



Larvae phobia relevant to anxiety and disgust reflected to the enhancement of learning interest and self-confidence



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ABSTRACT

Psychologists have claimed that aversive reactions to animals and insects evolved because of disease avoidance and may be nothing more than a post hoc rationalization. However, such aversive reactions may affect students' learning interest and self-confidence in the study of larvae or caterpillars. To realize this affect, the present study surveyed 322 fourth grade students and 277 valid surveys were returned. Using confirmatory factor analysis with structural equation modeling, the results indicated that if students had higher levels of larvae aversion, they experienced higher the levels of disgust and anxiety when attending science classes that focused on the study of larvae; the higher the level of anxiety and disgust experienced by students the lower their level of learning interest. Further, the higher the level of interest regarding learning about larvae, the higher the students' self-confidence enhancement. These results implied that science teachers may need to reduce students' aversions before commencing a science course about larvae in order to promote students' learning interest and self-confidence.

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1. Introduction

Human beings generally view and treat other creatures from their own perspective rather than consider themselves as a part of the biosphere. When faced with insects, larvae or caterpillars, some humans may feel scared, disgusted, want to distance themselves due to fear, or even eliminate the creature to relieve themselves. Thus, whether larvae (or caterpillar) phobia will affect students' behaviors and learning interest in a larvae-related science course is worth exploring. Anxiety researchers have examined a wide variety of emotional processes (e.g., McNally, 2002) and devoted studies to disgust and nausea experienced in respect of spider related phobias (Woody, McLean, & Klassen, 2005). There have also been a number of investigations that have applied cognitive theory to specific phobias and anxiety. Such cognitive concepts may include patterns of anxious self-statements (Cacioppo, Glass, & Merluzzi, 1979; Huber & Altmaier, 1983), and anxious cognitive schemas (Beck & Emery, 1985). Despite the large number of cognitive concepts and mechanisms found to be related to anxiety and fear, causality between these mechanisms and anxiety disorders remains to be established. Moreover, there have been few attempts to examine aversion to larvae and affective learning factors. Accordingly, this study incorporated larvae phobia, anxiety of attending a science class that focused

on larvae, and disgust or disgusting feelings experienced in that class, to explore the correlates between these factors and students' learning interest and self-confidence in learning.

2. Theoretical background

Phobias are common and often the fear is out of proportion to the actual threat that the phobic events and objects present (Davey, 2007). Phobias are normally defined as an unreasonable fear of a particular situation or object, and they are extraordinarily common, with research suggesting that 60.2% of the general population (Ollendick, King, & Muris, 2002) experience unreasonable fears (Davey, 2007).

Based on cognitive theories of anxiety, previous research has proposed that anxiety interferes with elaborative processing of threat-related information (Foa & Kozak, 1986). Fear is a powerful human emotion, and while most people experience fears occasionally, there are some individuals to whom fear and anxiety constitutes a debilitating correlation (Armfield, 2006). Recently, there has been growing interest in the study of disgust and fear in anxiety disorders (Botella, Bretón-López, Quero, Baños, & García-Palacios, 2010; Cisler, Olatunji, & Lohr, 2009). It is also well documented that disgust or nauseating responses with respect to insects can be effectively lowered by professional exposure-based treatments (Hirai, Vernon, & Cochran, 2006). In light of findings that have suggested the potential role of nausea or feelings of disgust in such naturalistic processes (Vernon & Berenbaum, 2004), this study looked at a science class that focused on larvae (or

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caterpillars) to examine whether students' larvae phobia could predict learning interest.

Interest is the outcome of an interaction between a person and a particular content (Schiefele, 2001). The potential for interest is within an individual but the content and the environment define the direction of interest and contribute to its development (Hidi & Renninger, 2006). Based on neuroscientific research (e.g. Davidson, 2000, Panksepp, 2003) on approach circuits in the brain, interest has been found to be a biological foundation of the psychological state in the sense that the person is engaged physically, cognitively, or symbolically with the object.

Interest as a motivational variable refers to the psychological state of engaging or the predisposition to reengage with particular classes of objects, events, or ideas over time (Hidi & Renninger, 2006). Renninger and Hidi (2011) suggested that by motivating exploration, interest can lead the individual to have new experiences, which in turn, can lead to greater knowledge about the object of exploration in a topic or domain. Further, interest serves as a source of task value (Wigfield & Eccles, 2000), and although considered a positive emotion, when a negative experience occurs, the individual may attempt to figure out strategies to overcome the disturbance. Ainley, Hidi, and Berndorff (2002) highlighted that topic interest can increase levels of positive affect, which increased persistence, and subsequently increased learning from texts. Based on the evaluation of learning interest, students may continue to be motivated to work towards the goal, or cease to be motivated. The emphasis in most learning motivation has been labeled as extrinsic motivation to engage in an activity that contributes to this goal-striving process to reach learning goals (Wigfield & Eccles, 2000). In line with this, learning interest may enhance students' continuance intentions to learn about larvae and the correlates can be explored.

Self-confidence is defined as the beliefs the learner holds about his or her own ability. It is also the degree of certainty about a perception, event, or outcome. Practically, self-confidence can be seen as a self-belief variable and a self-awareness of capability (Köszegi, 2006; Weinberg, 2009). Self-belief was shown to be an important factor in relation to anxiety of learning tasks (Wilson, Sullivan, Myers, & Feltz, 2004). This suggests that under conditions of high physiological arousal, elevated anxiety will debilitate learning performance, whereas low arousal of anxiety can be beneficial to self-confidence in learning performance (Kunda, 1990). Self-confidence is pertinent to learning behavior and learning outcomes, and other key factors within the learning environment (Stankov & Lee, 2008). In line with this, a science class that focused on the study of larvae was selected as the learning environment in this study.

3. Research hypothesis and model

Previous research has examined automatic attentional biases towards threat related stimuli in anxiety (e.g., Foa, Feske, Murdock, Kozak, & McCarthy, 1991; Tolin, Lohr, Lee, & Sawchuk, 1999; Watts & Dalgleish, 1991). Under conditioning terms, this can be described as a bias towards expecting an aversive unconditioned stimulus (UCS) following a phobic conditioned stimulus (PCS) (Davey, Cavanagh, & Lamb, 2003). Fear relevant (FR) stimuli have been found to be correlated to feelings of disgust in general population samples (e.g., Davey et al., 2003). In studies of PCS judgments, the expectancy biases are exaggerated in individuals with prior fear of the stimulus (e.g., Diamond, Matchett, & Davey, 1995; Cavanagh & Davey, 2000). That is, non-selected participants reported a greater expectancy of an aversive UCS following presentations of FR stimuli (Davey & Dixon, 1996; Honeybourne, Matchett, & Davey, 1993). In line with this reasoning, the research hypotheses and model (see Fig. 1) are proposed as follows:

H1. Larvae phobia is positively correlated to anxiety of attending science class that focuses on larvae.

H2. Larvae phobia is positively correlated to feeling disgusted in science class that focuses on larvae.

H3. Anxiety of attending science class that focuses on larvae is negatively correlated to interest in learning about larvae.

H4. Feeling disgusted in science class that focuses on larvae is negatively correlated to interest in learning about larvae.

H5. Interest in learning about larvae is positively correlated to self-confidence of learning about larvae.

4. Method

4.1. The teaching settings

Teaching materials can be used to potentially regulate students' learning interest and students must be able to be effectively exposed to the available materials. Considerable evidence attests to the beneficial effects of such exposure, but there are diverse exposure procedures and there are divergent explanations of exposure outcomes (McGlynn, Rose, & Jacobson, 1995). Textbooks contain information, illustrations, or other details that can hold students' attention, and are considered important or related to the concepts to be learned. Thus, this study surveyed students who used textbooks in the science classroom to learn concepts about larvae and explored their learning interest and intention to attend the class.

A creature's taxonomy, biological characteristics and structure, ecology, behavior, life cycle, reproductive behavior, defense mechanism, and trophic behavior can vary. The appearance of the larvae and adult moths or butterflies is considerably different and students can learn about the life cycle through the images in a textbook. Their life cycle includes the following stages: egg, hatching, 1st-instar larva, molting, 2nd-instar larva, molting, 3rd-instar larva, molting, 4th-instar larva, molting, 5th-instar larva, pupation, eclosion, reproduction, oviposition, and death.

4.2. Procedure

The "larvae phobia and larvae aversion scale" was designed based on various research structures and was revised according to the suggestions of two scholars and two teachers to construct the content validity.

The measurement of larvae phobia was conducted one week before a science class that focused of larvae; measurement regarding anxiety of attending class was conducted before the class; the measurement of feeling disgusted in class was conducted after the class; and the measurements of learning interest and self-confidence in learning about larvae was measured one week after the class.

4.3. Participants

The sample for this study consisted of fourth grade elementary school students from the Taipei region. A questionnaire was used to collect information, using the "larvae phobia and larvae aversion scale". Based on the 322 participants in this study, 102 students were from urban schools, 134 students were from suburban schools and 86 students were from rural schools. Of the 322 distributed questionnaires, 207 valid questionnaires were returned (64.3%) and 17 incomplete questionnaires were omitted from the analysis. The sample consisted of 110 females (57.9%) and 80 males (42.1%).

4.4. Measuring questionnaire

All of the constructs were measured using multiple items, and were shown on a Likert 5 points scale ranging from "strongly disagree" to "strongly agree".

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