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Does 'Yuck' mean 'Eek'? Fear responses in children after a disgust manipulation

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ABSTRACT

Background and objectives: Disgust is a basic emotion that is thought to play a role in the development of animal phobias. This study was conducted to test whether experimentally induced disgust also results in higher levels of fear and interpretation bias.

Methods: Children aged 9–13 years ($N = 94$) were asked to inspect a set of specimen characteristic of a novel animal and requested to form themselves an impression of it based on those characteristics. Half of the children were given a set of disgust-eliciting products in relation to the animal, whereas the other half received a set of neutral materials.

Results: The main results indicated that children in the disgust specimen group exhibited an increase in fear towards the novel animal and a stronger inclination to interpret ambiguous situations involving this animal in a more negative way as compared to children in the neutral specimen group.

Conclusion: These findings confirm that disgust has a fear-promoting effect.

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1. Introduction

Animal fears certainly belong to the most common fears and phobias (Chapman, 1997), and are usually directed at spiders, cockroaches, wasps, snakes, mice, rats, cats, and dogs (Davey, 1994). Theories addressing the etiology of animal fears and phobias have primarily focused on harm avoidance, and imply that humans evade specific animals because they fear physical attack and injury, which may be rooted in biological preparedness (Seligman, 1971) or aversive learning (Rachman, 1991; see for a review Merckelbach, De Jong, Muris, & Van den Hout, 1996). An alternative account is concerned with disease avoidance, and centers on the notion that people stay clear of some animals as they fear to contract an illness (Davey & Marzillier, 2009). Disgust plays a crucial role in this account, as the main function of this emotion is to prevent the transmission of disease through the oral incorporation of contaminated food items (Rozin & Fallon, 1987).

Support for the idea that disgust is involved in the pathogenesis of animal phobias mainly comes from survey studies which have demonstrated positive relationships between disgust measures and scores on animal fear questionnaires (e.g., Davey, 1994; De Jong & Merckelbach, 1998; Matchett & Davey, 1991; Mulkens, De Jong, & Merckelbach, 1996; Sawchuck, Lohr, Tolin, Lee, & Kleinknecht,

2000; Woody, McLean, & Klassen, 2005), and this seems to be also true in child populations (Muris, Van der Heiden, & Rassin, 2008). Research investigating whether disgust may actually act as a causal antecedent of animal fear is relatively sparse. One exception is a study by Webb and Davey (1992) who asked non-clinical adult participants to rate fear of various types of animals before and after watching a threatening (i.e., extremely violent behavior towards another person), disgusting (i.e., repulsive scenes from a medical operation), or neutral (i.e., landscape scenes) video. Results indicated that exposure to the threatening video material produced an increase in fear ratings for predatory animals (e.g., lion, tiger, shark), exposure to disgusting the video material led to an increase in fear ratings for non-predatory fear-eliciting animals (e.g., rat, spider, snake), whereas exposure to the neutral video yielded a decrease in fear ratings for all animals. Altogether, these findings suggest that the experimental induction of disgust by means of repulsive film material produced a significant increase in the fear of small animals.

In view of the fact that animal phobias have their onset during childhood (Öst, 1987) and also represent a common type of anxiety pathology in youths (Muris, Merckelbach, Mayer, & Prins, 2000), it seems highly relevant to conduct this type of research in children. So far, experimental research on the role of disgust in childhood animal fears has focused on the verbal information pathway, which implies that fear arises when hearing or reading that a stimulus or situation might be dangerous or have another negative connotation (Muris & Field, 2010). Noteworthy is a study by Muris, Mayer, Huijding, and Konings (2008) who presented 9- to 13-year-old

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children with unknown Australian marsupials (the cuscus and the quokka), and then provided the young people with either disgust-related (e.g., “smells very badly”, “pelt full with diseases”, “eats nasty stuff such as cockroaches and maggots”) or cleanliness-related (e.g., “smells quite nice”, “pelt feels very soft”, “eats tasty fruits such as strawberries”) information about the novel animals in a counterbalanced fashion. Before and after the information, children completed scales measuring their beliefs of disgust and fear regarding both animals. It was found that the disgust-related information not only induced higher levels of disgust but also increased children's fear beliefs in relation to these animals. In contrast, cleanliness-related information decreased levels of disgust and resulted in lower levels of fear.

Although these results are clearly suggestive of a fear-enhancing effect of disgust, it can be argued that a verbal information manipulation is not the most optimal way to investigate whether disgust is involved in the development of animal fears in children. That is, it may well be the case that the disgust information about the novel animal as provided in the Muris et al. (2008) study activated a general semantic network, which also made other negative feelings regarding this stimulus more accessible (Bower, 1981).

Some support for this idea was obtained in follow-up research by Muris et al. (2009) who not only demonstrated that disgust information enhanced fear of an unknown animal, but also showed that threat information produced higher levels of disgust.

To avoid this unintended effect of verbal information and to further investigate the putative role of disgust in the etiology of animal fear, a new experiment was conducted in which children were asked to inspect a set of specimen characteristic of a novel animal and requested to form themselves an impression of it based on those characteristics. Half of the children were given a set of disgust-eliciting products in relation to the animal, whereas the other half received a set of neutral materials. Before and after this experimental manipulation, children's feelings of fear and disgust towards the animal were measured. It was hypothesized that children in the disgust condition would not only display stronger feelings of disgust ('Yuck'), but also exhibit higher fear levels in relation to the animal ('Eek') as compared to children in the neutral condition. At post-test we also administered an interpretation bias task as a more cognitive outcome measure. Interpretation bias refers to an inclination to interpret ambiguous stimuli and situations in a negative way (Harvey, Watkins, Mansell, & Shafran, 2004), and we expected that children who were exposed to the disgust-eliciting specimen would exhibit this tendency more clearly than children who were confronted with the neutral specimen.

2. Method

2.1. Participants

Children were recruited from three primary schools in Zeeland, The Netherlands. One-hundred-and-twenty-five children and parents were invited to participate by sending them a letter with information about the study, along with a consent form. Ninety-five children and parents responded positively to this invitation, which means that the response rate was 76.0%. One child could not participate because he was ill at the day that the assessment took place. Thus, the final sample consisted of 94 children (37 boys and 57 girls) who had a mean age of 10.88 years ($SD = 0.85$, range 9–13 years). The vast majority of the children and parents (i.e., 92.6%) were from original Dutch descent. Other children had an English ($n = 3$), Chinese ($n = 2$), Turkish/Swedish ($n = 1$), or Bosnian ($n = 1$) background. The research project was officially approved by the Ethical Committee of Psychological Research of Erasmus University Rotterdam.

2.2. Materials

A drawn picture of a Cuscus (10 × 10 cm) printed on an A4-paper with the text “This is a Cuscus” was used to show children what a Cuscus looks like. None of the children had ever heard of this Australian marsupial prior to this experiment.

Seven glass jars with alleged specimen of the Cuscus were used to give children an impression of the properties of this unknown animal. The specimen in the jars formed the experimental manipulation in this study, and thus were different for the disgust and neutral conditions. Table 1 lists the specimen categories as well as a description of the specific products that were employed in each condition. As can be seen, in the disgust condition, products were meant to elicit feelings of revulsion regarding the Cuscus. In contrast, in the neutral condition more neutral products were chosen to avoid that children would link the Cuscus together with disgust.

2.3. Assessment

2.3.1. Fear and disgust scales

Two separate 5-item scales were employed to measure children's feelings of fear and disgust towards the Cuscus. The items of the fear scale were “Do you think that your hand will be bitten when you touch a Cuscus?”, “Would you quickly run away because you think that the Cuscus is dangerous?”, “Would you feel scared of being attacked if you put your hand in the hutch of a Cuscus?”, “Would you feel scared of the Cuscus, because you think he will do scary things”, and “Would you be scared and quickly go inside, if you encounter a Cuscus near the house?”. The items of the disgust scale were “Would you feel dirty if you had to clean the hutch of a Cuscus?”, “Would you enjoy eating your sandwich if you were close to a Cuscus?” (reversed item), “Would you carefully wash your hands if you had touched a Cuscus?”, “Would you hold your nose, if you were close to a cuscus?”, and “Would you feel sick of a Cuscus, because you think of all his disgusting habits?”. Children were asked to answer the items of both scales on five-point rating scales with 1 = No, not at all, 2 = No, not really, 3 = Yes, a little, 4 = Yes, I think so, 5 = Yes, absolutely. Total fear and disgust scores (range 5–25) were calculated by summing the ratings across items (Cronbach's α s being respectively 0.75 and 0.64 at pre-test, and 0.86 and 0.87 at post-test), with higher scores being indicative of stronger feelings of fear and disgust.

2.3.2. Fear survey schedule for children-revised (FSSC-R; Ollendick, 1983)

A shortened version of the FSSC-R (Muris et al., 2003) was employed to assess children's general levels of fearfulness. This questionnaire consists of 25 items that measure the intensity of children's fears of danger and death (e.g., “Being hit by a car or

Table 1

Description of the presented specimen referring to the properties of the novel animal (Cuscus) in both experimental conditions.

Specimen category	Disgust specimen	Neutral specimen
Food	Brown gunge	Fruit
Sleeping place	Nest of mud and slush	Nest of leaves, petals, and flowers
Drink	Turbid water with dead flies	Clear water
Fur	Piece of dirty, entangled fur	Piece of clean, well-combed fur
Territory	Excrements	Shells and stones
Smell	Tissue sprinkled with stinking and sourish fluid	Tissue sprinkled with flower-like perfume
Living space	Spiders and insects	Ladybirds

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