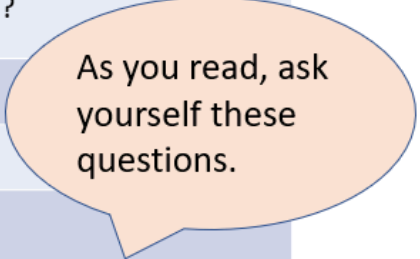


### Critical thinking exercise.

In your university studies you need to be able to describe and summarise the key points from studies, theories and explanations. You need to be able to show the reader how different studies and theories can be pulled together as supporting and complementing one another and also in making criticisms. Copied below is the slide from our critical thinking lecture where I asked you to answer these questions while reading the account I offer on a seminal study and the explanation of behaviour it is associated with. This is an optional exercise. It is not assessed or marked but it is an opportunity for you to start your journey as an independent learner.

What is the context (author, date, source-type) and why is it important?	
What is the main argument, conclusion or recommendation?	
What are the minor conclusions or key points made?	
What are the measurable or observable facts (evidence)?	
Does the evidence support the argument fully or partially?	
Were the methods used reliable and valid?	
Is there any bias or are any assumptions made?	
How does this information compare with that from other sources?	

### Evaluating behaviourism – Learning without reinforcement

#### The influence of role-modelling on behaviour

The focus of operant conditioning is on how behaviour is shaped or learnt through direct reinforcement and punishment. Skinner (1965), who tested this type of conditioning in his research with pigeons and rats, concluded that behaviour is largely the result of this type of conditioning – behaviours that bring a reward will increase and those associated with an aversive or punishing experience will stop.

Bandura, a social psychologist, argued that learning involved more than just associating behaviour with rewards and punishments. Behaviour is shaped through social interactions. This can be as a consequence of reinforcement and punishment (the Skinner view), *and* it can occur by observing and copying the behaviour of a role-model. This is known as **social learning theory** and was illustrated in a seminal study by Bandura, Ross and Ross (1961) and known throughout psychology as the Bobo doll study. The researchers obtained 72 children aged three to almost six years of age. Half were boys and half girls. The children were recruited from the Stanford University Nursery School. Twelve boys and twelve girls were separately exposed to an adult role-model behaving aggressively towards a five-foot tall, large, inflated Bobo doll. Another group, the same in size and gender mix, were exposed to a model who did not behave aggressively towards the Bobo doll and the third group were the control group, they were not exposed to any role-model.

As we have different children in each group you might rightly raise the issue of individual differences across conditions. That is, some of the differences in the subsequent behaviour of the children could be attributed to individual factors separate from the influence of the model. Bandura et al (1961) limited this influence by obtaining ratings on aggression from an experimenter and teacher who knew each child. They were rated on their physical aggression, verbal aggression and aggression towards objects. This enabled the researchers to match the children across the groups on aggression levels.

On the day of the test, it was arranged that each child was taken to the experimental playroom where it was rigged that they passed an adult who was invited to join the game. The child was sat at a table that included a number of toys and the adult sat at a different table that included a tinker toy set (a popular construction toy made of wooden spools and sticks), a mallet and the Bobo doll.

In both the (aggressive and non-aggressive) experimental conditions the adult began to assemble the tinker toys but after one minute, in the aggressive condition, the adult began to act violently towards the bobo doll. The adult laid the doll on its side and sat on it and punched it repeatedly on the nose: 'The model then raised the Bobo doll, picked up the mallet, and struck the doll on the head. Following the mallet aggression, the model tossed the doll up in the air aggressively and kicked it about the room. This sequence of physically aggressive acts was repeated three times, interspersed with verbally aggressive responses such as 'Sock him in the nose...', 'Hit him down...', 'Throw him in the air...', 'Kick him...', more' and 'He sure is a rough fella' (Bandura et al, 1961, p.576)

This continued for ten minutes and then the researcher returned and the adult said goodbye and left. In the non-aggressive condition, the adult played the whole time with the tinker toys. Each child was then taken to another playroom that contained several very attractive toys – a fire engine, a jet fighter, a complete doll set and wardrobe, a doll carriage etc. They were allowed to play with these toys for only a short period. They were then told that these toys had been reserved for other children, but they could play with the toys next door. This phase was added to induce frustration in the children. In the room there was a mix of 'aggressive toys' – the bobo doll and mallet, two dart guns and a tether ball with a face painted on it; and non-aggressive toys e.g. a tea set, crayons and paper, a ball, dolls, cars and a truck and plastic farm animals. Each child was left to play for twenty minutes, and their behaviour was recorded from researchers behind a one-way mirror. Half in both the experimental conditions were exposed to a same-sexed model and half an opposite sexed model.

On measures of aggression the researchers scored how often the child imitated the specific aggressive acts of the model (i.e. sitting on the doll, punching it on the nose, hitting it with the mallet, kicking it and throwing it); the child's verbal responses were recorded e.g. how often they said 'sock him; 'Hit him down', 'pow' etc., then any aggression towards toys other than the doll was scored and finally any aggression shown by the child which was not a copy of the model's behaviour.

**Table 1 Mean number of aggressive acts by children in each condition**

Type of aggression	Type of model				
	Aggressive male	Non-aggressive male	Aggressive female	Non-aggressive female	Control group
Imitative physical aggression					
Boys	25.8	1.5	12.4	0.2	1.2
Girls	7.2	0.0	5.5	2.5	2.0
Imitative verbal aggression					
Boys	12.7	0.0	4.3	1.1	1.7
Girls	2.0	0.0	13.7	0.3	0.7
Mallet aggression					
Boys	28.8	6.7	15.5	18.7	13.5
Girls	18.7	0.5	17.2	0.5	13.1
Non-imitative aggression					
Boys	36.7	22.3	16.2	26.1	24.6
Girls	8.4	1.4	21.3	7.2	6.1

Adapted from Bandura et al., (1961) p.579.

As table 1 shows, the children exposed to the aggressive role-models showed much more aggression. This was most pronounced for boys exposed to aggressive role-models (e.g., the average number of physical aggressive responses for males was 25.8 compared to 7.2 for girls when the role-model was male and 12.4 compared to 5.5 when the model was female). Same-sexed role-models were more influential than opposite-sexed role-models and not just in imitating the aggressive acts but in the measures of non-imitative aggression - aggression shown by the child which was not a copy of the model's behaviour (this averaged at 36.7 acts imitated by boys, when the model was an aggressive male compared to 8.4 acts by girls; and 21.3 acts by girls when the model was an aggressive female compared to 16.2 acts by boys).

The same-sexed model was influential for boys across all measures – there were higher rates of imitation for boys in whatever the male role-model did. This trend was there for girls, but it was less pronounced and boys imitated an aggressive female more than girls imitated an aggressive female (12.4 to 5.5.). This may relate to the cumulative exposure the children had had to aggressive role-models outside the study and to the broader Western culture towards aggression as part of the masculine gender schema.

This study demonstrates that learning can occur by observing and then imitating the behaviour of a role-model. No reinforcement or punishment is present. Observing aggression lowers the inhibitions to act aggressively. The boys were influenced more by the model to act aggressively because of the wider cultural influence that such behaviour is gender appropriate. In a later study Bandura (1965) did expose children to models who they saw being rewarded for acting aggressively or being told off and punished and the children were significantly less likely to imitate behaviour associated with punishment.

This study was ground-breaking and occurred at a time when television was becoming popular and at a time when there was a growing concern among the public and the US government that television violence could increase aggression in its young viewers. To explore this, Bandura, Ross and Ross (1963) repeated the study, exposing some children to a live adult model acting aggressively or a TV recording of the same model acting aggressively or an aggressive cartoon character. Each child was then mildly frustrated and their subsequent behaviour was measured following the same format used in the first study. Greatest imitation occurred with the live model followed by the TV model and then with the animated aggression. Notably, the aggression levels were significantly higher compared to children exposed to non-aggressive models or to no models. However, in all these studies, the children's aggression was measured towards a toy, not a real person.

Hanratty, O'Neil and Sulzer (1972) adapted the bobo doll method and measured their subsequent aggression in how they acted towards a real person dressed as a clown. Those exposed to the aggressive model showed significantly more aggression towards the clown compared to children exposed to the non-aggressive models and the controls. Liebert and Baron (1972) randomly allocated children to a condition where they watched either Sports Shows or violent scenes from the movie 'The Untouchables'. Later, each child was given the opportunity to aggress towards another child – a child they didn't see or know, by pressing a button marked 'hurt'. Those exposed to the violent film pressed the button more frequently and held the button down for longer! Although, of course, if they never saw the child and if all they had to do was to carry out a non-aggressive act like pushing a button marked 'hurt', it raises issues about the validity of 'button pressing' as a proxy for aggressive behaviour. After all, it is much easier to push a button than to initiate an aggressive act.\*

### **Imitation and mirror neurons.**

Rizzolatti et al (1996) placed electrodes in the ventral premotor cortex of macaque monkeys and recorded their neuron activity when the monkeys reached out and picked up food and they recorded their neuron activity when they observed other monkeys or the researchers perform the same action. They found that during the observation phase some of this same neuron activity was recorded. They called this the mirror-neuron system. Ferrari et al (2003) observed similar mirror neuron activity in relation to the neurons involved during mouth actions and facial gestures. Approximately 30% of this neuron activity was observed when the monkeys observed the mouth actions or facial gestures of other monkeys and this was in the region of the brain that approximates to the Brocas area, or speech production centre, in humans. Our ability to empathise and a child's ability to learn empathy draws, in part, on this mirror neuron system. Keysers, Kaas and Gazzola (2010) used functional magnetic resonance imaging (fMRI) with human volunteers to explore the mirror neuron system. fMRI measures activity across the whole brain and they observed activity in different brain regions, especially the somatosensory cortex and it is this mirror response that enables the observer to connect with the actor's movements. Bandura and colleagues offer a compelling case for the impact of observational learning - that one can learn without the need for rewards and punishments, and this more recent evidence on neuroscience demonstrates the role of biology in making this type of learning effective.