



Attachment Research: Animal Studies

This **Psychology Factsheet** covers **attachment** research in the form of animal studies. The Factsheet includes **Exam Hints**, and the worksheet gives you the opportunity to apply what you have learned to exam-style questions. Words in **bold** are explained in the glossary and there is a reference list at the end.

The examiner will expect you to be able to:

- Describe animal studies of attachment.
- Outline key theories of animal attachment.
- Evaluate animal studies of attachment.
- Apply animal studies of attachment to theories of human attachment.

A. Introduction



An attachment is a two-way emotional bond between a caregiver and infant, characterised by behaviour such as **proximity-seeking**. These early relationships have been studied extensively in psychology, with famous psychologists like John Bowlby and Mary Ainsworth producing influential research to try and understand the

formation of these relationships in humans and their impact on later development. Ainsworth's **Strange Situation**, for example, measured children's attachment type with their caregiver through a series of carefully controlled social situations. However, human research such as this is limited, as it relies on testing existing attachment bonds, due to the **ethical issues** associated with researchers seeking to deliberately control, change or even restrict attachment bonds in human offspring at this early stage of development. Perhaps this is one reason why many researchers became interested in using **non-human animals** to study attachment, where there are fewer restrictions on what researchers can do to understand these crucial early relationships and experiences.

In the 1930s, Konrad Lorenz became an early pioneer in animal studies of attachment, working primarily with birds. Lorenz was an Austrian researcher who is often regarded as one of the founders of modern **ethology**, which is the study of animal behaviour. He is perhaps best known for his work with greylag geese, in which he studied the principle of **imprinting**, the process by which some birds instinctively bond with the first moving object they see within hours of hatching.



Later, in the 1950s, Harry Harlow began his famous, and highly controversial, research using rhesus monkeys. This work sought to better understand precisely which aspects of a caregiver were the most important to infant monkeys in a variety of situations. Lorenz and Harlow became extremely influential, being ranked 65th and 26th respectively in a list of the most eminent psychologists of the 20th century, much higher than Ainsworth who ranked in 97th place (Haggbloom, 2002).

Exam Hint: The fact that Harlow and Lorenz (who studied animals) were both ranked much higher in a list of the most eminent psychologists than Ainsworth and Bowlby (who studied humans) could be used as an evaluation point for the work of both researchers to demonstrate the influence animal research has had in the field of attachment.

B. Lorenz's geese

Lorenz (1935) aimed to observe the formation of attachment (through imprinting) in greylag geese. To do this, he took a clutch of gosling eggs and divided them into two groups. One group was left with their goose mother and the other group was placed in an **incubator**. When the incubator eggs hatched, the first moving thing they saw was Lorenz, and they soon began to follow him around. Lorenz then tested the effect of imprinting by giving the young goslings a choice of 'parents' to follow. He marked the two groups of goslings to distinguish between those who had seen their natural mother after hatching and those who had seen Lorenz after hatching, before placing them all together with both himself and the natural mother. Given the choice of both 'parents', Lorenz found that the goslings quickly divided themselves up, one group following their natural mother and the other group following Lorenz.



The goslings who had first seen Lorenz after hatching showed no recognition of their natural mother, as Lorenz had become their 'imprinted parent'.

Lorenz noted that the process of imprinting is restricted to a specific period of time, which he called a **critical period**. If the offspring is not exposed to a persistently moving object within the first two days after birth, it will not imprint and therefore will fail to form an attachment. He concluded that animals imprint a mental image of the first moving object they see immediately after being born and that the process of attachment is an instinctive one.



Lorenz (1952) went on to note a number of further features of imprinting. The geese who had imprinted an image of Lorenz in their critical period went on to follow him around everywhere he went through their early life and into adulthood, walking and

swimming wherever he went. He described how one of these geese slept on his bed every night. Lorenz concluded that the process of imprinting is irreversible and long-lasting.

Furthermore, Lorenz noted that this early imprinting also impacted on mate preference in later life. This is known as **sexual imprinting**; the idea that animals (particularly birds) will select their mate in the image of their imprinted parent. However, Lorenz also noted that imprinting to humans does not appear to happen in some animals. Curlew birds, for example, would not imprint on a human.

Exam Hint: Many students describing Lorenz's study in exams simply outline the way the goslings followed Lorenz everywhere and miss out many important procedural details, such as the use of an incubator and the marking of the goslings prior to giving them a choice of parent to follow. These details are vital for the highest marks.

C. Evaluation of Lorenz's attachment research

Lorenz's research using non-human animals had a strong influence on those interested in human attachments too. In the 1950s, John Bowlby was heavily influenced by his work with goslings, and the idea that attachments were the result of an evolved, instinctive drive rather than learning, as had been proposed previously. Bowlby's ideas, in turn, influenced the young researcher Mary Ainsworth.

Lorenz's finding that the goslings experienced imprinting soon after hatching has since been developed by **Hess (1958)** who showed that while imprinting could occur as early as one hour after hatching, the strongest responses occurred between 12 and 17 hours after hatching, and that after 32 hours the response was unlikely to occur at all. This further develops and refines Lorenz's theory of imprinting.

However, Lorenz's research has been criticised for only giving the goslings one opportunity to 'choose' their imprinted parent before concluding this process was irreversible with a long-term effect on reproductive behaviour. Later research, such as that conducted by Guiton (outlined below), has suggested these effects might be reversible if given further opportunities to socialise with members of their own species.

Exam Hint: Candidates often assume that evaluation must include strengths or limitations, but that is not always the case. Evaluation can also refer to alternative research that develops the findings or conclusions of the original study further, for example by exploring a particular part of the research in more depth or detail, or reference to research which refutes the findings of the study under discussion.

D. Guiton's chicks

Guiton (1966) tested imprinting in leghorn chicks by exposing them to a yellow rubber glove during their critical period, which was used to feed them during the first few weeks after hatching. It was found that the chicks became



imprinted on the gloves. This supports the view that, while some young animals are born with the instinct to imprint during the critical period, they are not born with any predisposition to imprint on a specific type of object and will imprint on *any* moving thing that is present at this time.

Furthermore, Guiton found that the male chickens went on in later life to try to mate with the gloves, supporting Lorenz's theory of sexual imprinting.

However, Guiton also found that he could reverse the process of imprinting in chickens who had initially tried to mate with the rubber gloves. He allowed the birds to spend some time with their own species (something Lorenz did not do with geese) and, after this, they were then able to engage in normal sexual behaviour with other chickens.

Exam Hint: When asked to discuss Lorenz's research, it is important to be able to discuss both sides of an argument for the highest evaluation marks. The Guiton study is useful to include in your evaluation as it offers an excellent opportunity to demonstrate this kind of discussion as it has elements which both support and contradict Lorenz's conclusions.

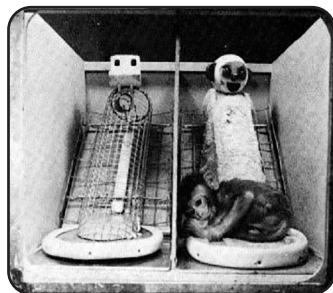
E. Evaluation of Guiton's attachment research

Guiton's research develops Lorenz's findings further by demonstrating that not only do many birds *not* have any specific predisposition to imprint on members of their own species (as shown by Lorenz), but also that the imprinted parent can be any moving object, even a rubber glove. This shows just how indiscriminate this process is.

Guiton's research also contradicts one of Lorenz's key conclusions. Guiton's findings suggest Lorenz's idea that imprinting is irreversible may not be accurate and it is now thought to be a more plastic mechanism.

F. Harlow's monkeys

Harlow (1959) conducted his research on eight newborn rhesus monkeys who were separated from their mother after birth. They were then given the choice of two wire mothers, one consisting solely of exposed wire, while the other was wrapped in soft cloth. For four of the monkeys, there was a milk bottle on the cloth-covered mother, while for the other four monkeys, the milk bottle was on the wire mother. Observations of the monkey's responses were made for 165 days and Harlow measured the amount of time the monkeys spent with each of the two 'mothers'. He found that all eight monkeys spent most of their time with the cloth-covered mother, whether or not this monkey had the milk bottle attached. The four monkeys who experienced the milk bottle with the wire mother spent only a brief amount of time feeding from the wire mother before returning to the cloth mother.



Harlow then used a mechanical creature which consisted of an apparatus with flashing eyes, loud, moving teeth and arms, designed to deliberately frighten the monkeys to see which 'mother' the monkey would run to when afraid. All of the monkeys ran to the cloth-covered mother when frightened and clung to it for security. He also released the monkeys into a novel environment which contained various new objects,

including the cloth-covered mother. In this situation, the monkeys commonly kept one foot on the cloth-covered mother, seemingly for reassurance. It was concluded that the monkeys valued contact comfort above the ability of the mother to provide food.

Like Lorenz before him, Harlow also found long-lasting effects of the early experiences of the animals studied. All the orphaned monkeys, including those who experienced contact comfort, developed abnormally. Socially, the monkeys did not appear to know how to behave around other monkeys, either freezing or fleeing when other monkeys approached them. Sexually too, they showed abnormal mating behaviours. When Harlow **artificially inseminated** some of the monkeys to observe their behaviour as a parent, they did not cradle their own babies.

There also appeared to be a critical period. Harlow showed how the monkeys were able to recover, but only if they were allowed to socialise with other monkeys before they were three months old. Those who were deprived of contact with other monkeys until they were six months old, for example, did not seem able to recover.

Exam Hint: When describing Harlow's research, it is important to refer to some of the procedural variations he used to investigate attachment, such as the use of a mechanical creature and a novel environment.

G. Evaluation of Harlow's attachment research

A big issue with Harlow's research is that it raised major ethical issues as it caused lasting psychological and emotional harm to the monkeys involved. Another criticism of Harlow's research related to his use of a different 'head' on each 'mother' which may have given the cloth-covered 'mother' a more appealing appearance to the infant monkeys. This therefore may have been the reason that monkeys chose one mother over another, which questions the **internal validity** of the study.

However, Harlow's research has valuable **implications**. For example, we now understand the importance of contact comfort from attachment figures for baby monkeys in zoos and breeding programmes in the wild. This is a strength because this research has benefitted animals in the real world.

Support for Harlow's findings on contact comfort have come from research on rats. **Jutapakdeegul et al (2017)** found that touch during infancy resulted in a decrease in the stress hormone **corticosteroid**, showing the stress-relieving impact of contact in infancy.



Furthermore, there is support for some of Harlow's findings from human research into **privation** (or a lack of attachment formation). For example, studies of Romanian orphans from the 1990s have supported the idea of lasting psychological and emotional damage if children are denied consistent contact with a caregiver beyond the age of six months (Rutter and Sonuga-Barke, 2010). This suggests elements of Harlow's research may provide useful insights into the way an attachment (or lack of attachment) impact on humans too.

However, a disadvantage of all animal studies of attachment is that the findings are difficult to generalise to humans. For example, much more of human behaviour is governed by conscious decisions, unlike animals such as geese, chicks and monkeys. This is a problem because we cannot assume that animals and humans form complex emotional bonds in the same way. Therefore, more research is needed to aid our understanding.

Exam Hint: If discussing both Lorenz and Harlow's research in one extended essay, it is beneficial to conclude with more general evaluation which applies to Lorenz, Guiton and Harlow's research in order to bring together the separate strands of the essay, as the final paragraph above demonstrates.

H. Conclusion

There can be no doubt that animal studies in attachment have had a huge influence on our understanding of attachment. While humans may not demonstrate the same behaviours as certain species of non-human animal, such as imprinting, there are many similarities that can be drawn. Animal studies of attachment have also proven particularly useful to those working in the conservation of natural habitats and the care of animals in captivity. Despite the obvious differences between different species of animal, studies of humans and many non-human animals do tend to agree on the vital importance of very early attachment experiences in our long-term development.

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Glossary

Artificially inseminated: Deliberately impregnating a female using the sperm of a male by means other than sexual intercourse.

Attachment: A two-way emotional bond between a caregiver and offspring that endures over time.

Corticosteroid: A steroid hormone produced in the adrenal cortex of vertebrates involved in a range of processes including the stress response.

Critical period: A window of time in the early life of an animal in which it is argued an attachment must be formed.

Ethical issues: Problems that arise in research which compromise the moral principles that govern that field of study, such as psychology.

Ethology: The scientific study of animal behaviour, usually with a focus on behaviour in natural conditions, and viewing behaviour as an evolutionary trait.

Implications: The conclusions that can be drawn from something even if it is not directly stated.

Imprinting: The instinctive drive to form an attachment with the first moving thing the offspring sees soon after being born.

Internal validity: Whether the research measured what it intended to measure.

Non-human animals: All animal species except for humans.

Privation: The lack of an attachment bond e.g., due to neglect.

Proximity-seeking: Behaviours which decrease the distance between the offspring and the caregiver.

Refutes: Contradicts or goes against.

Sexual imprinting: The tendency of an animal to seek a reproductive mate based on how similar in appearance they are to their imprinted parent.

Strange Situation: The name of a methodology which uses a series of situations involving an infant, their caregiver, and a stranger, to categorise the attachment type of the infant.

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Worksheet: Attachment Research: Animal Studies

Name: _____

1. Outline one study of attachment using non-human animals.

2. Explain one strength and one limitation of this study.

3. Explain what is meant by imprinting.

4. Outline one piece of research which supports the idea of imprinting in animals.

5. Explain the limitations of using animal studies to understand human attachment.
