

Experiment 5: Avoidance, Heart rate and Attentional Bias

Using the vicarious learning procedure developed by Askew & Field (2007) children were shown one animal (e.g., a quokka) with 10 faces expressing fear ('fear-paired'), another animal (e.g., a cuscus) with 10 faces expressing happiness ('happy-paired') and a third animal (e.g., a quoll) alone on the screen 10 times ('unpaired'). Trait Anxiety was measured using the State-Trait Anxiety Inventory for Children (STAIC) and Multidimensional Anxiety Scale for Children-10 (MASC-10). Changes in children's fear beliefs, avoidance preferences and attentional bias for animals was measured via questionnaire, a nature reserve task, a behavioural approach task and a visual search task. Longitudinal (follow-up) measures were also taken to determine how lasting elements of the fear emotion are: measures of fear beliefs, avoidance preferences and attentional bias were taken again one week and one month later.

The experiment investigated cognitions, behaviour, physiological responses and attentional bias following vicarious fear-related learning in children and had three main objectives. It sought to establish whether vicarious learning can lead to:

- a) Lasting increases in children's fear beliefs for the animals
- b) Lasting attentional bias towards the 'fear-paired' animal
- c) Increased behavioural avoidance and lasting avoidance preferences for the 'fear-paired' animal
- d) Increased physiological (heart rate) responses for 'fear-paired' animals

Procedure and measures:

Children filled in two computer-based questionnaires, watched a short film clip in which female adults responded either fearfully or neutrally when asked to place their hand in a box apparently containing a novel animal (a quokka or a cuscus). Fear-related beliefs and approach/avoidance behavior for the animals were measured using a series of measures.

1. State-Trait Anxiety Inventory for Children (STAIC)

Attentional biases are known to be related to general anxiety levels. The *State-Trait Anxiety Inventory for Children* (STAIC; Spielberger, 1973) was therefore used to measure children's trait anxiety to determine whether chronic global anxiety mediates the relationship between vicarious learning and attentional biases. The scale is comprised of 20 items and children respond on a three-point Likert-type scale.

2. Multidimensional Anxiety Scale for Children – 10 (MASC-10)

The 10-item *Multidimensional Anxiety Scale for Children – 10* (MASC-10; March et al., 1997) was also used to measure children's anxiety symptoms and trait anxiety (how the child has been "thinking, feeling, or acting recently"). Children respond on a four-point Likert-type scale ('never true about me', 'rarely true about me', 'sometimes true about me', 'often true about me').

3. Fear Beliefs Questionnaire1 (FBQ1)

Children filled in a computer-based fear beliefs questionnaire to measure fear-related beliefs for the three animals. The questionnaire contained seven questions for each animal; for example, “Would you be scared if you saw a quokka?” and “Would you be happy to have a cuscus for a pet?” Children responded on a 5-point Likert scale: 0 (*No, not at all*), 1 (*No, not really*), 2 (*Don’t know/Neither*), 3 (*Yes, probably*), and 4 (*Yes, definitely*). There were a total of 21 questions. Mean fear beliefs scores for each animal was calculated for each child.

4. Vicarious learning (VL)

Each child was shown one Australian marsupial (e.g., a quokka) with 10 faces expressing fear (‘fear-paired’), one Australian marsupial (e.g., a cuscus) with 10 happy faces (‘happy-paired’, and a third (e.g. quoll) alone on the screen 10 times (‘unpaired’). Each of the 30 trials began with a randomly chosen animal picture appearing alone on the screen for 1 s. The marsupial picture remained displayed for a further 1 s while, depending on the counterbalancing order, either a scared or happy face was simultaneously presented on the opposite side of the screen, or no face appeared and the animal remained alone. Accordingly, the total length of a single trial from start to finish was 2 s. The interval between each pairing was a random interval that varied between 2 and 4 s. The procedure was counterbalanced across children so that the quokka, quoll and cuscus were each paired with happy, scared or no faces.

5. FBQ2

Children completed the FBQ a second time to ascertain if fear-related beliefs for animals changed due to the procedures.

6. Visual Search Task (VST) (Attentional Bias measure)

A visual search task was used to measure attentional bias. Children were asked to indicate as quickly as they could whether a target stimulus (a Quokka, Cuscus or Quoll) was present within a 3 x 3 grid of distracters (leaves). Children’s reaction times (RTs) to touch the animal on the touch screen were recorded for each animal/distractor trial. The visual search task was used to ascertain whether attentional biases are created for the Australian marsupials during fear-related vicarious learning. If children take significantly less (or more) time to find fear-paired animals than control animals this would indicate vicariously learnt attentional bias.

7. Behavioral Avoidance Task and Heart Rate

Children were shown three animal boxes and told the three animals were in them. They were asked to stand on a line positioned 1m from the boxes and were given verbal instructions to approach the quokka. The stopwatch was started as soon as the instructions had been given and stopped when children had put their hand in the box. This was repeated for the other animals. Children’s heart rate was recorded at four points in time: 0 seconds (baseline), after 5 seconds, after 10 seconds and after 15 seconds. Heart rate measures were also taken at three ‘action points’: approaching the animal, putting their hand in box, and withdrawing their hand.

8. Nature Reserve Task (NRT)

Children were asked to imagine that the board was a nature reserve containing one of the animal CSs. One of the animals, depicted by a photograph, was at one end of the reserve. Children are asked to place a Lego model representing themselves on the board where they would most like to be. The distance between the animal and the Lego figure was measured and indicated children's avoidance preferences for the animals. The same procedure was then repeated for the second and third animal. The order that animals were presented in was counterbalanced across children.

9. Follow-ups

Children completed the FBQ, the Visual Search Task and the Nature Reserve Task again 1 week later (Time 2) and 1 month later (Time 3).