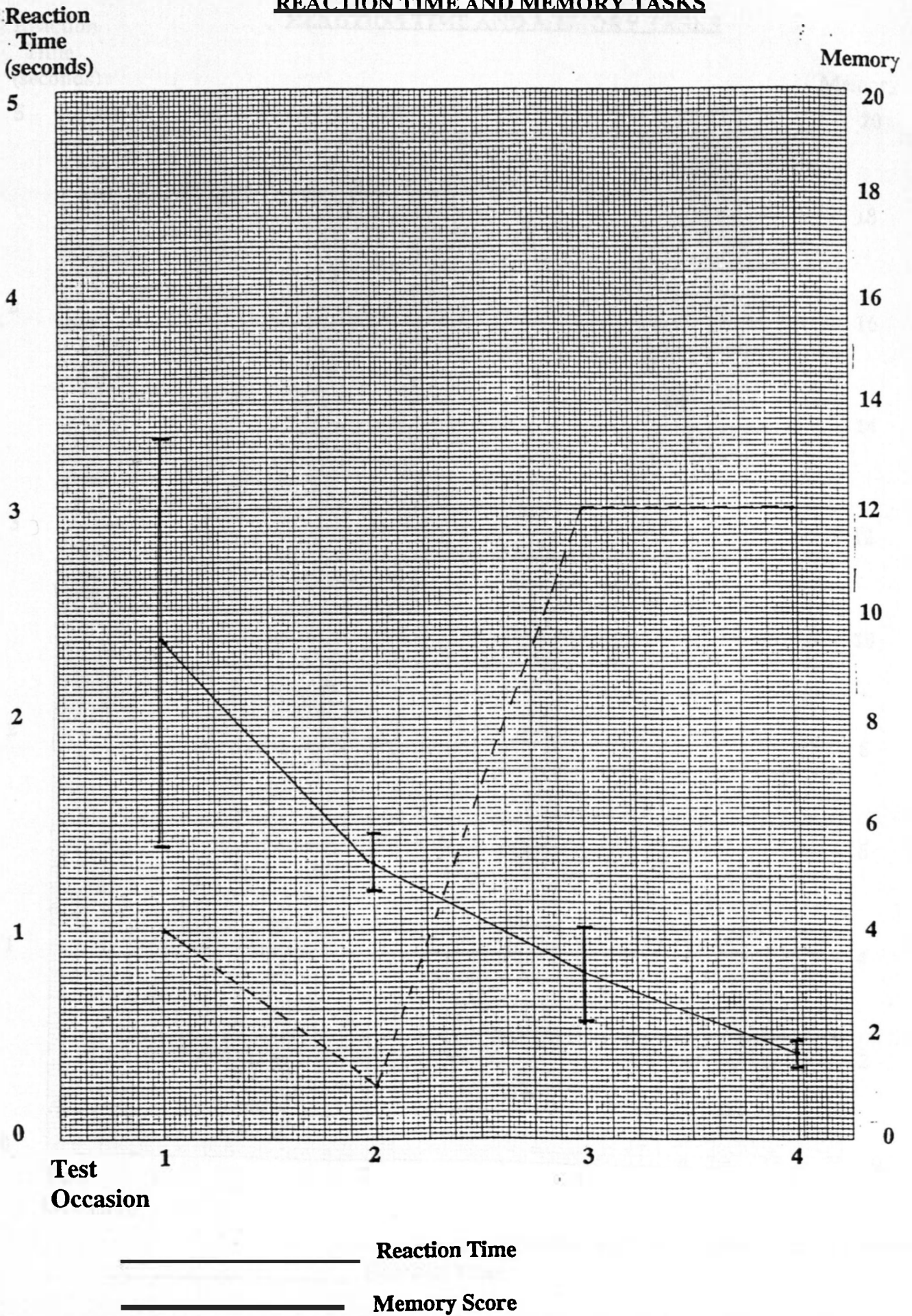
Memory Score

SUBJECT: E. A.

REACTION TIME AND MEMORY TASKS

SUBJECT: L.A.

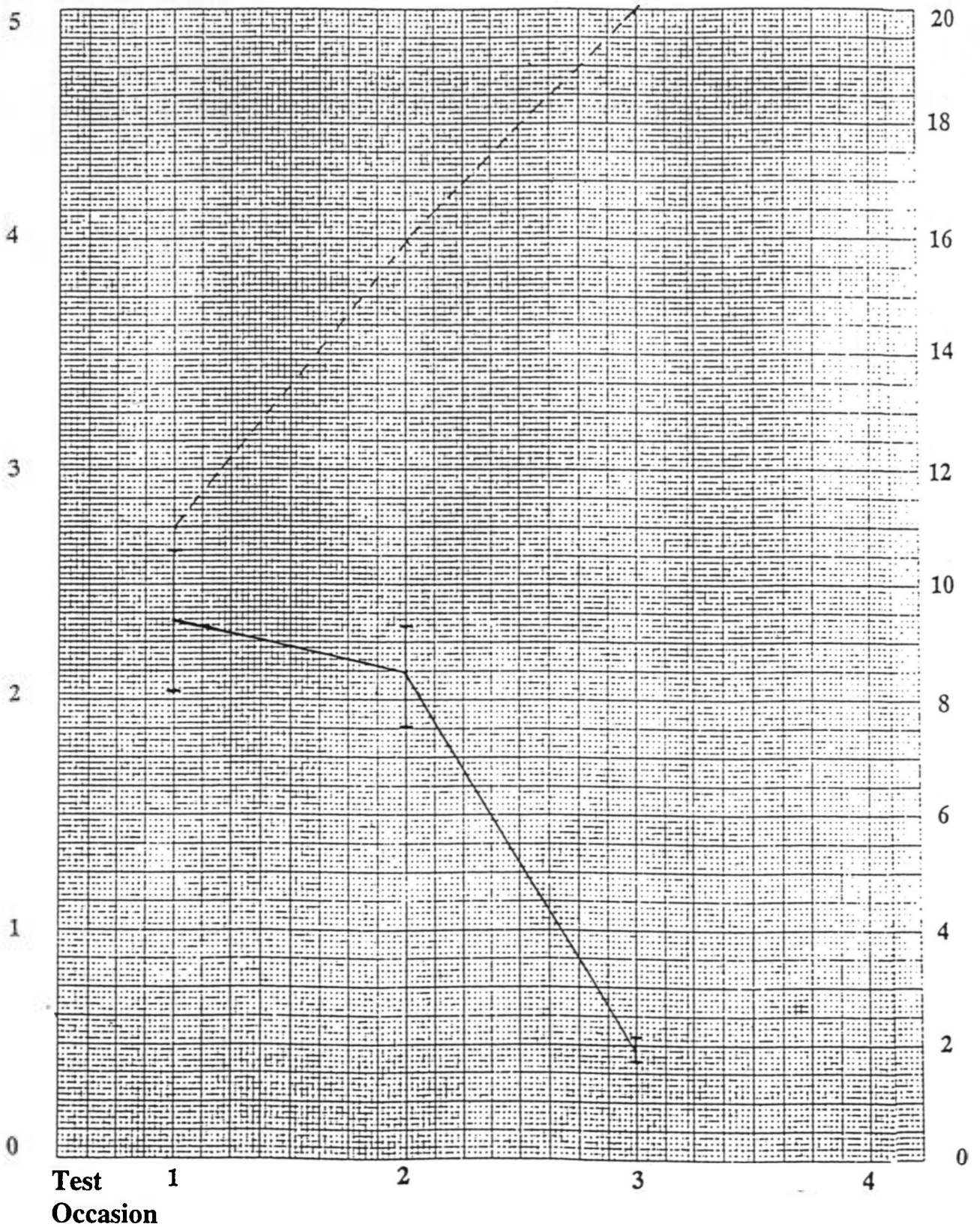
REACTION TIME AND MEMORY TASKS



SUBJECT: M. A.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memory



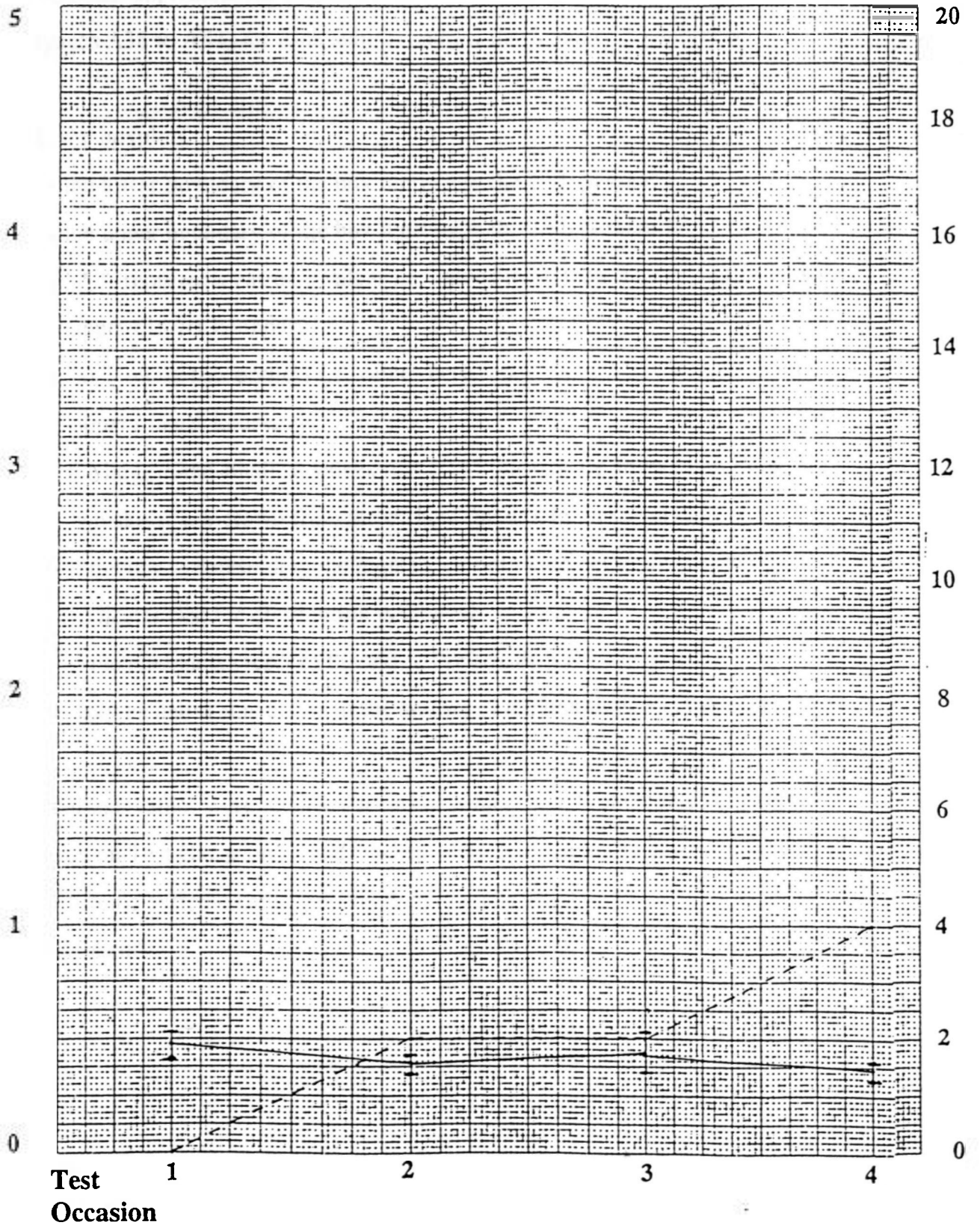
Reaction Time

Memory Score

SUBJECT: N.B.

REACTION TIME AND MEMORY TASKSReaction
Time
(seconds)

Memory



Reaction Time

Memory Score

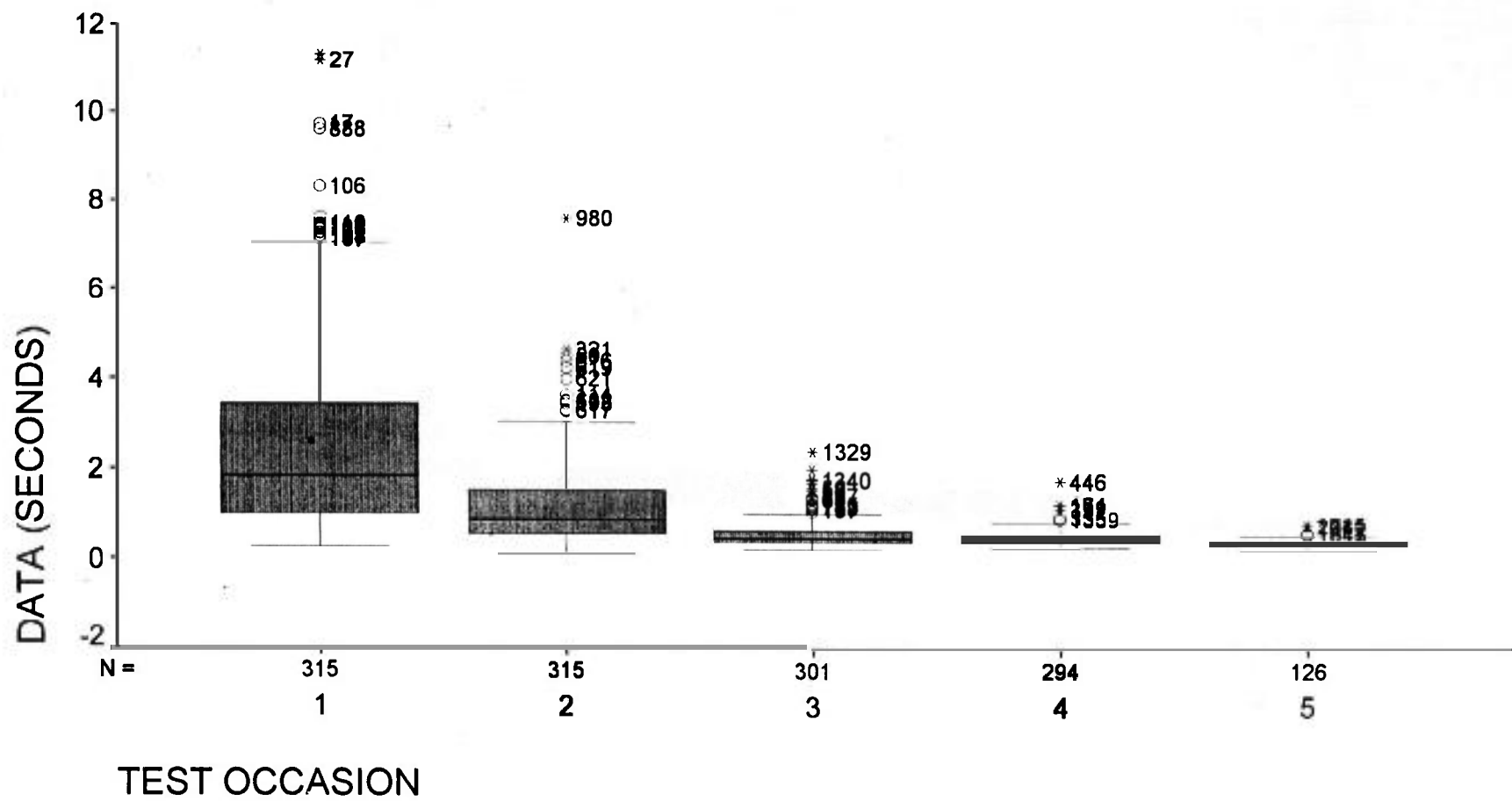
APPENDIX 6. BOXPLOTS

To better appreciate the shapes of the distribution, boxplots have been drawn (pages A38 to A54) for each subject and for the group of 13 subjects.

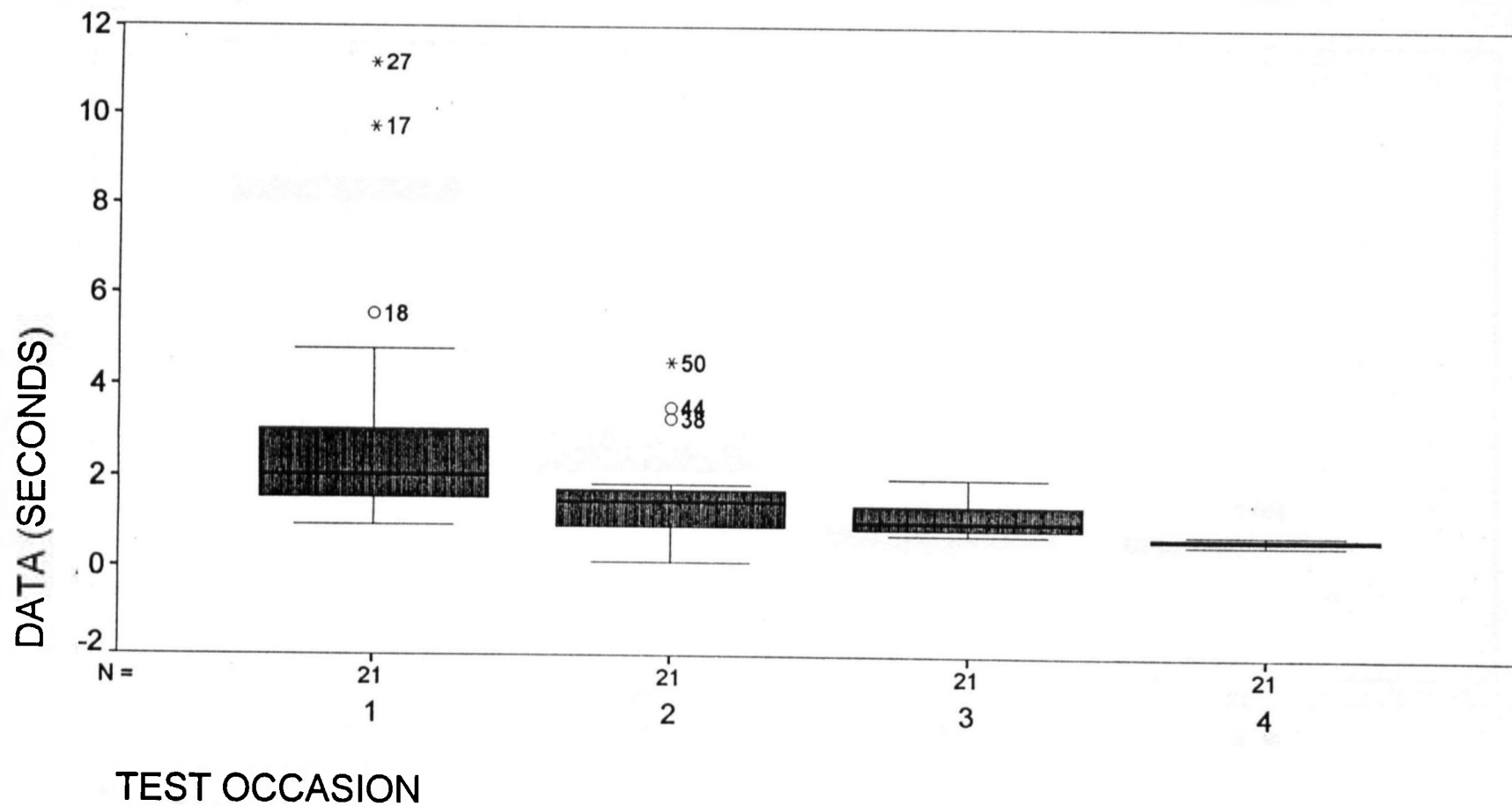
In the boxplots :

- the lower boundary of the box represents the 25th percentile
- the upper boundary of the box represents the 75th percentile
- " * " represents extreme values i.e. values more than 3 box lengths from the upper / lower boundary
- " o " represents outliers i.e. values between 1.5 and 3 box lengths from the upper / lower boundary
- the largest and smallest values that aren't outliers are shown and lines, or 'whiskers', are drawn from the ends of the box to these values
- if the line, representing the median, is not in the centre of the box this indicates that the distribution is skewed
- if the median is closer to the top of the box then the distribution is positively skewed and if it is closer to the bottom of the box then it is negatively skewed.

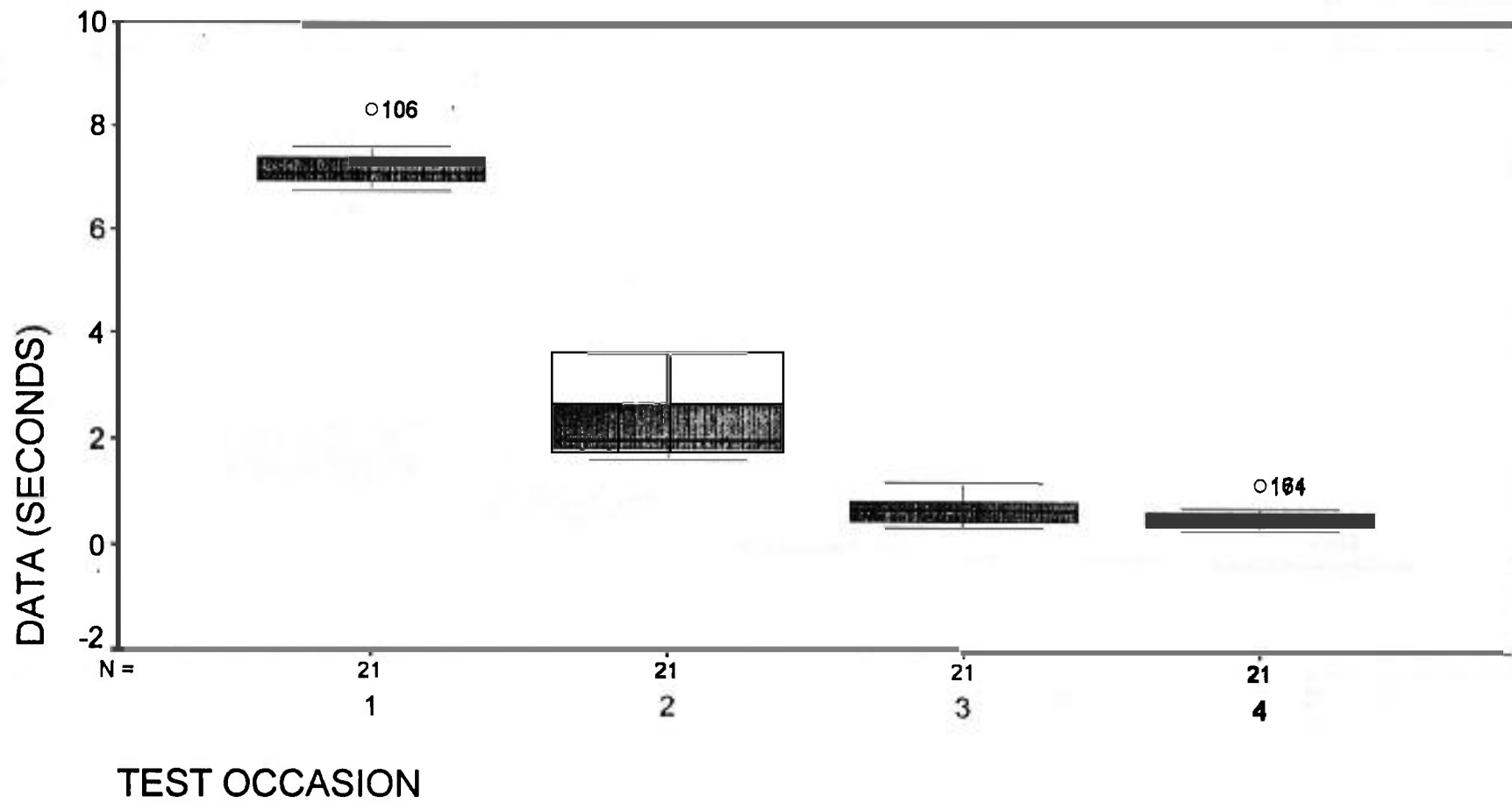
Extreme values were recorded for most subjects on Test Occasion 1, however, even on Test Occasions 3 and 4 where subjects were more consistent there were still some extreme values recorded, as demonstrated by the extremely short 'whiskers' .



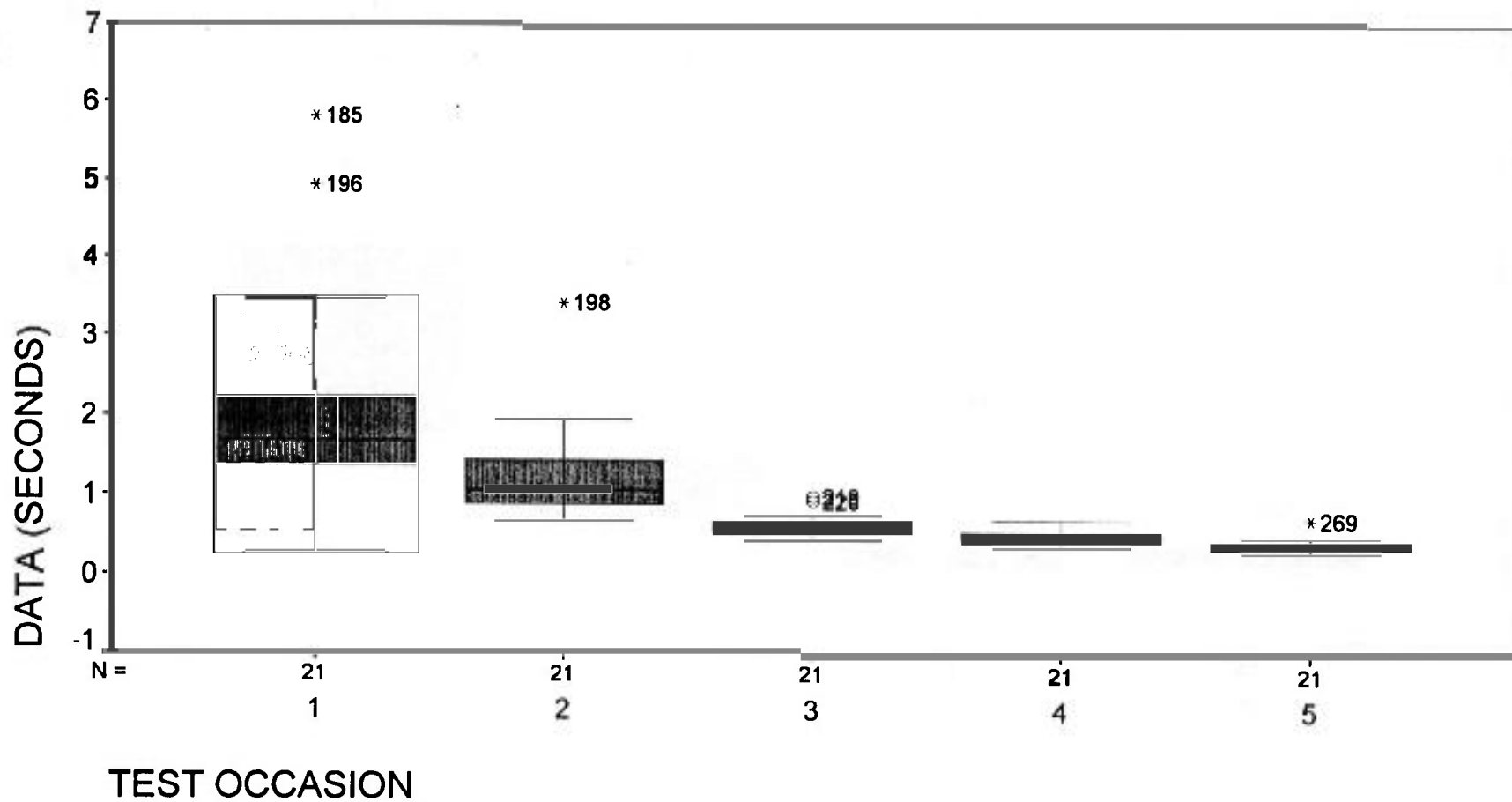
ALL SUBJECTS
REACTION TIME TASK



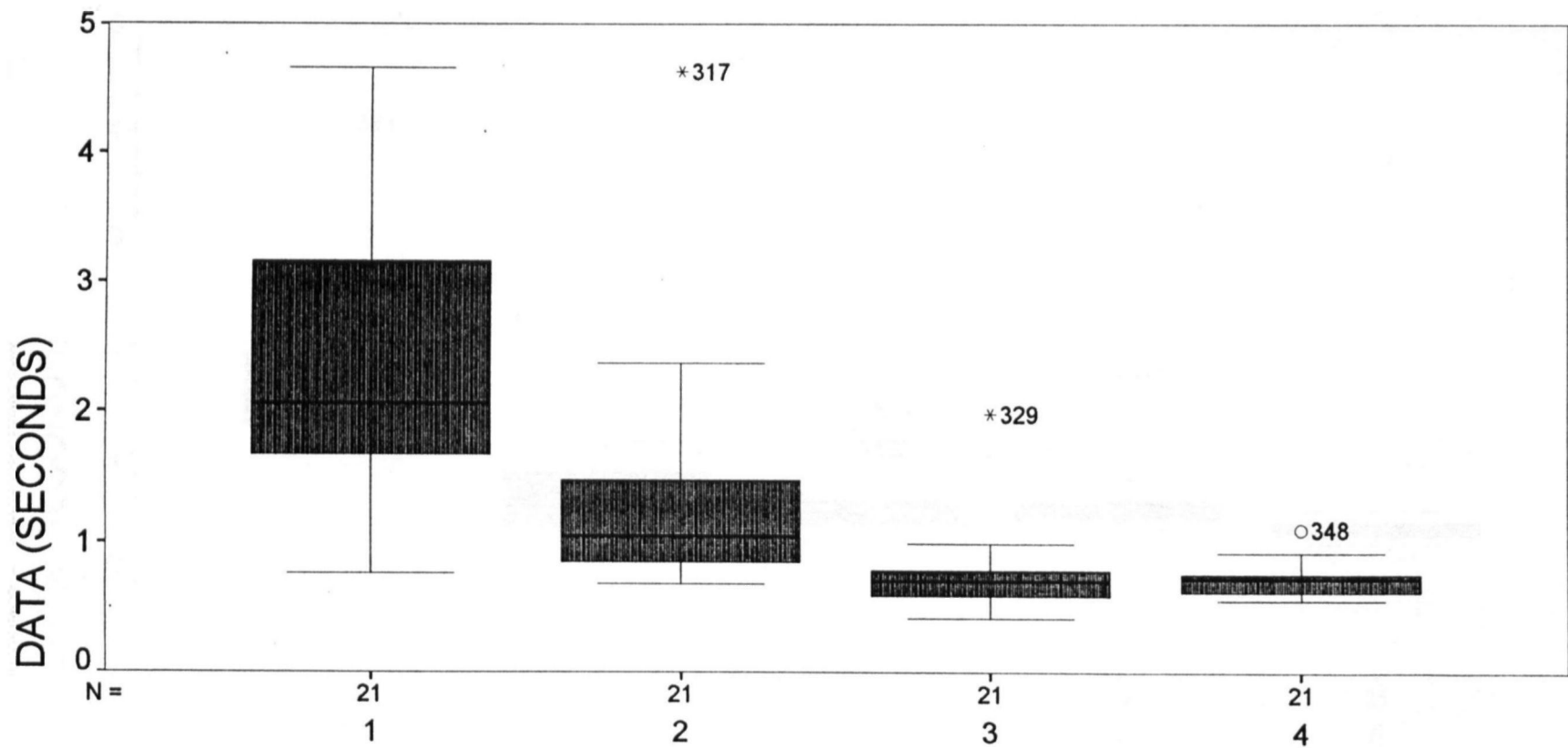
SUBJECT J.Z.
REACTION TIME TASK



SUBJECT F.G.
REACTION TIME TASK

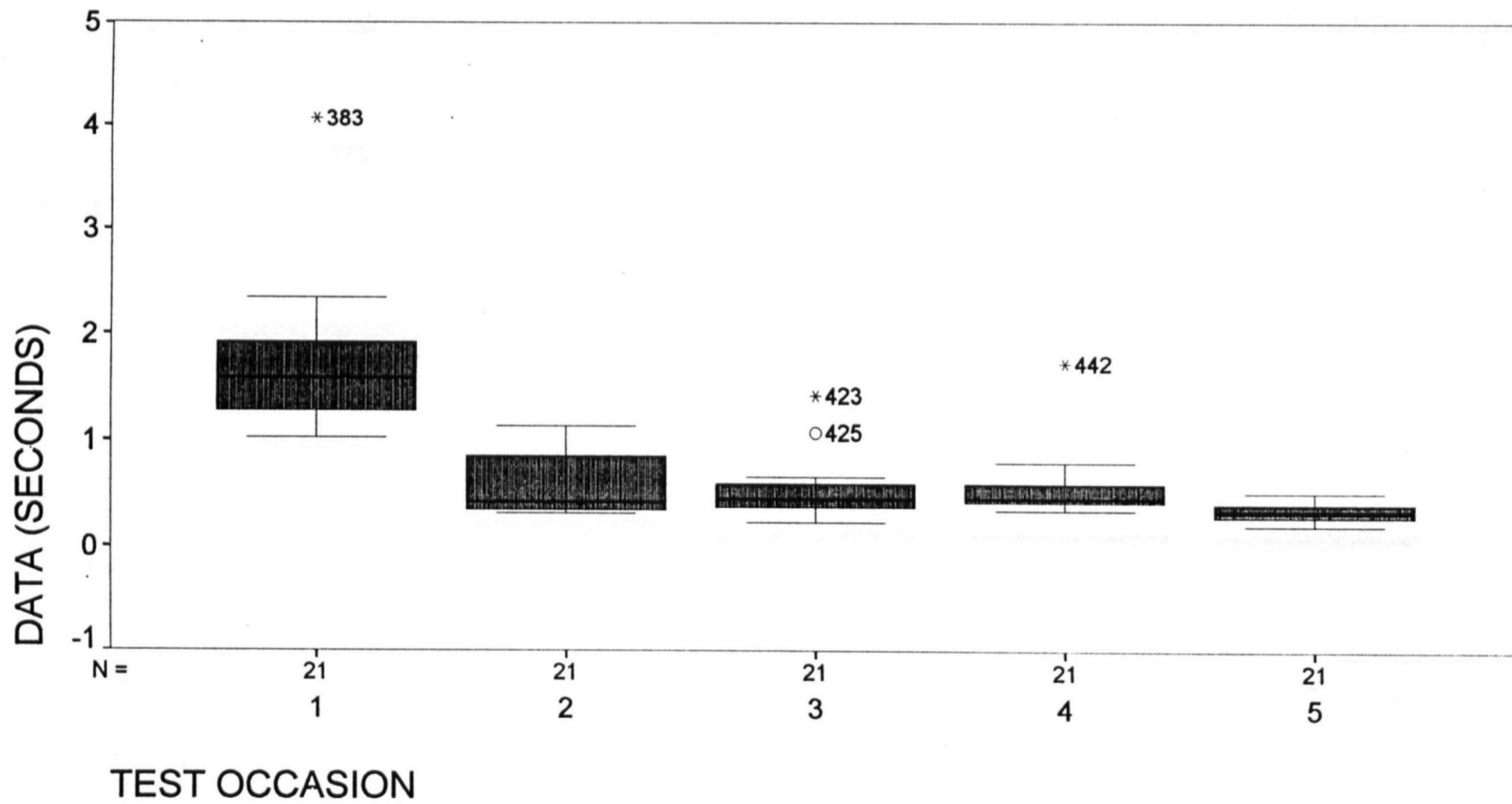


SUBJECT M.R.
REACTION TIME TASK

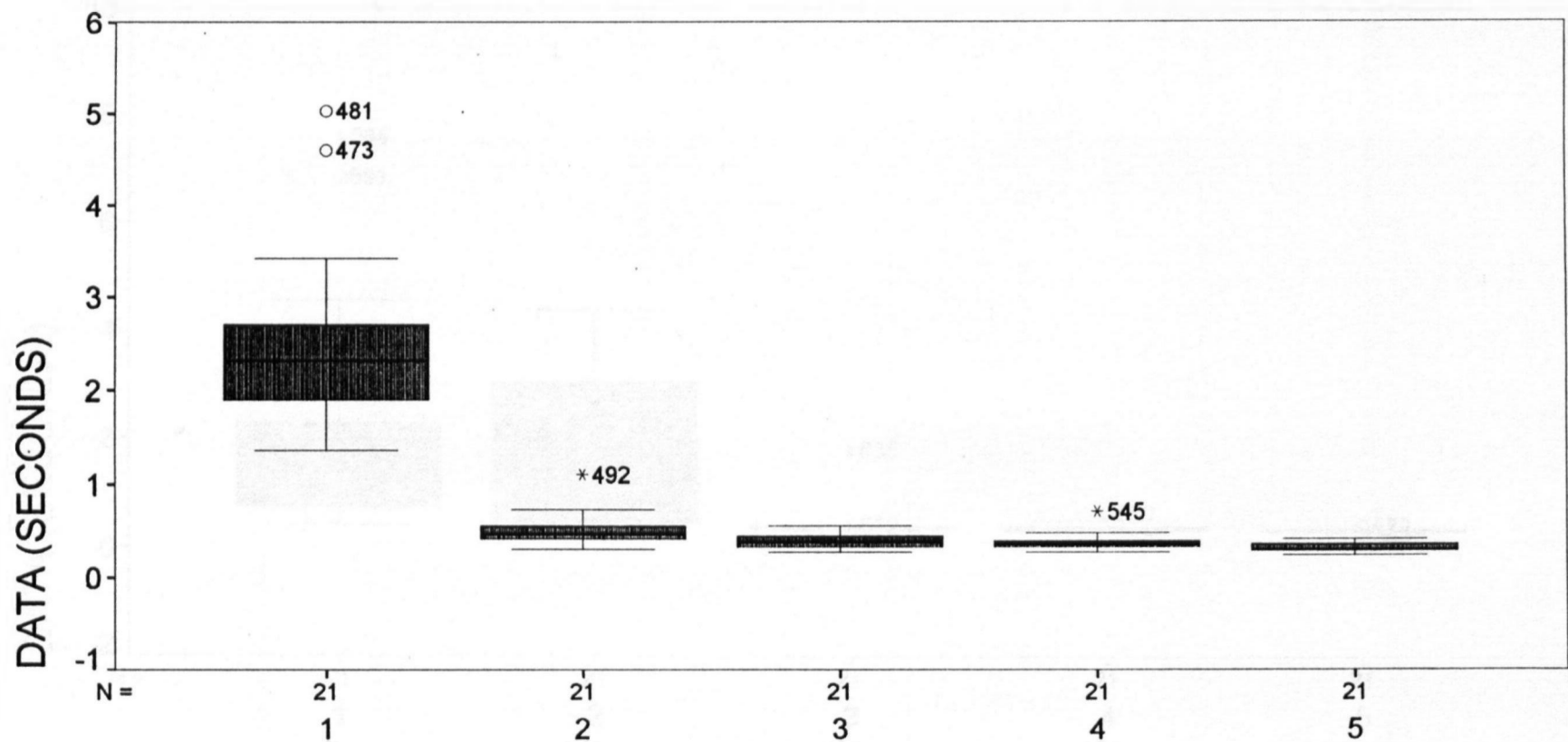


TEST OCCASION

SUBJECT M.P.
REACTION TIME TASK

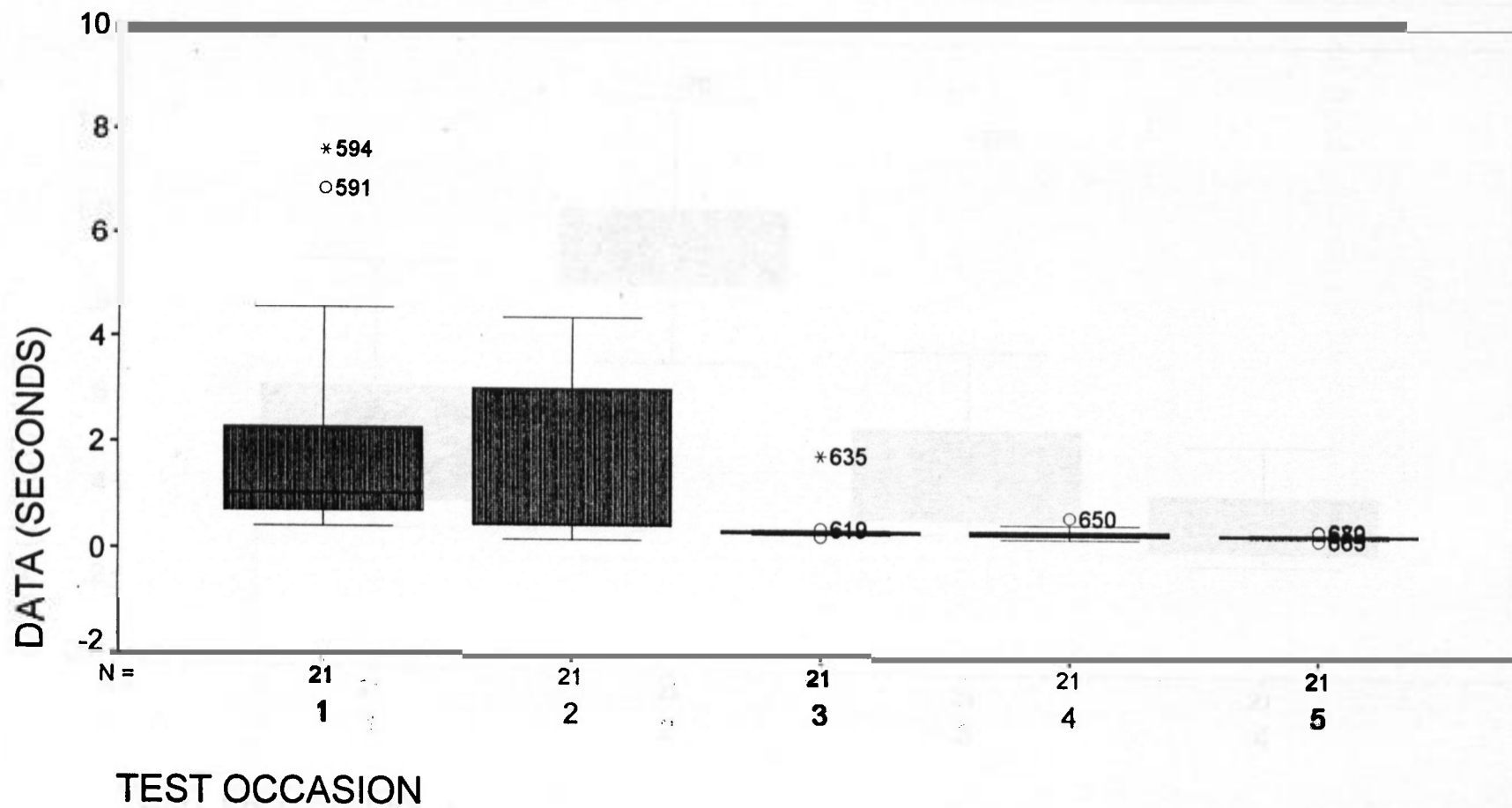


SUBJECT K.C.
REACTION TIME TASK

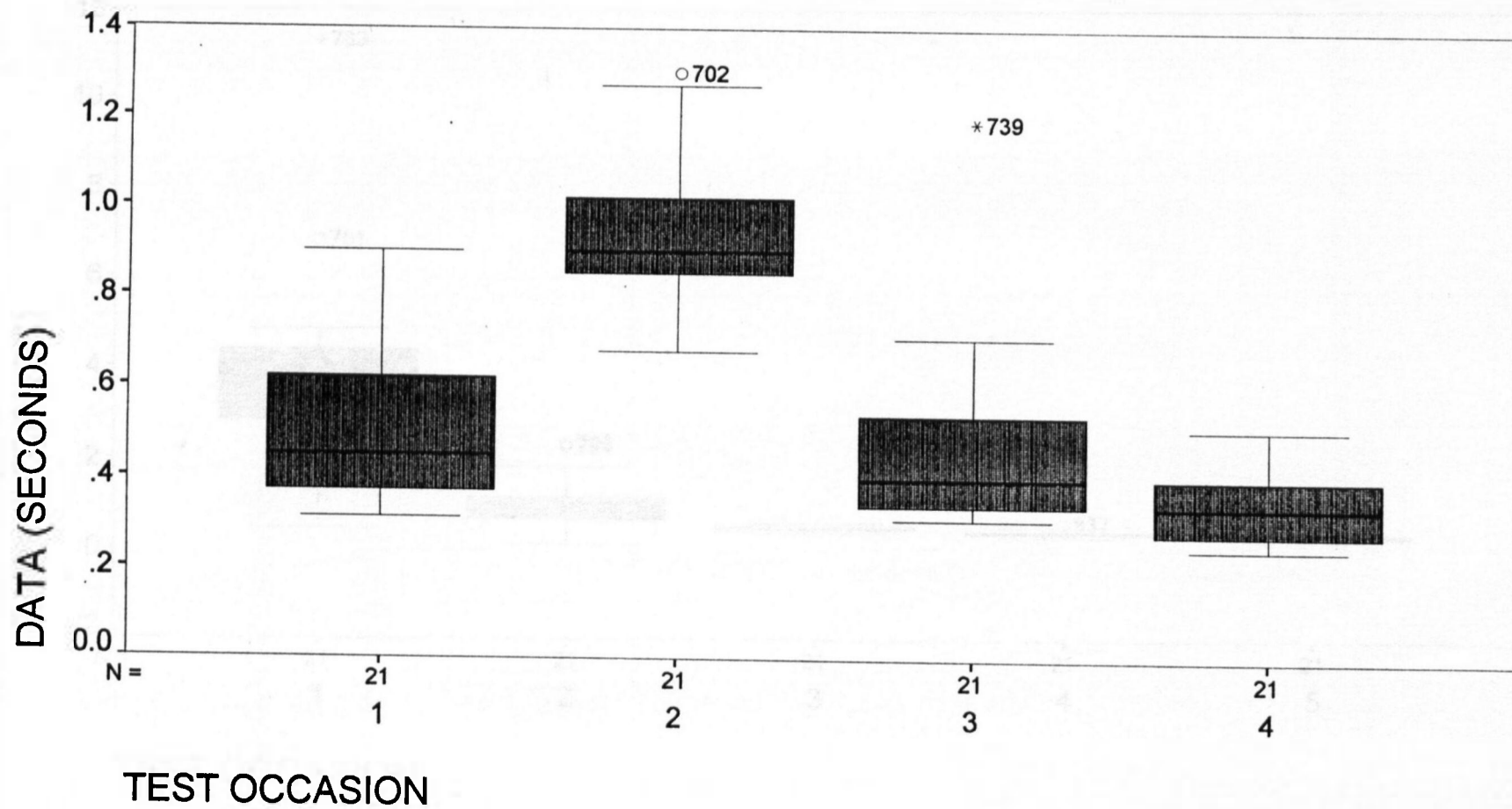


TEST OCCASION

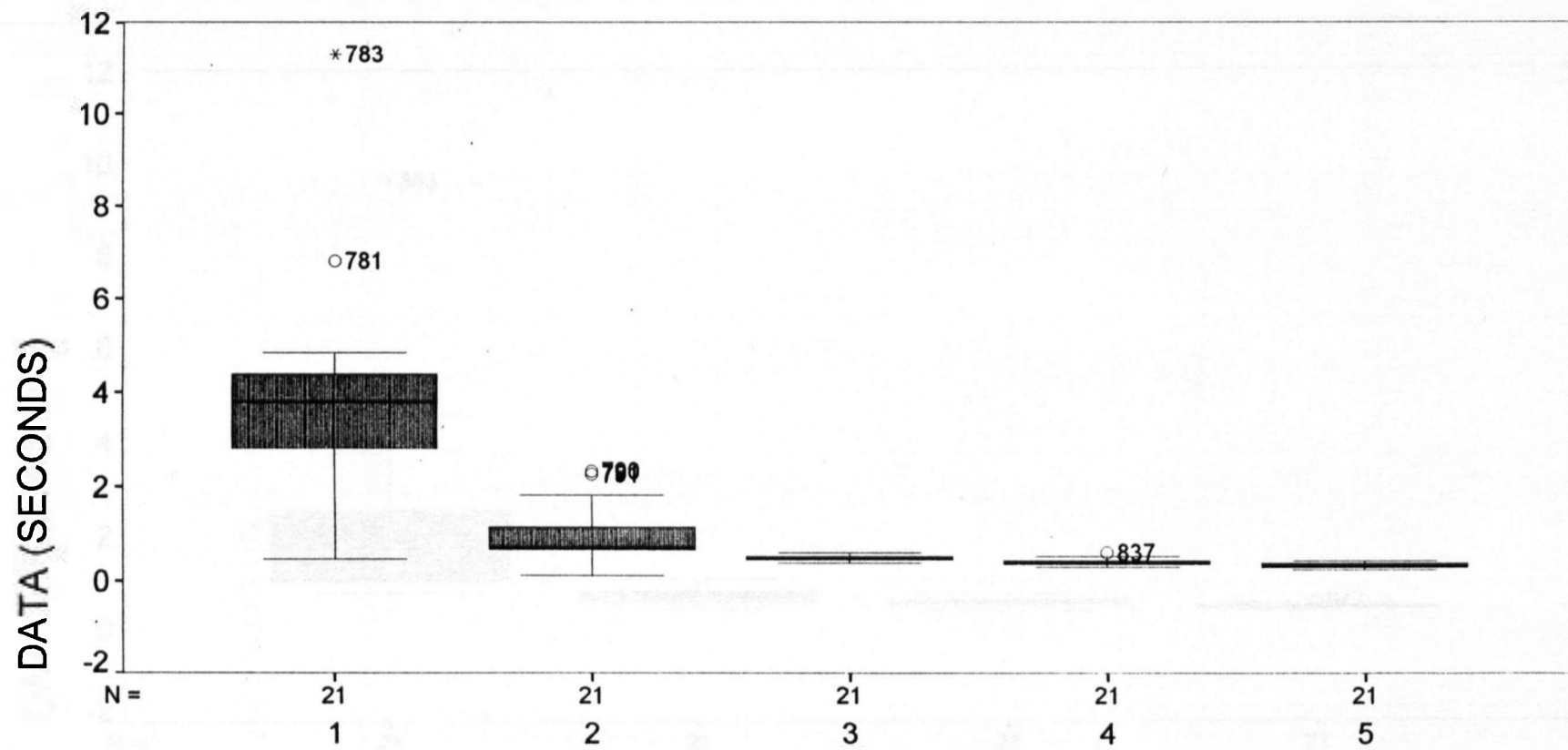
SUBJECT B.W.
REACTION TIME TASK



SUBJECT P.R.
REACTION TIME TASK

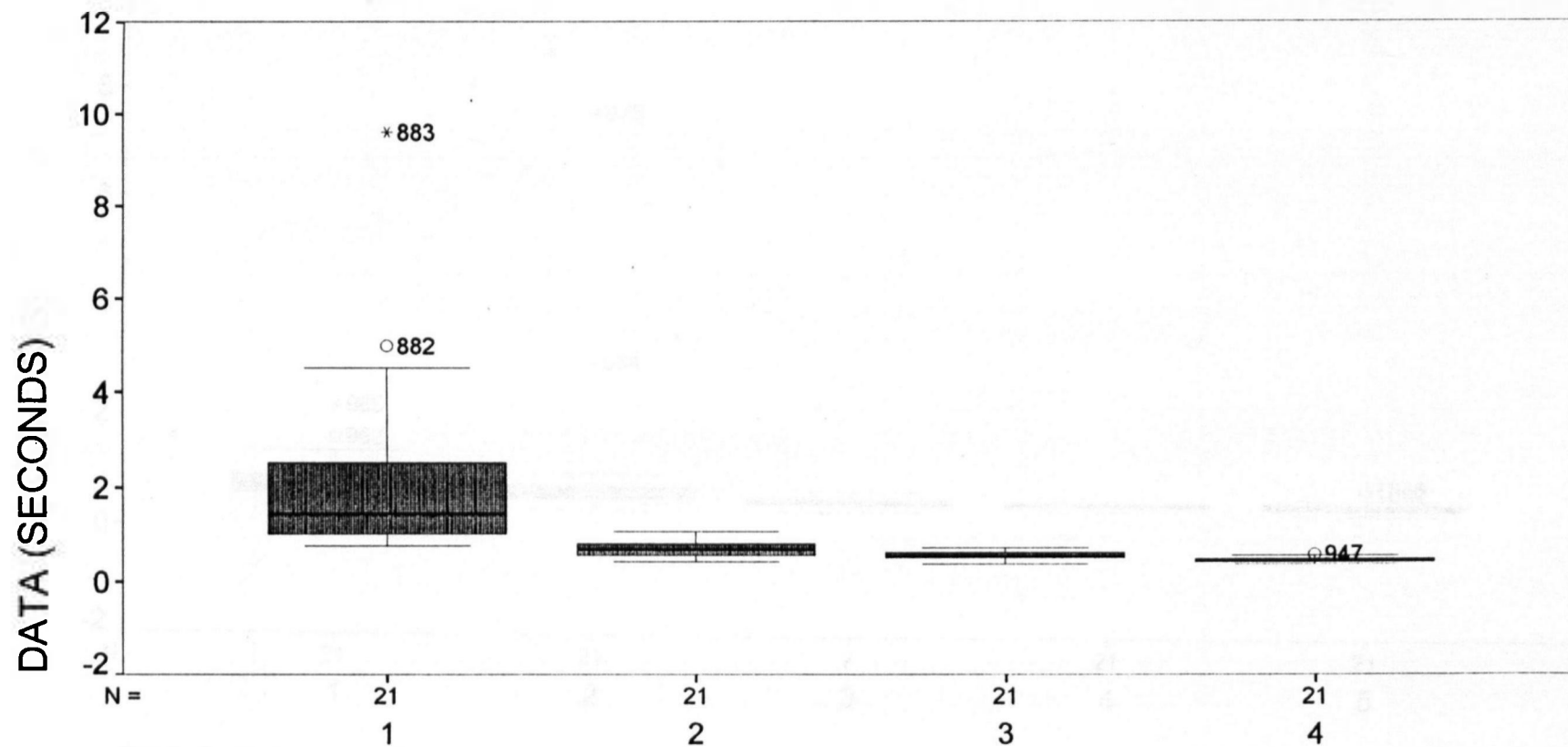


SUBJECT H.K.
REACTION TIME TASK



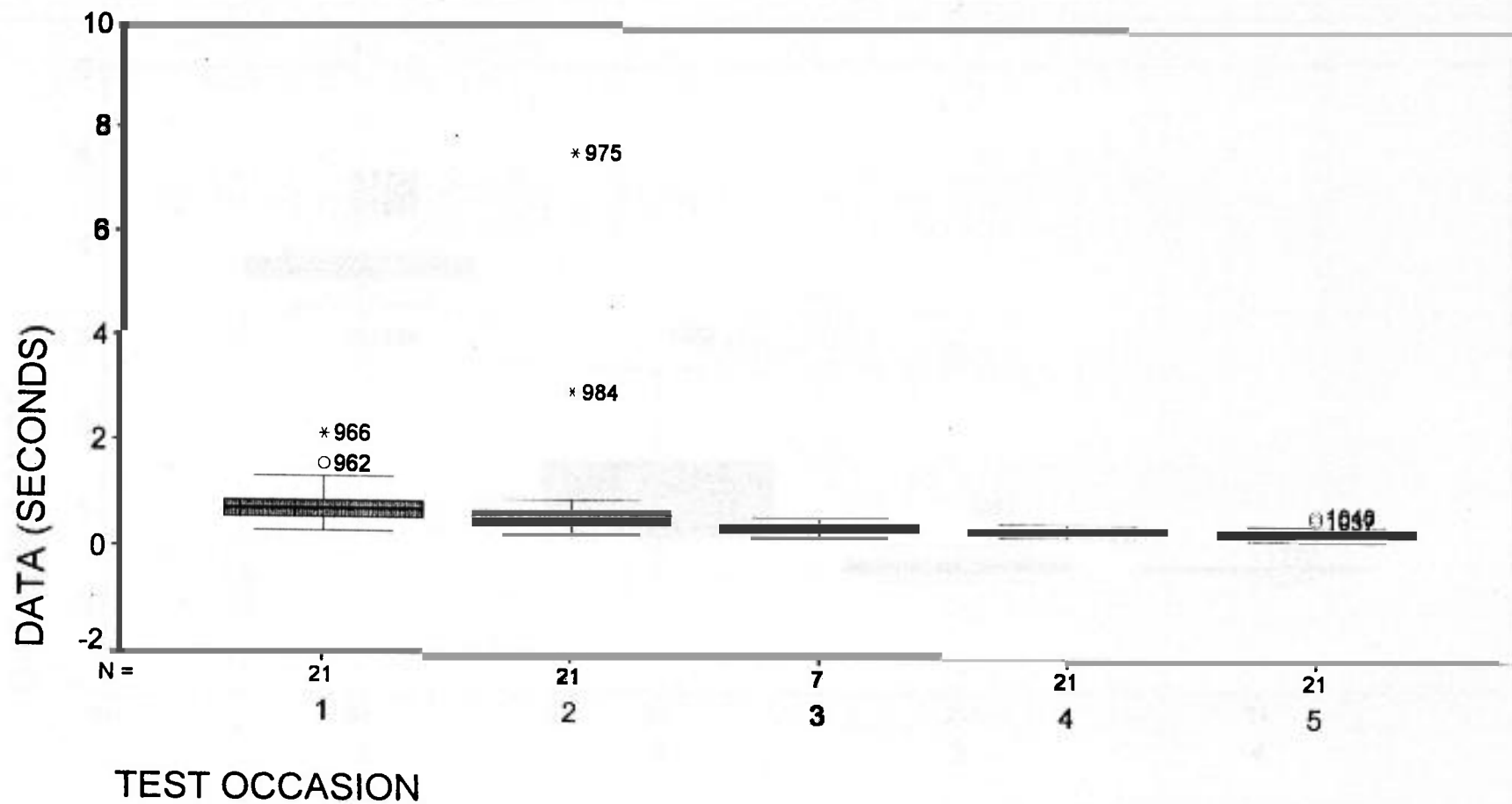
TEST OCCASION

SUBJECT O.L.
REACTION TIME TASK

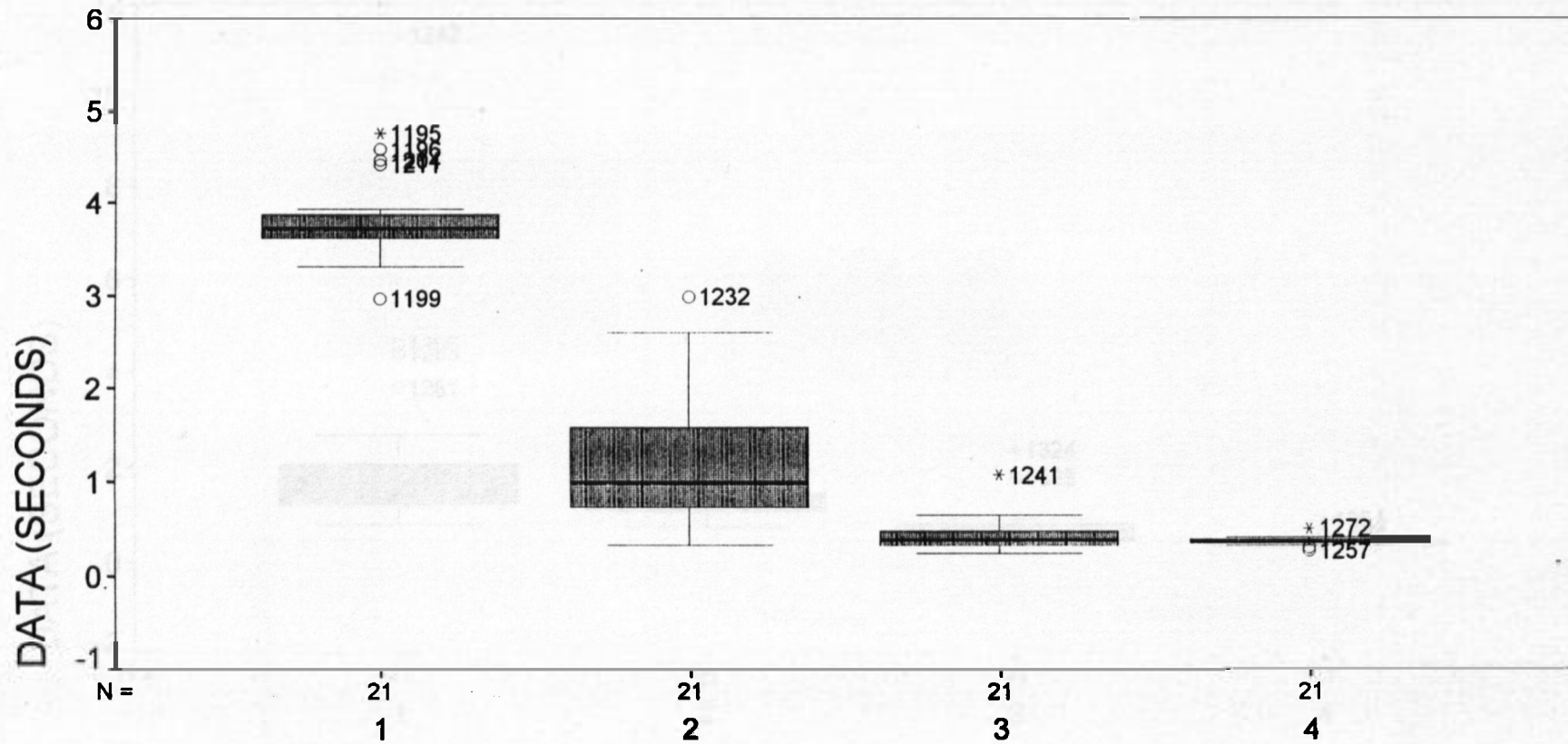


TEST OCCASION

SUBJECT C.C.
REACTION TIME TASK

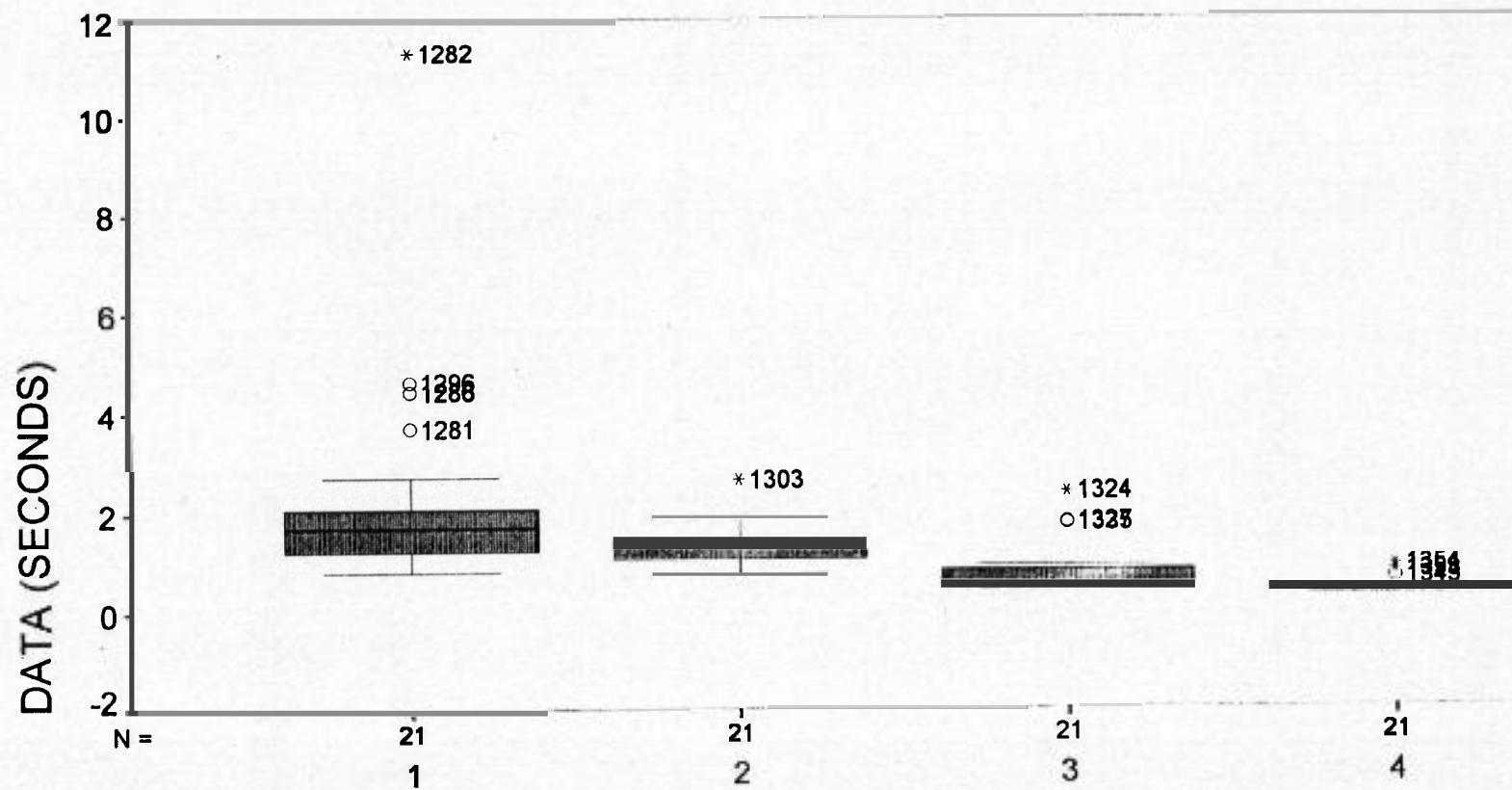


SUBJECT B.J.
REACTION TIME TASK



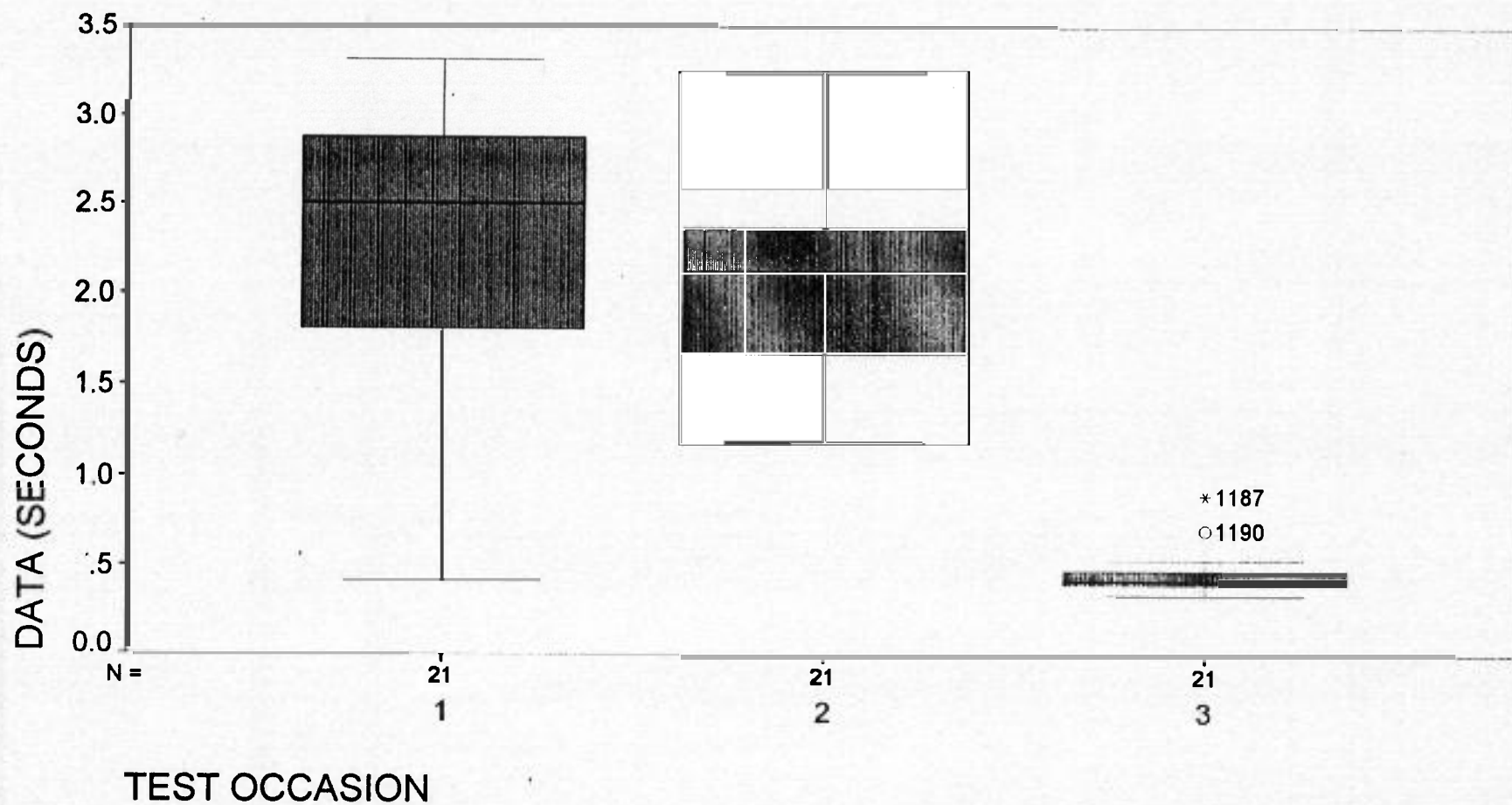
TEST OCCASION

SUBJECT E.A.
REACTION TIME TASK

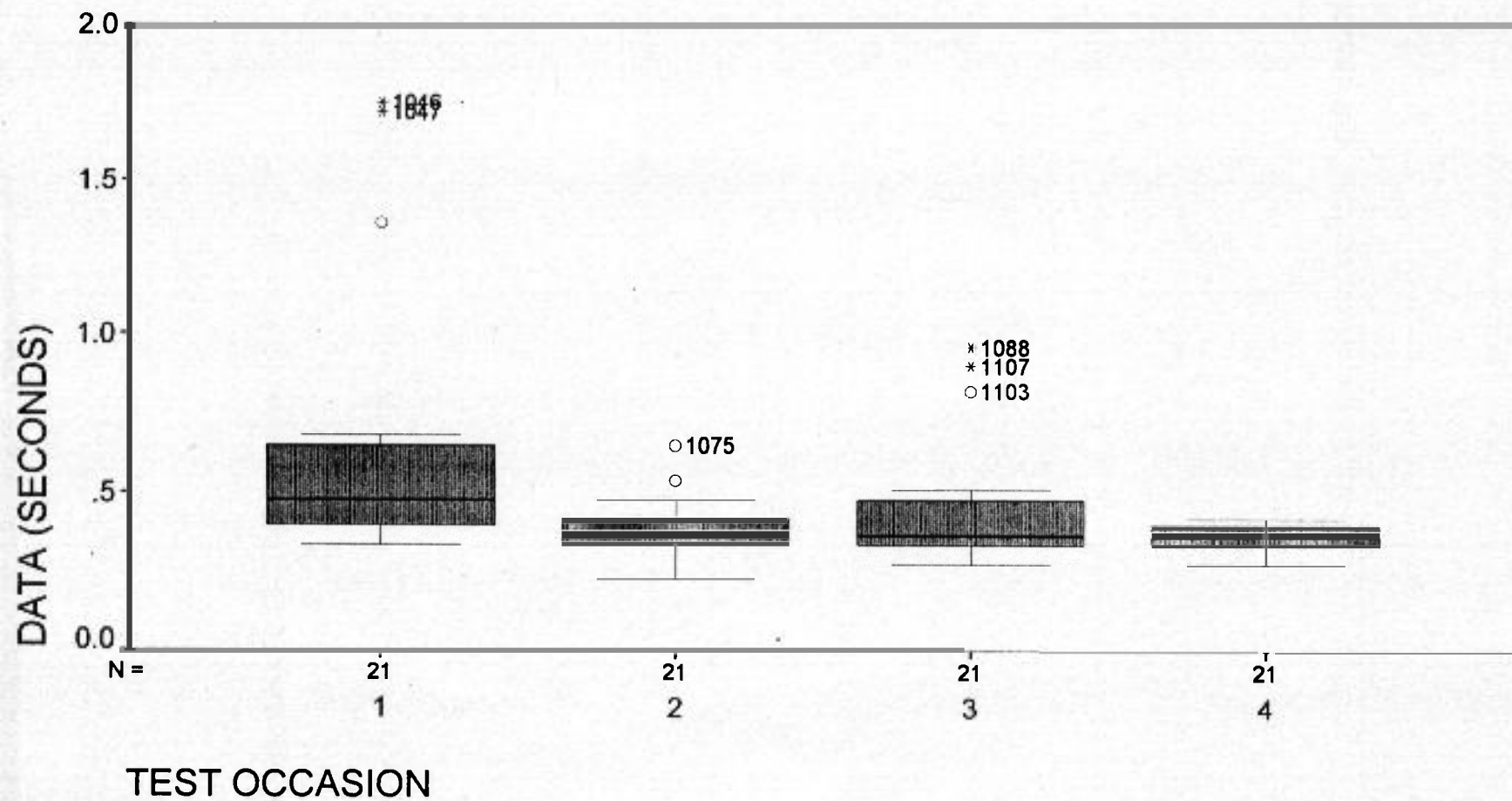


TEST OCCASION

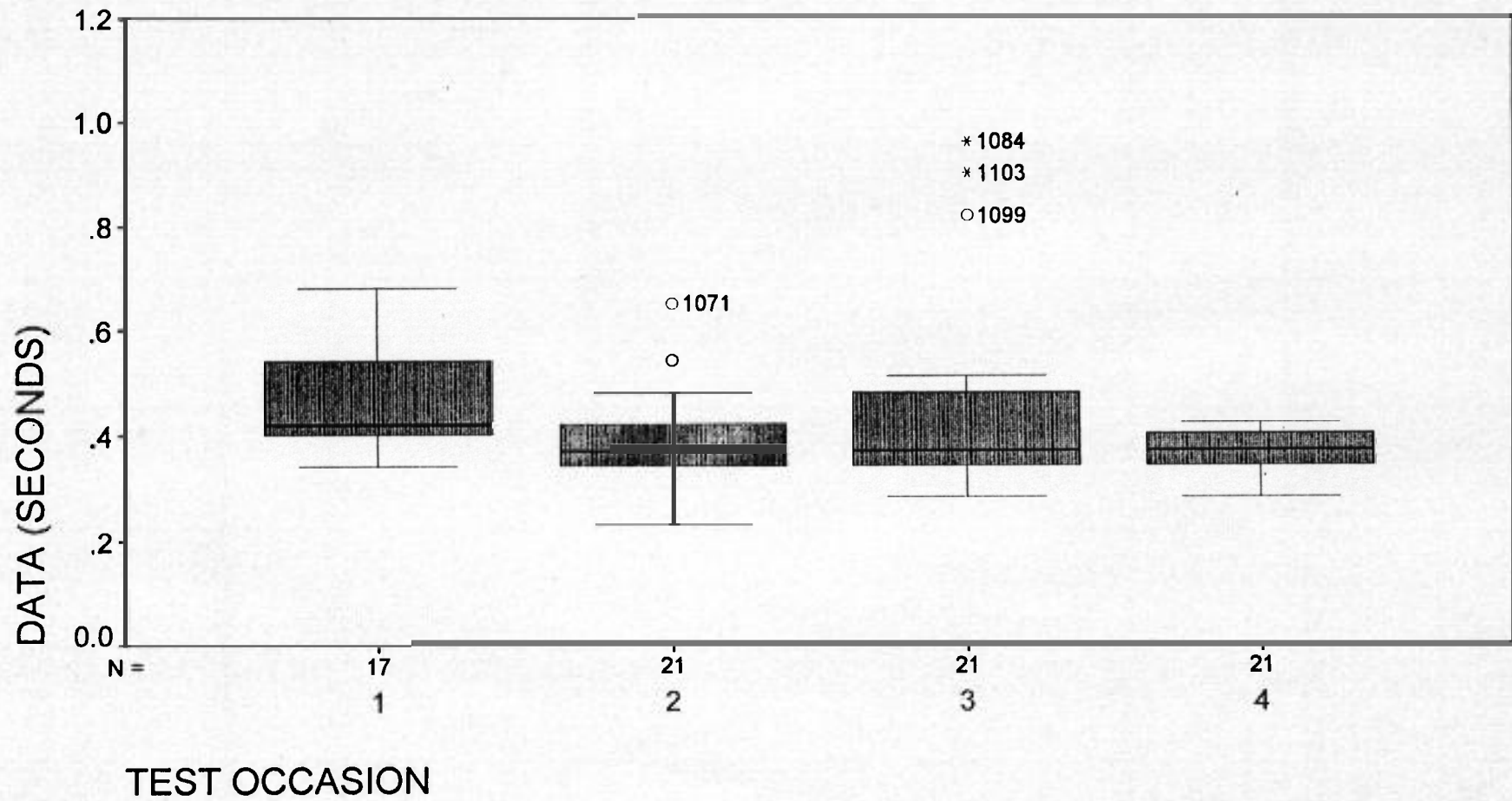
SUBJECT L.A.
REACTION TIME TASK



SUBJECT M.A.
REACTION TIME TASK



SUBJECT N.B.
REACTION TIME TASK



SUBJECT N.B.
R.T. TASK excl. first 4 responses

