Humpty Dumpty had a great ... banana?
Children’s sentence completions on a working memory reading task.


Towse, John N.¹, Hutton, Una¹, & Hitch, Graham J.²

¹. Department of Psychology, Royal Holloway University of London, Egham, Surrey, TW20 0EX
². Department of Psychology, University of Lancaster, Bailrigg, Lancaster LA1 4YF

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The report is based on research funded by the Economic and Social Research Council, grant number R000236113. The present report provides subsidiary analyses of an experiment on children’s working memory (reading) span. Details of the subjects, span scores, and the variation in span performance across experimental manipulations is described elsewhere (Towse, Hitch, & Hutton, in prep.). We are grateful to the staff and pupils at St. Nicholas school, Shepperton, for their cooperation in this study.

Overview

Sixty five children were asked to complete a series of sentences as part of working memory reading span test. Data are provided on the words used to complete the 180 stimulus sentences. It is hoped that providing the sentences and the subjects’ response patterns to them may be useful to other researchers attempting to construct similar experimental materials.
Experimental subjects, design and method

In order to provide a measure of children’s ‘reading span’ (a measure of immediate or working memory), we asked children to read to themselves a (varying-length) set of sentences and supply the missing (final) word. Sixty-five children participated; the mean age of all children was 9 years 4 months, ranging 7;10 to 10;8.

Sentences were presented in large type (48 point font) as ‘cards’ on the screen of a Apple Powerbook 5300c computer. Concurrent with this sentence task, children were asked to remember the words which they supplied for a subsequent recall exercise. Initially, two sentences would be presented to the subject, after which recall of both sentence-terminal words was requested. If children were able to remember all the words (in their correct serial order) on 2 out of 3 occasions at this or subsequent levels, then span length was increased by 1 and testing was continued. Where children failed to reach this criterion, testing was terminated for that experimental condition. Therefore, the number of sentences presented to children varied as a function of children’s proficiency at remembering the set of target words they had produced.

If a subject had encountered an identical sentence on more than one occasion, then it is somewhat doubtful that it would be read in the same way, making interpretation of performance difficult. Accordingly, it was felt necessary to ensure that during testing, sentences were sampled without replacement from the stimulus pool. However, this in turn meant that a substantial corpus of sentences was required. It was also important that these sentences could be understood even by young readers (around 8 years of age). An additional constraint was that the target (missing) word was relatively predetermined, in order that subjects could be said to be holding the same information in memory following sentence presentation. Some sentences were available from previous research studies (e.g. Leather and Henry, 1994), but this experiment required a larger stimulus set, and some of the sentences required adaptation.

Finally, because the experiment involved the presentation of two forms of some sentences (a short or quick-to-read sentence and a long or slow-to-read sentence), both of which yielded the same target word, a subset of the sentences were constructed which took a short and long form. Because of the constraint that sentences should not repeat across trials in the experiment, presentation of the short or long form of these sentences precluded the alternative version from being used elsewhere as a test sentence for that subject.

Likewise this non-repetition criterion meant that some candidate sentences were not included in this corpus. Thus, “Ben is the name of my teddy... bear” was originally considered as an appropriate sentence (but see sentences 45 and 94), as was “If you shut your eyes you can’t... see” (but which was homophonic with a target word “sea” in sentences 19 and 164). Because of their neighbours in the stimulus pool, such sentences were not included.
The reading task was introduced using three practice sentences written on paper cards and presented prior to computer administration of the task. The three sentences (and the target words in parentheses) were:

“An insect that buzzes is called a...” (bee)
“The cat sat on the...” (mat)
“The cow jumped over the...” (moon)

Children invariably understood these practice sentences and produced the expected target word.

Results

As the tabled information illustrates, the sentences as a whole were very successful in generating the predicted target word from subjects (this occurred on 90.7% of trials). Some sentences were found to generate alternative answers which were quite acceptable (e.g. sentence 164, where “water” was often used instead of “sea”). Occasionally, children failed to produce a word at all, and this is entered as a “---” response. There were only a few examples where subjects produced bizarre words, such as “Humpty Dumpty had a great ....... banana”, where it is not obvious that the subject had properly read or comprehended the sentence. Overall, however, target word responses were elicited. Given this high level of target word production, we conclude that subjects were able to read the sentences appropriately, and we take this as evidence that the level of sentence complexity level was acceptable.

References


1. 'Choo-choo' goes the .... train
   Target answers: 12
   Non target answers: 1 (kettle)

2. 'quack quack' said the .... duck
   Target answers: 21
   Non target answers: 0

3. A baby dog is called a .... puppy
   Target answers: 12
   Non target answers: 0

4. A bicycle has two round .... wheels
   Target answers: 7
   Non target answers: 3 (tyres)

5. A clown always has a big smile on his.... face
   Target answers: 22
   Non target answers: 0

6. A clown has a happy .... face
   Target answers: 9
   Non target answers: 3 (clown x 2, person)

7. A cow eats .... grass
   Target answers: 28
   Non target answers: 3 (food, hay, meat)

8. A cow lives in a field and eats the long green.... grass
   Target answers: 13
   Non target answers: 0

9. A dog and a cat and a mouse all walk on four.... legs
   Target answers: 21
   Non target answers: 5 (feet x 2, miles, paws)

10. A fire feels very... hot
    Target answers: 26
    Non target answers: 0
11. A giraffe has a long... neck
Target answers: 15
Non target answers: 0

12. A giraffe is a tall animal with a great long... neck
Target answers: 12
Non target answers: 1 (tail)

13. A joke makes me... laugh
Target answers: 17
Non target answers: 1 (giggle)

14. A kitten grows up to be a... cat
Target answers: 15
Non target answers: 0

15. A man wearing a crown is called... king
Target answers: 5
Non target answers: 0

16. A postbox is coloured... red
Target answers: 13
Non target answers: 0

17. A snail takes a long time to move because it is very... slow
Target answers: 17
Non target answers: 3 (fat, heavy, slimy)

18. A square has four straight... sides
Target answers: 6
Non target answers: 4 (lines x 3, edges)

19. A whale swims in the... sea
Target answers: 3
Non target answers: 2 (water)

20. A window is made of... glass
Target answers: 11
Non target answers: 0

21. A woman wearing a crown is called... queen
Target answers: 7
Non target answers: 0
22. Add some sugar and then stir the tea with a tea.... spoon
Target answers: 8
Non target answers: 4 (bag x 3, cup)

23. After the number one is two and after the number two is.... three
Target answers: 8
Non target answers: 0

24. After winter comes the.... spring
Target answers: 8
Non target answers: 4 (summer x 4)

25. An elephant is very big and has two great big.... ears
Target answers: 10
Non target answers: 6 (feet, horns, husks, legs x 2, trunks)

26. Ann always likes to eat a big bowl of strawberries and.... cream
Target answers: 15
Non target answers: 4 (berries, ice cream, sugar x 2)

27. Ann likes strawberries and.... cream
Target answers: 6
Non target answers: 4 (apples, bananas, cherries, ice cream)

28. At night I go to bed and fall.... asleep
Target answers: 8
Non target answers: 0

29. At school we were told how to sing a.... song
Target answers: 8
Non target answers: 2 (carol, hymn)

30. At the end of my hand I have four fingers and one.... thumb
Target answers: 14
Non target answers: 0

31. Ben clapped his.... hands
Target answers: 7
Non target answers: 0

32. Ben ran fast and won the.... race
Target answers: 16
Non target answers: 3 (cup, medal x 2)
33. Ben ran faster and faster so he could try and win the.... race
Target answers: 6
Non target answers: 0

34. Birds flap and flap their wings and.... fly
Target answers: 11
Non target answers: 0

35. Birds use wings to.... fly
Target answers: 13
Non target answers: 0

36. Cars drive on the.... road
Target answers: 14
Non target answers: 2 (wheels)

37. Chris drank his orange.... juice
Target answers: 15
Non target answers: 3 (drink, squash, ----)

38. Chris squeezed some oranges and had some orange.... juice
Target answers: 13
Non target answers: 1 (left)

39. Do you think Mark likes to drink a glass of coca.... cola
Target answers: 10
Non target answers: 4 (chocolate x 2, milk, pops)

40. Eight and one makes.... nine
Target answers: 21
Non target answers: 0

41. Every day I comb my.... hair
Target answers: 27
Non target answers: 1 (day)

42. Every day in the morning I comb and brush my.... hair
Target answers: 9
Non target answers: 2 (teeth x 2)

43. Every week we go to the library to read a.... book
Target answers: 9
Non target answers: 0
44. Four and one makes.... five  
Target answers: 5  
Non target answers: 1 (cakes)

45. Goldilocks and the three.... bears  
Target answers: 11  
Non target answers: 0

46. Grass is coloured.... green  
Target answers: 10  
Non target answers: 0

47. He crossed the river in a rowing.... boat  
Target answers: 12  
Non target answers: 1 (---)

48. He went to the disco for a.... dance  
Target answers: 6  
Non target answers: 6 (night x 2, party x 4)

49. Humpty Dumpty had a great.... fall  
Target answers: 13  
Non target answers: 1 (banana)

50. I am going to drive a.... car  
Target answers: 11  
Non target answers: 3 (lesson, mile, motorbike)

51. I am thirsty and I want a.... drink  
Target answers: 7  
Non target answers: 0

52. I am tired at the end of the.... day  
Target answers: 11  
Non target answers: 3 (game, race, week)

53. I can find a post box - a post box is coloured.... red  
Target answers: 13  
Non target answers: 0

54. I can fly in a.... plane  
Target answers: 5  
Non target answers: 2 (sky x 2)
55. I can look around and see things with my... eyes
Target answers: 9
Non target answers: 0

56. I can tell what time it is when I look at my wrist... watch
Target answers: 12
Non target answers: 0

57. cut my food with a... knife
Target answers: 9
Non target answers: 0

58. I don't have a coat so when it rains I will get... wet
Target answers: 12
Non target answers: 0

59. I drink tea from a tea... cup
Target answers: 10
Non target answers: 2 (bag, pot)

60. I eat with a knife and... fork
Target answers: 17
Non target answers: 0

61. I go to sleep in my... bed
Target answers: 7
Non target answers: 0

62. I go to the cinema and watch a funny... film
Target answers: 11
Non target answers: 1 (movie)

63. I have a tooth brush and some tooth paste to clean my... teeth
Target answers: 18
Non target answers: 0

64. I have a tooth brush to clean my... teeth
Target answers: 9
Non target answers: 0

65. I have four fingers and one... thumb
Target answers: 3
Non target answers: 1 (hand)
66. I hear with my.... ears
Target answers: 7
Non target answers: 2 (friend, mum)

67. I like to paint on paper with a paint.... brush
Target answers: 13
Non target answers: 0

68. I like to play hide and.... seek
Target answers: 17
Non target answers: 1 (seat)

69. I like to read a.... book
Target answers: 12
Non target answers: 1 (comic)

70. I put a hat on my.... head
Target answers: 8
Non target answers: 0

71. I see with my.... eyes
Target answers: 8
Non target answers: 0

72. I sit down and eat my dinner with a knife and.... fork
Target answers: 10
Non target answers: 0

73. I smell with my.... nose
Target answers: 9
Non target answers: 0

74. I tell the time with a wrist.... watch
Target answers: 14
Non target answers: 0

75. I wave goodbye with my.... hand
Target answers: 15
Non target answers: 1 (mum)

76. I wear socks on my.... feet
Target answers: 11
Non target answers: 0
77. If I hear a funny joke it makes me smile and.... laugh
Target answers: 14
Non target answers: 1 (fire)

78. If it rains I will get.... wet
Target answers: 7
Non target answers: 0

79. If my hands are cold I wear my.... gloves
Target answers: 14
Non target answers: 0

80. If the sun is hot and bright I put a hat on my.... head
Target answers: 14
Non target answers: 2 (forehead, hat)

81. If you eat too much you will get.... fat
Target answers: 4
Non target answers: 4 (ache, sick x 3)

82. In the middle of the fire it feels very.... hot
Target answers: 9
Non target answers: 1 (scared)

83. In the sky I can see the moon come out at.... night
Target answers: 11
Non target answers: 1 (dark)

84. In the spring leaves start growing on the big high.... trees
Target answers: 13
Non target answers: 1 (hill)

85. In winter we wear a coat because it is so.... cold
Target answers: 5
Non target answers: 1 (---)

86. Jack and Jill went up the.... hill
Target answers: 15
Non target answers: 0

87. Jane skips with a skipping.... rope
Target answers: 14
Non target answers: 0
88. Jane went to the baker and he then made a loaf of.... bread
Target answers: 14
Non target answers: 1 (mess)

89. Jim likes to eat fish and.... chips
Target answers: 27
Non target answers: 1 (trout)

90. Just in time the football team scored the winning.... goal
Target answers: 2
Non target answers: 1 (team)

91. Leaves blow in the.... wind
Target answers: 7
Non target answers: 2 (air, tree)

92. Leaves grow on the big.... trees
Target answers: 7
Non target answers: 0

93. Mark drinks coca.... cola
Target answers: 17
Non target answers: 1 (---)

94. Mark heard the story of Goldilocks and the three.... bears
Target answers: 17
Non target answers: 0

95. Mark put the lights on the Christmas.... tree
Target answers: 15
Non target answers: 3 (cake x 2, day)

96. Mary unlocks the door with her.... key
Target answers: 16
Non target answers: 1 (hand)

97. Mum sat down in an arm.... chair
Target answers: 20
Non target answers: 0

98. My dog wags his.... tail
Target answers: 7
Non target answers: 0
99. My feet are at the end of my.... legs
   Target answers: 3
   Non target answers: 0

100. My hand is at the end of my.... arm
   Target answers: 8
   Non target answers: 0

101. My pet barks - it is a.... dog
   Target answers: 8
   Non target answers: 0

102. My teeth are in my.... mouth
   Target answers: 14
   Non target answers: 0

103. On a bright sunny day the sky is coloured.... blue
   Target answers: 15
   Non target answers: 0

104. One game for friends to play is hide and.... seek
   Target answers: 13
   Non target answers: 1 (play)

105. Pam put on her socks and.... shoes
   Target answers: 9
   Non target answers: 5 (coat, dress, scarf, ---- x 2)

106. Pam was happy and put on her bright new socks and.... shoes
   Target answers: 15
   Non target answers: 3 (dress, pants, trousers)

107. Paul's dog can run very.... fast
   Target answers: 14
   Non target answers: 0

108. Paul's dog plays in the park and it can run very.... fast
   Target answers: 12
   Non target answers: 1 (muddy)

109. People with lots of money are called.... rich
   Target answers: 12
   Non target answers: 4 (king, millionaires x 3)
110. Robert spent his money at the sweet.... shop
Target answers: 13
Non target answers: 0

111. Seven days make a.... week
Target answers: 15
Non target answers: 1 (cake)

112. Sometimes I go to a swimming.... pool
Target answers: 13
Non target answers: 3 (class, club, session)

113. Sometimes we go out and eat some fish and.... chips
Target answers: 18
Non target answers: 0

114. Stir the tea with a tea.... spoon
Target answers: 15
Non target answers: 4 (bag x 4)

115. Sue has her own little room in a great big.... house
Target answers: 11
Non target answers: 4 (bed, bedroom x 2, mess, room)

116. Sue lives in a.... house
Target answers: 9
Non target answers: 1 (flat)

117. Teacher told the class a.... story
Target answers: 9
Non target answers: 3 (lesson, poem, sum)

118. That shiny new bike in the bike shop has two round.... wheels
Target answers: 4
Non target answers: 1 (tyres)

119. The baker made a loaf of.... bread
Target answers: 13
Non target answers: 0

120. The cinema shows a.... film
Target answers: 9
Non target answers: 4 (movie, picture x 2, play)
121. The colour of a banana is.... yellow  
Target answers: 6  
Non target answers: 0

122. The dog wagged his.... tail  
Target answers: 9  
Non target answers: 0

123. The dog was very happy and so he wagged his.... tail  
Target answers: 13  
Non target answers: 0

124. The farmer lives on a.... farm  
Target answers: 28  
Non target answers: 2 (field, hill)

125. The farmer look after his animals down on his.... farm  
Target answers: 9  
Non target answers: 0

126. The fire engine came and the fire man put out the.... fire  
Target answers: 13  
Non target answers: 1 (smoke)

127. The fire man put out the.... fire  
Target answers: 7  
Non target answers: 0

128. The football team scored a.... goal  
Target answers: 16  
Non target answers: 0

129. The hammer hit the.... nail  
Target answers: 17  
Non target answers: 3 (door x 2, wall)

130. The leaves on the trees are coloured.... green  
Target answers: 7  
Non target answers: 2 (brown x 2)

131. The magician waves his magic.... wand  
Target answers: 7  
Non target answers: 1 (flag)
132. The moon comes out at.... night
Target answers: 15
Non target answers: 1 (dark)

133. The next number after one and two and three is.... four
Target answers: 19
Non target answers: 0

134. The number which always comes after seven and eight is.... nine
Target answers: 14
Non target answers: 2 (head, two)

135. The number which always comes after three and four is.... five
Target answers: 14
Non target answers: 1 (four)

136. The opposite of bad is.... good
Target answers: 10
Non target answers: 0

137. The opposite of black is.... white
Target answers: 13
Non target answers: 0

138. The opposite of dark is.... light
Target answers: 12
Non target answers: 1 (on)

139. The opposite of fat is.... thin
Target answers: 9
Non target answers: 0

140. The opposite of hot is.... cold
Target answers: 15
Non target answers: 0

141. The opposite of long is.... short
Target answers: 11
Non target answers: 1 (small)

142. The pirate found silver and.... gold
Target answers: 12
Non target answers: 0
143. The rabbit ran down his rabbit.... hole
Target answers: 5
Non target answers: 2 (burrow, pen)

144. The rocket left earth and went up and up into outer.... space
Target answers: 30
Non target answers: 0

145. The rocket went up into outer.... space
Target answers: 15
Non target answers: 0

146. The rubbish goes in a rubbish.... bin
Target answers: 9
Non target answers: 1 (bag)

147. The sky is coloured.... blue
Target answers: 8
Non target answers: 0

148. The speed of a snail is.... slow
Target answers: 9
Non target answers: 0

149. The sun shines in the.... sky
Target answers: 3
Non target answers: 3 (house, north, window)

150. There are 7 days in a.... week
Target answers: 13
Non target answers: 0

151. There are 12 months in a.... year
Target answers: 18
Non target answers: 2 (week)

152. There are 60 minutes in an.... hour
Target answers: 12
Non target answers: 0

153. They played football with a foot.... ball
Target answers: 11
Non target answers: 0
154. They washed the dirty dog until he was.... clean
Target answers: 15
Non target answers: 0

155. Three and one makes.... four
Target answers: 12
Non target answers: 0

156. To fetch some water, Jack and Jill went up the.... hill
Target answers: 14
Non target answers: 0

157. To finish the story I turned the last.... page
Target answers: 6
Non target answers: 1 (----)

158. To make a snowman you need.... snow
Target answers: 18
Non target answers: 0

159. To make the trick work the magician waves his magic... wand
Target answers: 13
Non target answers: 0

160. Twinkle twinkle little.... star
Target answers: 9
Non target answers: 0

161. Two and one makes.... three
Target answers: 9
Non target answers: 1 (four)

162. We all sat down and the teacher told the class a funny.... story
Target answers: 4
Non target answers: 6 (class, joke x 4, trick)

163. We live on the planet.... earth
Target answers: 5
Non target answers: 1 (mars)

164. We went to the beach and we had a swim in the cold... sea
Target answers: 9
Non target answers: 13 (beach, water x 12)
165. When babies are hungry they.... cry
Target answers: 13
Non target answers: 3 (eat x 3)

166. When David cleans he sweeps the.... floor
Target answers: 8
Non target answers: 2 (dust, kitchen)

167. When I have a cold I have to blow my.... nose
Target answers: 19
Non target answers: 2 (face, ----)

168. When I wake up I open my eyes and get out of.... bed
Target answers: 16
Non target answers: 0

169. When it snows every thing turns the colour.... white
Target answers: 9
Non target answers: 0

170. When Mary got home she unlocked the door with her.... key
Target answers: 16
Non target answers: 0

171. When Mum is tired she likes to sit down in an arm.... chair
Target answers: 3
Non target answers: 0

172. When you want to see in the dark you can turn on a.... light
Target answers: 12
Non target answers: 1 (torch)

173. While sleeping I had a strange.... dream
Target answers: 8
Non target answers: 0

174. Wool comes from.... sheep
Target answers: 17
Non target answers: 0

175. Worms live under the.... ground
Target answers: 15
Non target answers: 2 (earth, soil)
176. **You can build a house with.... bricks**
Target answers: 11
Non target answers: 0

177. **You can see my white teeth when I open my.... mouth**
Target answers: 11
Non target answers: 0

178. **You can see through a window when it is made of.... glass**
Target answers: 16
Non target answers: 0

179. **You get hungry if you have no.... food**
Target answers: 10
Non target answers: 1 (dinner)

180. **You paint with a paint.... brush**
Target answers: 18
Non target answers: 1 (pot)
An animated version of the popular children's nursery rhyme 'Humpty Dumpty sat on a wall'. He had a great fall - from the highest high - high! All the king's horses and all the king's men, Couldn't put Humpty together again. Humpty Dumpty sat on the ground, Humpty Dumpty looked all around, Gone were the chimneys and gone were the roofs, All he could see was horses and hooves. He fell off the wall - from the highest high - so high! He had a great fall - from the highest high - high! All the king's horses and all the king's men, Couldn't put Humpty together again. Humpty Dumpty sat on a wall, Humpty Dumpty had a great fall, All the king's horses and