Week 2: Language as an instinct

Solutions

(1) Read the following description of a feral child named Victor and answer the questions below:

Victor was found in France in 1797 when he was twelve or thirteen years old. He had no speech when he was found. However, his hearing was normal and he made some noises. A man named Jean Marc Gaspard-Itard spent five years trying to teach Victor language. When Victor was sixteen, he could name objects. However, he would never use the words to request the objects. He also applied each word to only one object. That is, he would call only a certain shoe a shoe, but not other shoes. Victor developed no grammar.

i. Does Victor's case support the critical period hypothesis? Why or why not?
ii. What factors other than a critical period could be responsible for Victor's not acquiring normal language skills?

Solution
i. Yes, Victor's case supports the critical period hypothesis. Victor was discovered after the critical period (puberty) and though he was able to name objects and communicate (like Genie), he did not fully acquire the grammar (also like Genie) even after years of trying. Contrast this with Isabelle who was discovered before the end of the critical period (6.5) who developed grammar normally after only 1.5 years.

Ii. Because Victor was not found until he was 12 and did not have any language, he was likely isolated from other humans and neglected. This means he may have other social or cognitive impairments that could contribute to his inability to acquire language.

Note that answers will vary and other answers could be correct. With this question we are trying to find out whether you (1) know what a critical period is, (2) know what we should expect from a child who begins learning language either before or after the critical period, and (3) if you know that a child who is deprived of language due to abuse or neglect is likely to have other developmental issues.

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(2) In class we discussed Lenneberg's characteristics of biologically-determined behavior. Here is a summary adapted from next week's reading:

(a) The behavior emerges before it is necessary
(b) Its appearance is not the result of a conscious decision

(c) Its emergence is not triggered by external events (though the surrounding environment must be sufficiently "rich" for it to develop adequately).
(d) Direct teaching and intensive practice have relatively little effect.
(e) There is a regular sequence of "milestones" as the behavior develops, and these can usually be correlated with age and other aspects of development.
(f) There is likely to be a "critical period" for the acquisition of the behavior.

Choose 5 of the 6 characteristics above and use them to compare walking to bike-riding.

Solution

(a) Children learn to walk before they need to — their parents still can and do carry them around and provide for their needs. Bike riding isn't necessary for survival.
(b) Children take steps toward learning to walk without having to decide they should, but nobody learns to ride a bike unless they (or their caregivers) choose to.
(c) There is no specific trigger for walking — children will walk according to the milestones as long as they are afforded the chance; but it's much less likely that a child would learn to ride a bike just by handing them one; usually they need some encouragement or someone has to decided to teach them how.
(d) Someone showing you how to ride a bike and intensive practice doing it would have a huge impact on bike riding ability, but these things have little impact whether a child walks.
(e) Walking follows a set sequence that does not differ (much) by child: at a certain age they set themselves on a path to do it; but there are many paths one can take to learn how to ride a bike (some kids use training wheels, other balance bikes, etc) and many very distinct ages at which children learn (some at 2, some not until adulthood!)
(f) If you haven't learned to walk before the critical period, you might have a hard time becoming fully competent at the skill, but adults can still learn to ride a bike late in life.

Note that there are many possible answers here. With this question we are wondering whether you know that walking seems like an innate behavior (follows Lenneberg's criteria) but riding a bike does not.

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(3) Many behaviors in humans and other animals result from a combination of instinct and learning/culture. Choose one human and one animal behavior to describe in these terms: which aspects of the behaviors are instinct and which parts are learned?

Solution

Human answers could include:
- Eating: Chewing and swallowing are an instinct but cooking is learned/cultural
- Dating: Mating is an instinct but romance is learned/cultural
- Language: All humans have an instinct to learn language but the specifics are learned
- More!

Animal answers could include:
- Hunting cats: hunt and chase are instinct, but kill and eat are learned

- Border Collie Herding: The drive to herd is instinct, but the thing they herd is learned (they won't herd sheep if they grow up around them, they'll imprint instead)
- Chimp ant dipping: Eating the ants seems like an instinct but they way they do (different approaches) is learned.

Note that many answers are acceptable here. We want to know whether you understand that some things are innate (biologically determined) but other aspects are learned/cultural.

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(4) The following data is from a study that asked children to mark tense by completing sentences like "*Everyday I walk to school. Just like everyday, yesterday I _____*". Children in the study were either impaired or controls, and spoke one of five languages.

Table 1. Ability to produce tense marking (% correct)

% correct	English (England)	English (Canada)	French (Canada)	Japanese	Greek
Impaired	38.3	52.3	46.7	48.1	20.0
Controls	91.7	93.5	96.4	97.9	87.1

Subjects were given items like: Everyday I walk to school. Just like everyday, yesterday I.... *This task requires the subject to recognize that the temporal context specified in the second sentence requires a particular verb form.*

Based on this data, what type of impairment do you think the researchers are studying? Do you think the impaired group of children had a hemispherectomy, Williams Syndrome, or SLI? Explain why.

Solution
The researchers are studying Specific Language Impairment. Children with SLI are known to struggle with tense learning. Children with Williams Syndrome and hemispherectomies are known for their surprisingly strong language skills!

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(5) The following data (from Reilly, Klima & Bellugi, 1990) show responses from four children asked to describe a scene in the book *Frog Where are You?* All of the children have an IQ score of between 48-64. Just by looking at the data and without referring to the paper:

(a) Write group 1 next to the answer that best describes the group 1 children (1 & 3) and group 2 next to the answer that best describes the group 2 children (2 & 4)?

(i) Williams Syndrome
(ii) SLI
(iii) Hemispherectomy

(iv) Down Syndrome
(v) Control Group

(b) Explain your answer choices.

Group 1 **Group 2**

(M. Mayer, "Frog Where are You")

1 **age 13**
And he was looking for the frog. What do you know? The frog family! Two lovers. And they were looking. And then he was happy 'cause they had a big family. And said "good bye" and so did the frog. "Ribbit."

2 **age 13**
There you are. Little frog. There another little frog. They in that... water thing. That's it. Frog right there.

3 **age 17**
Suddenly when they found the frogs... There was a whole family of frogs... And ah he was amazed! He looked... and he said "Wow, look at these... a female and a male frog and also lots of baby frogs". Then he take one of the little frogs home. So when the frog grow up, it will be his frog... The boy said "Good bye, Mrs. Frog... good bye many frogs. I might see you again if I come arounmd again". "Thank you Mr. Frog and Mrs. Frog for letting me have one of your baby frogs to remember him".

4 **age 18**
Thy're hiding; see the frogs... the baby frogs. Uh, the boy, and, and the dog saw the frogs. The frog's got babies. The boy saw the... no, the boy say good bye.

(Reilly, Klima & Bellugi, 1990)

Solution
Group 1 (1&3) are children with Williams Syndrome.
Group 2 (2&4) are children with Down Syndrome.

The children all have low IQ, which rules out the SLI, Hemispherectomy, and Control Group answers - all of these groups are known to have normal IQ. Among children with low IQ, children with Williams Syndrome are known to have strong language skills while children with Down Syndrome are known to have some issues with language, particularly trouble with syntax and morphology.