

Experiment 9: Vicarious counterconditioning

Procedure and measures:

Children first completed the nature reserve task and fear beliefs questionnaire to determine fear beliefs and avoidance preferences for two Australian marsupials (CSs: quokka and cuscus). Next they observed Askew and Field's (2007) vicarious learning procedure for the two animals. Fear beliefs and avoidance preferences were then measured for a second time to determine if they had increased for animals seen in vicarious fear-learning trials. Children were then randomly allocated to one of three fear reduction groups: counterconditioning, extinction or control. Children's fear beliefs and avoidance preferences were measured for a third time to investigate whether the unlearning procedures had reduced children's fear for the animals. Finally, children's behavioural avoidance, heart rate and attentional bias (via dot probe task) were measured.

1. Nature Reserve Task (NRT)

Children were first 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 animal. The order that animals were presented in was counterbalanced across children.

2. Fear Beliefs Questionnaire1 (FBQ1)

Children filled in a computer-based fear beliefs questionnaire to measure fear-related beliefs for the two 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 14 questions. Mean fear beliefs scores for each animal was calculated for each child.

3. Vicarious learning (VL)

Each child was shown one Australian marsupial (e.g., a quokka) with 10 faces expressing fear ('fear-paired'), and one Australian marsupial (e.g. quoll) alone on the screen 10 times ('unpaired'). Each of the 20 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, a scared 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 animals were each paired with scared or no faces.

4. NRT2

Children completed the NRT a second time to determine whether avoidance preferences

had increased or decreased as a result of the procedures.

5. FBQ2

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

6. Fear Reduction/Unlearning

Children were randomly assigned to one of three unlearning groups: immunisation, latent inhibition or control. Children in the counterconditioning group were presented with a second vicarious learning procedure in which the fear-paired animal (CS) was presented 10 times together with happy faces (US). The unpaired animal (CS) was not seen again here. Children in the extinction group saw their previously fear-paired animal (CS) again 10 times alone on the screen. Control group children saw no presentations of either animals or faces but watched a slideshow of 20 unrelated pictures (e.g. a guitar and a teapot).

5. NRT3

Children completed the NRT a third time to determine whether avoidance preferences had increased or decreased as a result of the procedures.

6. FBQ3

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

7. Behavioral Avoidance Task and Heart Rate

Children were shown two animal boxes and told the two animals were in them. They were asked to stand on a line positioned 1m from the boxes and were given verbal instructions to approach one of the animals. 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 animal. 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. Dot Probe Task (Attentional Bias measure)

A dot probe task was used to measure attentional bias. The two animals (Quokka and Cuscus) were briefly presented simultaneously on the computer screen, one on the left the other on the right. The pictures disappeared to reveal a dot probe (either : or ..) 'behind' one of the animal pictures. Children were asked to locate the probe and response times were recorded. A child was deemed to have an attentional bias for a particular animal if they were faster at locating a probe when it appears behind that animal because faster response times indicate increased attentional engagement toward and/or decreased engagement away from this animal. Two different pictures of each animal were used and counterbalanced for position (8 trials). The position of the two probes (: and ..) were counterbalanced with each of the pictures (32 trials). Each trial was presented twice creating a total of 64 trials. Before the actual trials children were given 16 practice trials with only the probes appearing on the screen (no pictures of the animals).