# Hassett et al. (2008)

## Aim

- To test if sex differences in children's toy preferences are due to biological factors (i.e. exposure to high levels of prenatal androgen) rather than socialisation.
- To investigate whether male and female rhesus monkeys have similar toy preferences to human children despite having no experience socialising with human toys.

## Introducing Kim Wallen and Janice Hassett-Vick

Professor Wallen has worked with monkeys for over 50 years, at Emory University and the Yerkes National Primate Research Centre (YNPRC).
Hines and Alexander found that male vervet monkeys played more with stereotypical male than female toys. Wallen investigated whether monkeys showed a preference for sex-typed toys when given a choice between stereotypical male and female toys. He found that the behaviour of monkeys paralleled that of children using a toy-preference task, suggesting that toy preferences are not primarily a result of socialisation, but rather are due to biological differences.

## Psychology Being Investigated

The psychology being investigated is animal **play.**
Play = Seashore (1913) defined play as 'pleasure gained in self-expression'. This definition may apply to some forms of human play, but it does not describe non-human animal play very well as animals do not really have a sense of self to express!
Animal play = Bergen (2015) emphasises that play is always voluntary, explaining that we play because we choose to, not because we have to. Play may be adaptive, and it can help individuals practice skills required for adulthood.

## Sex Differences and the Role of Nature

The sex of mammals is determined by sex chromosomes which affect their levels of sex hormones, typically XX for females and XY for males. This causes differences in the development of male and female brains, and consequently, their cognitive processes.
In a nursery, boys are more likely to be seen playing with cars, and girls with dolls. However, this doesn't mean that girls don't like playing with cars; in fact, research found that girls like playing with trucks more than boys like playing with dolls.

## Nature vs Nurture Debate on Toy Preferences

Nurture debate: Children learn about gender and societal norms through socialisation, leading them to conform to stereotypical gender roles, and seek out sex-typed toys.
Hassett et al., however, reject the socialisation explanation for toy preferences and believe in the biological explanation.
Nature debate: Boys and girls play with toys which suit their cognitive abilities, and these depend on each child's sex hormone levels. Hence, toys are selected due to the play activities they promote, not due to societal norms on 'gender-appropriate' toys.

## Background

**Congenital Adrenal Hyperplasia (CAH)** = An inherited condition where the foetus is exposed to high levels of prenatal androgens (male sex hormones).

Hassett et al. were influenced by research on children with Congenital Adrenal Hyperplasia (CAH). Subsequently, it led them to favour the idea that toy preferences are initially shaped by hormones and not socialisation. Research shows that girls with CAH show a preference for male-stereotyped toys when compared to girls without CAH. Additionally, Pasterski et al. (2005) found that even when daughters with CAH were encouraged to play with female-stereotyped toys, they still preferred playing with male-stereotyped toys.

**Previous Research on Monkeys**
Alexander and Hines (2002) found the following:

1. More male vervet monkeys than females played with stereotypically male toys.
2. Unlike humans, male monkeys spent an equal time interacting with male and female toys.
3. Female monkeys showed a strong preference for stereotypical female toys rather than male toys.

**Research Method, Design and Variables**
Research Method ➜ Field experiment involving a controlled observation, and a correlational study using a behavioural checklist.
Research Design ➜ Independent measures design.
Independent Variable ➜ The sex of the monkey (male or female).
Dependent Variable ➜ Whether the monkeys interacted more with the plush toys or the wheeled toys.
When the monkeys interacted with the toys, their social rank and age were recorded. *Social rank* had already been determined by observing grooming behaviour; the monkey doing the grooming is always subordinate has less social status than the monkey being groomed.

**Sample**:

- Originally, 135 monkeys were from the Yerkes National Primate Research Center Field Station, but 53 were excluded, hence only 82 took part ➜ 61 females and 21 males.
- There were infant and adult monkeys.
- 34 monkeys (23 females & 11 males) interacted with the toys on more than 5 occasions, therefore, their data was included in the analysis.
- Reasons for excluding the 53 monkeys:
    - 14 had previously participated in research on prenatal hormones so they weren't included in the current study (to reduce demand characteristics and order effects).
    - 39 were excluded since they were too young, and it was hard to tell their sex.

**Procedure**
Seven 25-minute trials were completed in the outdoor enclosure, each with a different pair of toys. Before each observation, observers placed a pair of toys (1 wheeled, 1 plush) outside while the monkeys waited inside. Toys were placed 10 metres apart and their positions were counterbalanced (to ensure the monkeys didn't prefer a certain area of the enclosure).

The toys varied in shape, size, and colour, and were selected on what you could 'do' with them. There were:

- 6 wheeled toys: wagon, truck, car, construction vehicle, shopping cart and dump truck, ranging from **16 to 46 cm.**
- 7 plush toys: Winnie-the-Pooh, Raggedy-Ann, Scooby-Doo and four soft toy animals, including a koala, armadillo, teddy and turtle, ranging from **14 to 73 cm.**

**Data Collection** = A video camera was focused on each toy to record interactions. 2 observers watched the videos and used a behavioural checklist to categorise the behaviour of the monkeys. They recorded the data using the app Handobs on their palm pilots (a device similar to mobile phones).

Data recorded by observers: The start and finish time of each interaction, and from this they calculated the duration. The monkey's age, sex, and rank.
Behavioural checklist included: extended touching, holding, sitting on, dragging, carrying, etc.
Examples of operationalised behaviours:

- Extended touch – Placing a hand or foot on the toy.
- Sit on – Seated on the toy or a part of the toy.

**Results**
Most monkeys didn't interact with the toys. Only very few interacted frequently and for long. Data of (17 - 3 males and 14 females) monkeys who showed less than 5 behaviours were excluded.

- Male monkeys played with wheeled toys for a longer time than female monkeys. However, the standard deviation was high, meaning that some males played for longer than others.
- Female monkeys played with plush toys for a longer time than male monkeys. There wasn't a significant difference in time spent playing with wheeled or plush toys.
- Social Rank – A significant positive correlation between social rank (dominance of monkeys) and frequency of interaction was found.
  - Higher-ranking monkeys interacted more with the toys.

- Female monkeys who preferred plush toys had a higher rank than those who had no preference.

**Results - Male Monkeys**

- Male monkeys preferred wheeled toys (mean = 9.77), compared to plush toys (mean = 2.06). Males played with plush toys less than females.
- 73% of males preferred wheeled toys and only 9% preferred plush toys. 18% showed no significant preference. These preferences were not affected by age or rank.

**Results - Female Monkeys**

- Female monkeys showed no preference, other than an insignificant preference for plush toys. Mean plush toys preference = 7.97. Mean wheeled toys preference = 6.96.
- Only 30% of females preferred plush toys, whereas 39% preferred wheeled toys, and 30% showed no significant preference.

**Conclusions**

1. Sex-typed preferences in humans may be due to biological differences because even without differences in socialisation, monkeys showed preferences similar to human infants.
   Male monkeys similar to boys, have a strong preference for masculine-type toys.
   Whereas female monkeys are more variable in their toy preferences.
2. Toy preferences reflect behavioural and cognitive biases which have been influenced by hormones.

**Strengths**

1. Ethical guidelines on treating lab animals were followed by researchers when caring for the monkeys. They had constant access to water, they were fed monkey chow twice a day, and fruits and vegetables every day.
2. Using the operationalised behavioural checklist increased the validity and reliability of results, as it guided researchers on how to record observations in the same way. For example, the behaviour 'sit on' was described as sitting on or part of a toy.
3. Different pairs of toys were used on each trial, and this increased the validity as we can determine that males were drawn to wheeled toys in general, and not just a specific wheeled toy.
4. Using video cameras increased the validity of the data recorded because the monkeys were used to the cameras. If a researcher recorded data in person instead, the monkeys might show demand characteristics by playing more or less with the toys.
5. Quantitative data collected on toy interaction duration allowed for the objective calculations of the average time the monkeys spent with the toys. This removes room for subjective interpretations.

**Weaknesses**

1. The standardised procedure was abandoned for a trial because a monkey tore a plush toy causing the trial to be stopped 7 minutes early. This reduces the reliability of results.
2. There is a chance observer bias may have increased subjectivity. The researchers who analysed the tapes were familiar with the monkeys and their gender and this could have led them to unintentionally code the behaviour of the monkeys differently to their actual behaviour.
3. There was a lack of adult males in the sample, hence reducing the generalisability of results. The only one high-ranking male didn't interact with any toys, hence, findings can only be generalised to lower-ranking, non-adult male monkeys.
4. Ecological validity is low because the sample consisted of monkeys in captivity, and they might be more likely to show interest in new objects in their environment. Therefore, we can't entirely generalise results to explain if wild monkeys behave in the same way.
5. Validity is low because, in each trial, a group of monkeys were sent out. So if one monkey occupied the wheeled toy, another monkey wanting to play with a toy would go to the plush toy regardless of their personal preference.

**Nature vs Nurture**

Hassett believed that toy preferences in humans are due to nature because male monkeys prefer wheeled toys over plush toys, whereas females show no clear preference.
Findings supported the nurture debate that interactions were affected by social rank. Female monkeys' social rank was positively correlated with the time spent interacting with both toys. However, female dominance is influenced by testosterones which is a biological effect.

**Applications to everyday life**

Findings are helpful when choosing toys for children. Results suggest that boys like moving toys, so if a parent wants to develop their empathy, toy vehicles with expressive faces can be bought. As girls like plush toys with faces, their visuospatial skills can be improved by using toys with moving parts but in a context where dolls are included. For example, playing a scene with toy school buses and dolls.