Section B Model Answer Savage-Rumbaugh

a) Outline the aim of your chosen study.

The aim of the study was to record evidence of spontaneous symbol acquisition in non-human primates.

b) Outline the sample of your chosen study, and suggest one limitation of this sample.

The sample consisted of 4 chimpanzees: two pygmy chimpanzees called Kanzi and Mulika, and two Common chimpanzees called Sherman and Austin. The main 'participant' was Kanzi who was born on 28 th October 1980 in captivity. His mother was a language using chimp and he was assigned to the language research centre at 6 months. He was reared in a language using environment with humans. When he was 2.5 years old he was observed using symbols spontaneously. This serendipitous observation was perhaps because he had seen his mother using symbols. Mulika was reared in a similar was to Kanzi, but the Common chimps were 'taught' language in training sessions rather than being raised in a language using environment.

One limitation of the sample is that is very small. Using only two chimpanzees from each species means that the results cannot be generalised to a wider population of chimpanzees. This is because there might be something peculiar to Kanzi and Mulika that makes them particularly receptive to learning symbols, and to respond to humans. This might not be the case for wild chimpanzees, or pygmy chimpanzees reared in a different way. It might also be that Kanzi is exceptionally intelligent or skilled in this particular way compared to other chimps.

c) Outline how data was gathered in your chosen study. (6)

Kanzi and Mulika used a visual symbol system consisting of geometric symbols (lexigrams) that brightened when touched. The symbols were on an electronic keyboard (automatically recorded by computer), or on a pointing board for use outside (recorded by researchers and then entered into the

computer). A speech synthesiser was added when it became clear that Kanzi could understand the spoken word. Each utterance was classified as: correct or incorrect, spontaneous, imitated, or structured. In order for a word to be considered “acquired” it had to be a spontaneous utterance that could be verified nine times out of ten, for example, if Kanzi indicated he wanted to go to the tree house, and then he took the researcher to this location, then this would be considered verification. During the warmer months of the year, food was placed at 17 locations in the forest surrounding the research centre. The name of each site matched the food that was stored there, and once the chimpanzees had indicated the kind of food they wanted then they had to go to the correct location.

Kanzi was exposed to the use of symbols and gestures and human speech form the age of 6 months as he watched interactions between his mother a nd her keepers. Kanzi was not trained directly. However, Kanzi was observed to start to use the symbols spontaneously, for example, pressing a food symbol and then going to the food machine, and pressing the symbol for ‘chase’ to start a game of chase. Kanzi was then separated from his mother and seemed to prefer human company. After his sister Mulika was born, Kanzi enjoyed her company and Mulika saw Kanzi using the lexigram. In contrast, Sherman and Austin were trained to sue the lexigram in teaching sess ions, whereas although people modelled the use of the lexigram with Kanzi and Mulika, they were never actually taught.

At the end of the period covered by the report, Kanzi and Mulika were formally tested on all the words in their vocabulary. This was don e formally to ensure that their performance was not due to contextual clues or inadvertent glances. They were tested by (a) being shown photographs and then asked to select the right lexigram, or (b) listening to a word or a synthesised version of the word and then being asked to select the right photograph or lexigram.

d) Outline on advantage and one disadvantage of the research method used in your chosen study. (6)

A case study is a used to collect in depth data on one or a small number of participants and usually takes place over a long period of time.

One strength of this method is that it allows researchers to see developments over time. This is a strength because cognitive processes such as learning a language take time to develop, and this could no t be recorded in a snap shop study. For example, in the study by Griffiths Kanzi was first exposed to the lexigram at 6 months, but it was another 12 months before he showed an interest by pressing the symbols himself when he showed he has learned the association between the lexigram and the food machine. At this point he did not use specific symbols for specific foods however, and it took more time before Kanzi demonstrated this skill. In this case the case study method is ideal because it records data ove r along period of time. It also means that a large amount of data is gathered on each subject, so the development of the cognitive process being studied is clearly recorded.

One weakness of the case study approach is the potential for researcher bias. This is problematic because it means that the results recorded may not be a true reflection of what is actually happening; the researcher becomes so involved in the project that they lose their objectivity. In this case it could mean that researchers were mi sinterpreting Kanzi's gestures so that it seemed Kanzi understood more lexigrams than he did. Savage -Rumbaugh was very careful to avoid accusations of subjectivity by using independent researchers and stringent vocabulary acquisition criteria i.e. spontane ous utterances that could be verified nine times out of ten by behavioural concordance. However, Savage -Rumbaugh worked extensively with the chimpanzees and is heavily invested in the project; bias is still a possibility.

e) Outline the results of your chosen study. (8)

Kanzi was first observed using the lexigram at two and half years when his mother Matata left to take part in a breeding programme. Mulika started using the lexigram much earlier (12 months) although it took until about 14 months before sh e was using symbol appropriately such as melon, Matata and go. When chimpanzees first used a word it was in an associative context e.g. he first heard the word strawberries it was in

the ‘mushroom’ site, and he then at first he only used ‘strawberries’ at the ‘mushroom’ site. Eventually this was extended to context-free situations.
Over the course of the 17 months which are the focus of the report kanzi acquired 46 words and Mulika 37. Kanzi appeared to learn more quickly than Mulike initially, but this is probably because he had already learnt some lexigrams while with Matata that he produced once he was using the lexigram. It is thought that comprehension preceded production in 63% of cases.
One of the key characteristics of human language is the ability to combine words to produce novel meanings. Kanzi used multisymbol utterances quite early but they were far fewer than single symbol utterances. Kanzi produced 2,540 spontaneous non-imitative combinations, all but ten of these were judged to be appropriate and understandable. Kanzi’s utterances frequently related to games (e.g. chase bit person). Like human children Kanzi and Mulika imitated most often when they were learning new words. The proportion of imitated spontaneous utterances were similar to children’s – 15% of utterances were imitation and 80% were spontaneous.
Kanzi and Mulika did well on the formal tests- they were able to select photographs when prompted with the lexigram, and vice versa. They were also able to do this prompted by the spoken word. Sherman and Austin were initially confused by the formal tests because they anticipated receiving the object once they had identified it.
When Kanzi was about 3 years old a ‘blind’ test was arranged with a researcher who had never been in the forest area and so could give Kanzi no cues. Kanzi was able to direct the visitor to relevant locations. Mulika did not do this as she was unwilling to travel without Kanzi at the time of the report.

f) Outline two possible changes to your chosen research and explain the possible implications for the study. (8)

One possible change to the study would be to increase the sample size because only 4 apes were studied, and this is not enough to generalise to other chimpanzees. It might be that the chimpanzees in the study were particularly intelligent, for example. Instead Savage-Rumbaugh might study ten chimpanzees of each species (pygmy and common). If the results were reliable (consistent) then it would seem more reasonable to generalise them to other chimpanzees. However, the implications of this change are considerable. It would require many more researchers and the research centre would need to be much larger to house the chimpanzees. This would be very expensive, and perhaps impractical. It might also be unethical to use chimpanzees in this way, and increasing the number of chimpanzees increases the number who are being treated unethically. It would also increase the amount of data to be collected and analysed.
The number of lexigrams learnt by the chimpanzees might decrease because Kanzi and Mulika might be particularly intelligent chimpanzees. Also if the common chimpanzees and the pygmy chimpanzees are raised in the same learning environment from the same age, then the differences between the two species might not be as evident. The common chimpanzees might perform as well as the pygmy chimpanzees.

To ensure that all the results are free from bias the study should have completely independent researchers. Although there were independent observers, there was still a lot of work done with Kanzi done by Savage-Rumbaugh. This means that it is possible there is some misinterpretation of Kanzi’s gestures. If completely independent researchers were employed it is possible that some more of Kanzi’s utterances would be judged incomprehensible, or incorrect. For example, “chase bit

person" does not seem particularly comprehensible to an outsider, whereas it might be to someone who is involved in the research.