READING PASSAGE 3

You should spend about 20 minutes on ***Questions 28–40*** *which are based on Reading Passage 3 below.*

CHILDREN'S THINKING

One of the most eminent of psychologists, Clark Hull, claimed that the essence of reasoning lies in the putting together of two 'behaviour segments' in some novel way, never actually performed before, so as to reach a goal.

Two followers of Clark Hull, Howard and Tracey Kendler, devised a test for children that was explicitly based on Clark Hull's principles. The children were given the task of learning to operate a machine so as to get a toy. In order to succeed they had to go through a two-stage sequence. The children were trained on each stage separately. The stages consisted merely of pressing the correct one of two buttons to get a marble; and of inserting the marble into a small hole to release the toy.

The Kendlers found that the children could learn the separate bits readily enough. Given the task of getting a marble by pressing the button they could get the marble; given the task of getting a toy when a marble was handed to them, they could use the marble. (All they had to do was put it in a hole.) But they did not for the most part 'integrate', to use the Kendlers' terminology. They did not press the button to get the marble and then proceed without further help to use the marble to get the toy. So the Kendlers concluded that they were incapable of deductive reasoning.

The mystery at first appears to deepen when we learn, from another psychologist, Michael Cole, and his colleagues, that adults in an African culture apparently cannot do the Kendlers' task either. But it lessens, on the other hand, when we learn that a task was devised which was strictly analogous to the Kendlers' one but much easier for the African males to handle.

Instead of the button-pressing machine, Cole used a locked box and two differently coloured match-boxes, one of which contained a key that would open the box. Notice that there are still two behaviour segments – 'open the right match-box to get the key' and 'use the key to open the box' – so the task seems formally to be the same. But psychologically it is quite different. Now the subject is dealing not with a strange machine but with familiar meaningful objects; and it is clear to him what he is meant to do. It then turns out that the difficulty of 'integration' is greatly reduced.

Recent work by Simon Hewson is of great interest here for it shows that, for young children, too, the difficulty lies not in the inferential processes which the task demands, but in certain perplexing features of the apparatus and the procedure. When these are changed in ways which do not at all affect the inferential nature of the

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problem. then five-year-old children solve the problem as well as college students did in the Kendlers' own experiments.

Hewson made two crucial changes. First, he replaced the button-pressing mechanism in the side panels by drawers in these panels which the child could open and shut. This took away the mystery from the first stage of training. Then he helped the child to understand that there was no 'magic' about the specific marble which, during the second stage of training, the experimenter handed to him so that he could pop it in the hole and get the reward.

A child understands nothing, after all, about how a marble put into a hole can open a little door. How is he to know that any other marble of similar size will do just as well? Yet he must assume that if he is to solve the problem. Hewson made the functional equivalence of different marbles clear by playing a 'swapping game' with the children.

The two modifications together produced a jump in success rates from 30 per cent to 90 per cent for five-year-olds and from 35 per cent to 72.5 per cent for four-year-olds. For three-year-olds, for reasons that are still in need of clarification, no improvement – rather a slight drop in performance – resulted from the change.

We may conclude, then, that children experience very real difficulty when faced with the Kendler apparatus; but this difficulty cannot be taken as proof that they are incapable of deductive reasoning.

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Questions 28–35

Classify the following descriptions as referring to

Clark Hull	***CH***
Howard and Tracey Kendler	***HTK***
Michael Cole and colleagues	***MC***
Simon Hewson	***SH***

Write the appropriate letters in boxes 28–35 on your answer sheet.

NB *You may use any answer more than once.*

28 ..... is cited as famous in the field of psychology.

29 ..... demonstrated that the two-stage experiment involving button-pressing and inserting a marble into a hole poses problems for certain adults as well as children.

30 ..... devised an experiment that investigated deductive reasoning without the use of any marbles.

31 ..... appears to have proved that a change in the apparatus dramatically improves the performance of children of certain ages.

32 ..... used a machine to measure inductive reasoning that replaced button-pressing with drawer-opening.

33 ..... experimented with things that the subjects might have been expected to encounter in everyday life, rather than with a machine.

34 ..... compared the performance of five-year-olds with college students, using the same apparatus with both sets of subjects.

35 ..... is cited as having demonstrated that earlier experiments into children's ability to reason deductively may have led to the wrong conclusions.

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Questions 36–40

Do the following statements agree with the information given in Reading Passage 3?
In boxes 36–40 on your answer sheet write

YES *if the statement agrees with the information*
NO *if the statement contradicts the information*
NOT GIVEN *if there is no information on this in the passage*

36 Howard and Tracey Kendler studied under Clark Hull.

37 The Kendlers trained their subjects separately in the two stages of their experiment, but not in how to integrate the two actions.

38 Michael Cole and his colleagues demonstrated that adult performance on inductive reasoning tasks depends on features of the apparatus and procedure.

39 All Hewson's experiments used marbles of the same size.

40 Hewson's modifications resulted in a higher success rate for children of all ages.

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