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Origins of Common Fears: A Review

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Whether you cower while looking down from great heights or fear looking up to the stormy skies, whether you fear the bite of a fat venomous snake or fear the bite-sized fattening snacks, your fears must have had an origin, they must have come from somewhere. But where? Join me as I lead a tour of our collective psyches to discover the origins of our common fears in the major psychological theories of the last century.

It is said that the mere sight of the mythological creature Medusa, a mortal Gorgon with a nest of venomous snakes for hair, could turn onlookers to stone. In real life, there are no such universal sources of petrification. But some common sources of fear include injections, injuries, death, aliens, heights, and snakes—the latter two being among human beings' most prevalent fears (e.g. Agras, Sylvester, & Oliveau, 1969; Fiset, Milgrom, Weinstein, & melnick,1989; Lapouse, & Monk, 1959; Moore, Brødsgaard, & Birn, 1991; Oosterink, De Jongh, & Hoogstraten, 2009). Have you ever wondered why these fears are common? For instance, why are many of us afraid of snakes? Is it because we have been *warned* that snakes are dangerous? Or because they *appear* dangerous? Or maybe because they have actually *harmed* many of us? These are the kinds of questions I address in this review as I examine major psychological theories (i.e. behavioral/learning, evolutionary, cognitive, and personality), seeking to understand the genesis of common fears. As I examine these approaches, for the sake of unity I use mainly the example of fear of snakes. However, I encourage you to also think of what frightens you personally, so that as you read about different approaches, you are able to evaluate whether they can elucidate the genesis of your own fears. With that in mind, it is time to start our

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article glossary

Classical conditioning
Stimulus
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Unconditioned response
conditioned stimulus
conditioned response
informational learning

journey. We begin with examining three learning theories. First stop: *Classical conditioning*.

Why Are We Afraid?

Classical conditioning

To explain how this theory works, I first need to define a few terms. A *stimulus* is a sensory object or event (e.g., scent of food) that evokes a *response*—some kind of change in the organism (e.g., salivation). In some cases, the relationship between a *stimulus* and a response is reflexive/unlearned (*unconditioned*). For instance, a bite (*the unconditioned stimulus*) evokes fear and pain (*the unconditioned response)* reflexively. In other cases, the association is learned or *conditioned*. One way this learning occurs, is through c*lassical conditioning*. In *classical conditioning*, we learn to associate a new *stimulus* with an unconditioned one, usually through repeated pairings of the two.

recall
observational learning
power
perception
trait
prejudice
schema
empirical research
phobia
Behavior therapy
cognitive dissonance
dehumanization
relation
meta-analysis

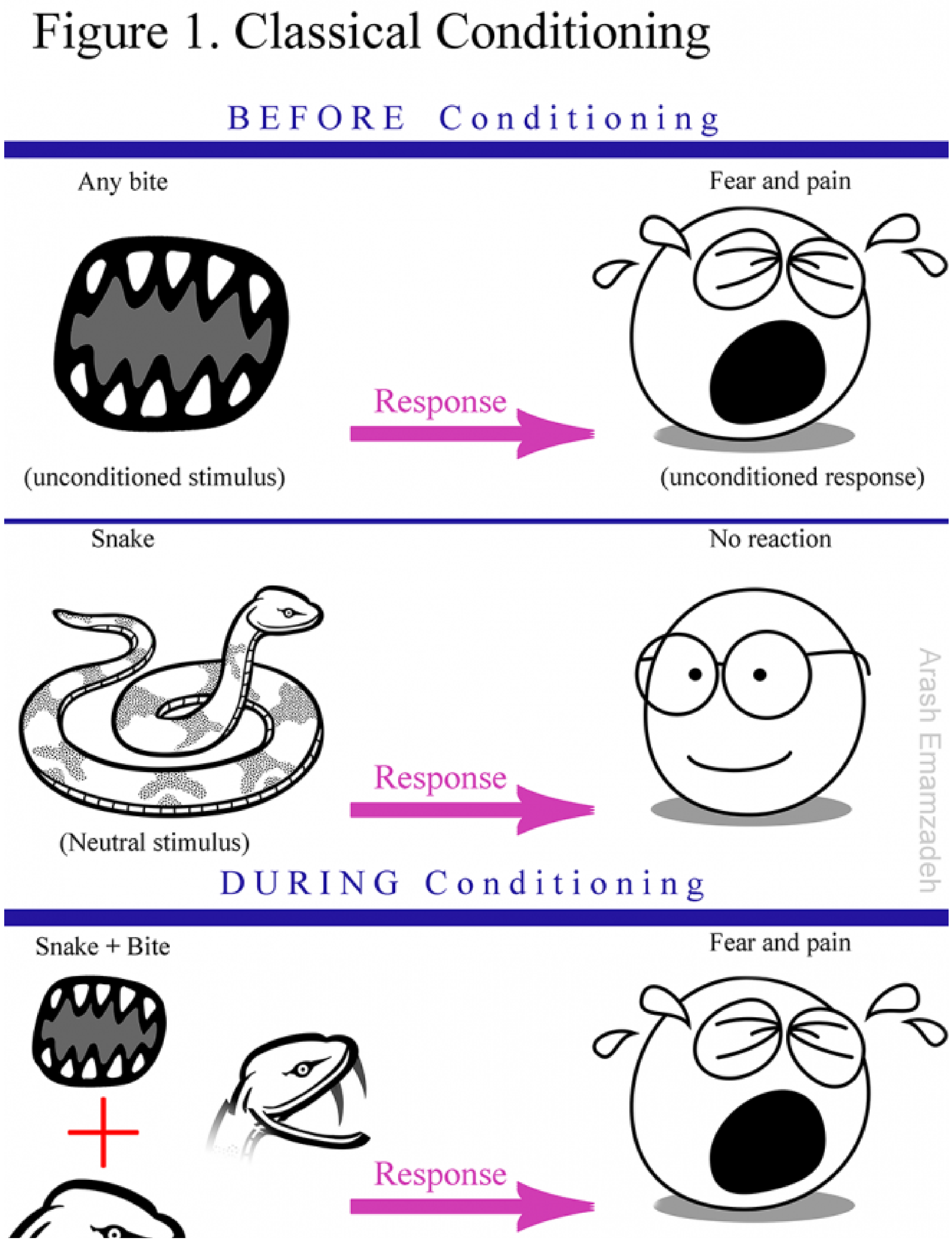
Figure 1. Classical Conditioning
BEFORE Conditioning
Any bite
Fear and pain
Response
(unconditioned stimulus)
(unconditioned response)
Snake
No reaction
Response
(Neutral stimulus)
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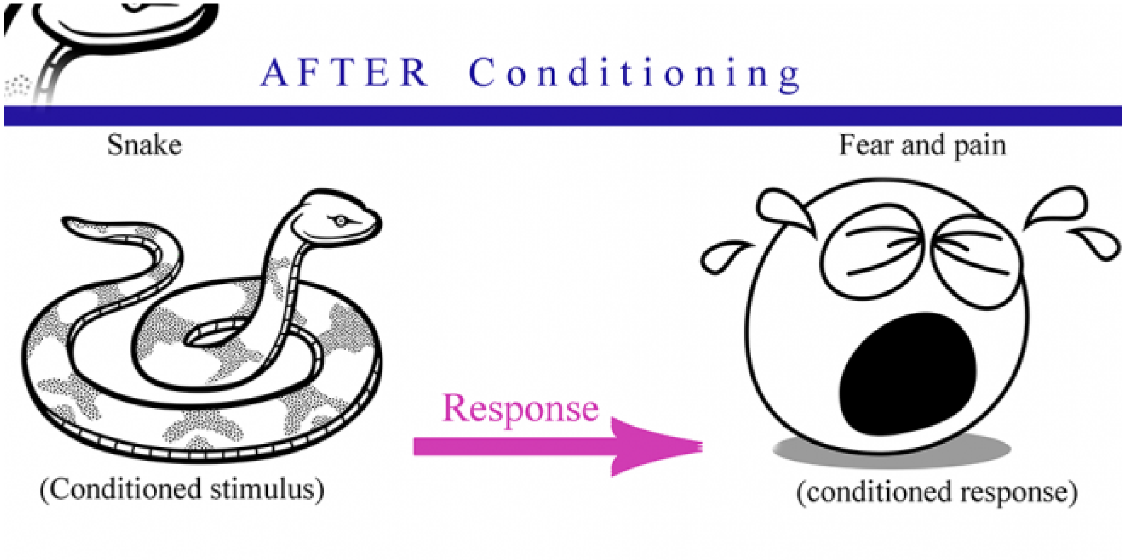
DURING Conditioning
Snake + Bite
Fear and pain
Response



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Let me use an example: Chase, who is not initially afraid of snakes, receives a painful bite from one, and subsequently, becomes afraid of them. What has happened, according to *classical conditioning*, is that the biting incident has taught Chase to associate the *unconditioned stimulus* (bite) with the once-neutral *stimulus* (snake). That is, the snake has become the learned or *conditioned stimulus*. As a *conditioned stimulus*, the sight of snake now evokes the same response of fear and pain (i.e. *conditioned response*) in Chase, that a bite does. See Figure 1. Now that we are (hopefully) clear on what *classical conditioning* is, we can review research on the role of conditioning in etiology of fears.

In an exploration of 10 common fears, conditioning events were reported by as few as 6% (afraid of bombing attacks) to as many as 70% (afraid of suffocation) of the 1092 participating schoolchildren (Ollendick & King, 1991). In a study of fears in 129 children, the percentages of those who attributed the onset of their anxieties to conditioning ranged from 25% (for fear of "the unknown") to 50% (for fear of "failure and criticism"); overall, conditioning was "the most frequent pathway for fear of animals, medical fears, and fear of failure and criticism" (Muris, Merckelbach, & Collaris, 1997, p. 933). In an investigation of fear of dogs in 100 undergraduates and 30 schoolchildren, conditioning events were reported by 50% of participants (Doogan & Thomas, 1992). In research by Kleinknecht (1994), over 50% of 128 university students who were afraid of injections, considered conditioning the main pathway of fear acquisition. On the other hand, in a study of 50 height-fearful people, only 18% attributed their fears to conditioning (Menzies & Clarke, 1993).

And just three of 117 undergraduate participants, in Murray and Foote's 1979 research on fear of snakes, had been actually bitten by snakes.

Informational learning

Direct contact with the source of danger is not always necessary for learning. According to our second learning theory, transmission of threat-related information might also result in fear acquisition (Lebowitz, Leckman, Silverman, & Feldman, 2016). Examples of this mode of learning include parents warning children about strangers, teachers cautioning students about drugs, and doctors warning patients about overeating. As the following brief review of research shows, this mode of learning is quite common.

For instance, in Ollendick and King's 1991 study, between 76% (for fear of suffocation) and 96% (for fear of fires) of children attributed the onset of their anxieties to *informational learning*. In research by Muris et al. (1997), a range of between 0% (for fear of failure and criticism) and 41% (for fear of danger and death) of children reported the influence of information transmission. In Murray and Foote's 1979 investigation of fear of snakes, the high fear group (compared with low fear group) noted a greater influence of this pathway.

On the other hand, Menzies and Clarke (1993) reported that less than 10% of their height-fearful participants ever mentioned *informational learning*. And in Kleinknecht's 1994 research on injections and injuries, just 3% believed *informational learning* to have been the primary method of fear acquisition. Lastly, Doogan and Thomas (1992) did not find any differences between their high and low dog-fearful groups, in their *recall* of parental warnings. Thus it appears that despite its ubiquity, *informational learning* can not elucidate the etiology of some fears. But there is one last mode of learning to consider, one that is less hands-on than *classical conditioning* but not quite as "distant" as *informational learning*.

Observational learning

In observational/vicarious learning (or modeling), new behaviors are learned through direct observation of others (Gazzaniga, Heatherton, & Halpern, 2016, p. 224). *Observational learning* has been demonstrated experimentally in both infants and adults (Gerull & Rapee, 2002; Hygge & Öhman, 1978). Some of the most convincing evidence for this mode of learning comes from research on monkeys. In a series of studies, lab-reared rhesus monkeys learned to fear snakes merely by observing videos of monkeys in the wild reacting anxiously to snakes; lab monkeys' fears were not diminished even at the three-month follow-up (Mineka, Davidson, Cook, & Keir, 1984).

A number of studies have also evaluated the role of modeling in acquisition of fears in humans. Ollendick and King (1991), for instance, have reported that between 42% (for fear of bombings) and 69% (for fear of burglar break-ins) of the participants in their high-fearful group, considered vicarious learning influential. In their investigation of fear of snakes, Murray and Foote (1979, p. 491) found modeling more instrumental than *classical conditioning*, though the evidence for its causal role was "marginal." About 20% of the participants in Menzies and Clarke's fear of heights study considered *observational learning* causal (1993). In Kleinknecht's 1994 research on fear of injections and injuries, 16% pointed to modeling as the main pathway of fear acquisition. However, in their research on fears in children, Muris et al. (1997, p. 933) concluded that vicarious learning was barely influential—significant only in the "fear of the unknown" category (4%). Doogan and Thomas (1992, p. 390) similarly observed "no significant differences" for the effect of modeling in their low and high dog-fearful groups.

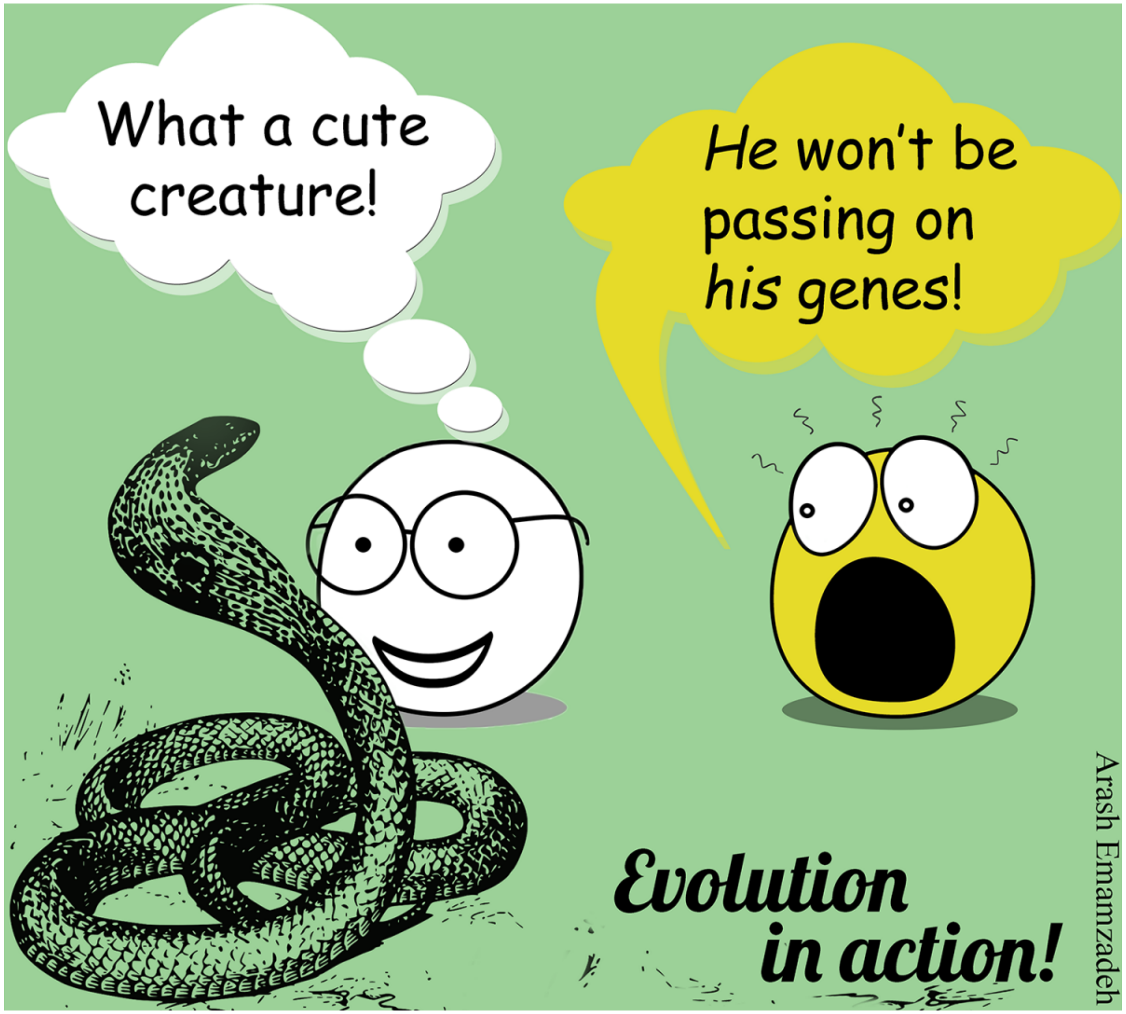
In light of these findings, modeling appears to have limited explanatory *power* as a causal pathway. Indeed, learning approaches as a whole might not be able to explain certain puzzling findings. For instance, in the study of the monkeys noted earlier, the lab-reared monkeys had also been shown videos edited in a way to show wild monkeys reacting fearfully not to snakes but to flowers and toy rabbits; but no fear learning had resulted (Cook & Mineka, 1990).

Evolutionary psychology

Evolutionary psychology might be able to provide an answer to our puzzle. Evolutionary psychology investigates the ultimate causes of behavior through the application of *evolutionary theory* (Shackelford & Liddle, 2014). As you may know, evolutionary theory describes changes in inherited traits of populations across generations. Since there is competition for (limited) resources in every generation, the organisms that happen to be better adapted to survive and reproduce under the local circumstances, are more likely to pass on their genes to future generations. What evolutionary psychology claims is that some of our current behaviors are evolutionary *adaptations*, meaning that they have been inherited solely because millions of years ago they solved specific and recurrent problems related to survival/reproduction of our species (Buss, 1995). Is fear of snakes one such adaptation?

Isbell, an anthropologist, believes so; she has presented evidence that our complex visual system was in part shaped by the presence of venomous snakes that preyed on our primate ancestors (2006, 2009). Sixty million years ago, a family of snakes evolved an "extraordinarily potent venom delivery system," and as a result, apes and Old World monkeys—who co-existed with these venomous snakes—evolved both a greater fear of the snakes and a more advanced visual system to detect them (Isbell, 2006, p. 4). But primates like lemurs, which never co-existed with venomous snakes, did not evolve an advanced visual system, nor learned to fear snakes (Isbell, 2006). Isbell (2009) concludes that "our excellent vision is mainly the result of evolutionary pressure to detect and avoid snakes"; if "snakes had stopped being a problem for our primate ancestors," she says, "we probably would not have…[fear of snakes] today" (pp. 147-148).

Psychologists Menzies and Clarke (1995), building on the evolutionary approach, have proposed that we are *born afraid* of certain stimuli, stimuli that were relevant to the survival of our ancestors in the dangerous environment of millions of years ago (e.g., strangers, spiders, snakes, heights, etc). In their exploration of fear of heights, for instance, these researchers observed that while 46% of the participants attributed the origins of their fears to learning, 30% claimed that their fear of heights had "always been this way" (Menzies & Clarke 1993, p. 358). Other psychologists, however, believe that evolution has produced an "adaptive biological preparedness," a readiness which can result in quick and easy fear acquisition but *only* when learning opportunities exist (Seligman, 1971; McNally, 2016, p. 586). The preparedness theory might be able to help us explain the puzzling result of the monkey studies (Cook & Mineka, 1990). We simply need to remember that these monkeys are the descendants of monkeys who, millions of years ago, were quick to detect and learn to fear snakes (one of their main predators), thus allowing them to survive and reproduce **(**Mineka, & Zinbarg, 2006). Learning to fear flowers or rabbits, on the other hand, had no survival advantage.



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Cognitive and personality theories

Here is one more puzzle. How might evolutionary-based approaches help us understand our *lack of* fear of mushrooms? Why should we fear mushrooms, you ask? Because poisonous mushrooms have posed a survival threat perhaps even greater than those of spiders and snakes (Delprato, 1980). Could it be that spiders and snakes, but not mushrooms, *appear* more dangerous? If so, we may need to explore the role of *cognitions*—mental processes associated with the *expectations* or *perceptions* of danger (e.g., Davey, 1995)—in the genesis of fears.

For instance, it has been suggested that our fear response is evoked not by an animal as a whole, but only by its salient qualities (e.g. its speed)—or, in the case of snake, its unusual appearance or the suddenness of its movements (Bennett-Levy & Marteau, 1984; Merckelbach, van den Hout, & van der Molen, 1987). The implication is that if we were to come across a new *stimulus* (e.g., an animal we have never seen before), our fear response might depend on our *perception* of, say, the animal's speed, the suddenness of its movements, the strangeness of its appearance, or some other fear-relevant salient features.

What other features? Disgustingness, for one. Perceptions of disgustingness are influenced by *personality traits*—dispositions to think, feel, and behave in particular and stable patterns across situations. Specifically, there are individual differences in the *trait disgust proneness*, or "the extent to which disgust is experienced" (Olatunji, Armstrong, & Elwood, 2017, p. 613). What this means is that some people are more likely to experience disgust, when exposed to disgust-related fear stimuli (like saliva or feces), and more likely to fear contact with such stimuli.

Disgust-relevant stimuli are often those that are able to carry disease (e.g., blood, saliva, sexual secretions). Indeed, disgust may be an evolutionary adaptation for disease avoidance (Oaten, Stevenson, & Case, 2009). Davey (2011) notes that the reason some other stimuli (like worms, slugs, or snakes) are considered disgusting is perhaps because they *resemble* the major disgust-inducing stimuli (e.g., feces, mucus). Nevertheless, disgust has been implicated in the genesis of a large number of fears and *phobias* (i.e. intense fears): Blood, injection, and injuries phobias; animal phobias (e.g. snakes, spiders); even fear-based *prejudice* toward foreigners, immigrants, and homosexuals (Hodson, & Costello, 2007; Klieger and Siejak, 1997; Mulkens, de Jong, & Merckelbach, 1996; Terrizzi, Shook, & Ventis, 2010).

Integrative theories

Having considered the main theories of origins of fears, we can now briefly consider the workings of an approach that combines and integrates various elements from these theories. Armfield (2006) presents one such model, one that is centered on *schemas*—cognitive structures that organize one's thoughts and perceptions: In this model, when a fear *stimulus* enters the system, it evokes an immediate (reflexive) fear response as soon as it triggers the relevant *schema* (Armfield, 2006). What is contained inside the *schema*? Information based on perceived "dangerousness," "disgustingness," "uncontrollability," and "unpredictability" of a *stimulus*; information that is shaped by prior learning, and personality factors like disgust sensitivity (Armfield, 2006, p. 758). Because of the complexity of the model and limited *empirical research* (e.g., Armfield, 2010; Crego, Carrillo-Díaz, Armfield, & Romero, 2013), it is too early to tell if it can successfully describe the etiology of all common fears.

Conclusion

Looking back, have any of the theories discussed shed light on the genesis of your own fears? Several of these theories have? None of them? Based on the findings reviewed in this paper, however, I propose that no single theory can describe the origins of all the common fears examined, though some approaches appear better suited to describing the genesis of particular fears or the presence of fears in certain individuals.

Namely, the genesis of fear of injections (Kleinknecht, 1994) and childhood fears of suffocation, might be better elucidated by *classical conditioning* (Muris, Merckelback, Mayer, & Prins, 2000; Ollendick & King, 1991). Children's fears of "abstract" dangers, of objects/situations with which they have limited or no firsthand experience (e.g., bombings, death), may be better elucidated using observational and perhaps *informational learning* theories (Davey, 1992; Muris et al.,1997; Ollendick & King, 1991).

The origins of fear of heights or snakes may be explained using evolutionary views, in particular, preparedness theory (Menzies & Clarke, 1995; Seligman, 1971). Cognitive and personality theories, on the other hand, in addition to complementing other approaches, are more suited to describing the genesis of fears related to novel stimuli, ones that may appear unpredictable and uncontrollable, unusual, or disgusting. Accordingly, these theories may explain our fears of a strange-looking alien, a slimy insect, or a robot that acts in sudden and unpredictable ways.

Limitations

Some of the studies used in this review were small, and many relied on self-reports—which are not always reliable (e.g., Schwarz, 1999). In addition, the research questions addressed and the measures used varied across investigations, making direct comparisons difficult. Lastly, a number of factors (e.g., location), which were not considered, could have influenced the results of the studies reviewed. For example, while direct conditioning is an inadequate explanation for the origin of fear of snakes in the US, it may not be as poor of an explanation in research conducted in India. Why? Because less than 10 people die from snakebites each year in US; in India, over 10,000 do (Kasturiratne et al., 2008; Langley, 2005).

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