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# **A COGNITIVE THEORY OF THE ETIOLOGY OF FEAR**

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BA (Psync.&Pol) (Hons)

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# Abstract

In an effort to address weaknesses in previous theories and to provide a stronger more inclusive theoretical account of the etiology of specific phobias and sub-clinical fears, a new cognitive model is proposed. It is argued that the development and expression of fear is cognitively determined, stemming directly from perceptions of any given stimulus or situation. In particular, perceptions of uncontrollability, unpredictability, dangerousness and disgustingness are proposed to form a vulnerability-related schema, which guides future perceptions and serves to channel emotional, behavioural, cognitive and physiological reactions upon encountering a fear-relevant stimulus or situation. The cognitive schema is based on both previous learning experiences and underlying personality traits which may predispose an individual to more readily perceive any given stimulus as uncontrollable, unpredictable, dangerous and disgusting, and to react with greater arousal given these perceptions. Other cognitive resources such as coping strategies may help to mitigate the fear response by impacting upon the general cognitive evaluation arising out of the fear-provoking encounter.

The new model, termed the Cognitive Vulnerability Model, explains some of the more vexing aspects of specific phobias: (1) why some people do not acquire fears after traumatic experiences; (2) why some people with fears and phobias have never had a traumatic experience with their fear-relevant stimulus; (3) the uneven distribution of fears in the population; and (4) the apparent various modes of acquisition of fear. The model has implications for both understanding the origins of fear and for the treatment of fears and specific phobias.

Ten studies are presented which investigate the Cognitive Vulnerability Model as it relates to fears and phobias. Each study takes the form of either a published scientific paper or a paper submitted for publication. The setting out of the studies forms two parts – the first deals with the model generally and uses primarily animal fears as the feared stimulus, whereas the second part focuses on dental fear as a special case. The first paper presents a literature review of the area and the theoretical development of the model. Subsequent papers explore the relationship between fear of eight different animals and perceptions of the animals as uncontrollable, unpredictable, dangerous and disgusting,

experimental manipulations of perceptions of spiders and self-rated fear of an encounter with a spider, the extent to which vulnerability-related perceptions mediate the associations between personality trait-like dispositions and spider fear, and the recall and recognition bias for spider schema relevant words which suggests the active presence of a cognitive schema. The second part of the thesis moves to an examination of dental fear, including both those characteristics of dental fear which make it such an important social and health concern (such as the high population prevalence, the so-called 'vicious cycle' of dental fear, and the association of dental fear with numerous other fears) as well as the relationship between cognitive vulnerability perceptions and dental fear.

Although there remain limitations to overcome and more studies are required to further test the model, the studies as a whole paint a consistent picture, providing strong support for the utility of the Cognitive Vulnerability Model in explaining specific fears. The model has important implications both for understanding the genesis of fear and for treating it.

# Thesis declaration

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university. To the best of the candidate's knowledge and belief, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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# Thesis organisation

This thesis presents a newly developed theory of the etiology of specific fears and phobias. It is organised into four parts and 14 chapters, which include 10 international and national publications (eight published or accepted and two submitted for publication). Part One contains the first three chapters that look more closely at the research area and provide the general thrust of the thesis. Part Two contains six chapters (4–9) that predominantly comprise the first six studies. Chapter 4 presents a paper that summarises much of Part One of this thesis, presenting the model of the etiology of fear to the scientific audience. Chapters 5–9 comprise questionnaire and experimental studies, most using animals as the fear-relevant stimulus, which serve to support the general theory as put forward in Chapter 4. Part Three of this thesis, containing four chapters with each comprising a further study, moves the focus of enquiry from fear of animals to fear of the dentist. Chapters 10 and 11 delve into some of the characteristics of dental fear that make it quantitatively different from many other fears while Chapters 12 and 13 go on to examine the applicability of the new theory of the etiology of fear to dental fear in particular. Finally, Chapter 14 provides a synopsis of the findings presented in this thesis as well as possible future directions for research.

Due to the publication nature of this thesis, some unavoidable replication exists across chapters (publications) to some degree. In addition, the first three chapters of this thesis have been condensed yet repeated to a large extent and presented in Paper 1 (Chapter 4). Readers should also be aware that papers are presented with the same formatting as used for submission to each journal. Final copies of articles as presented in journals are not provided primarily due to copyright reasons, with publishers owning the rights to their production input into papers. However, where available, copies of the first page of the publications, as they have appeared in print, are presented in Appendix A of this thesis.

As a result of using the formatting style as per manuscript submission, differences in formatting may be evident from one paper to the next, and between specific papers and the formatting used for the remaining body of this thesis. Reference formatting, both in text and in the Reference sections of the papers, also may differ from one paper to the next.



References relating to a published or submitted journal article remain at the end of each paper, within the relevant chapter. In contrast, all references which are not contained within the submitted and published papers, including the thesis Introduction and Conclusion, Prologue, Introductions to the papers and Linkage sections, are provided in Part Four at the rear of this thesis. While some universities recommend a bibliography containing every reference cited in the thesis, including all references within published papers, this would create problems here with multiple works by the same author(s) within a given year and has therefore not been adopted in this thesis. The only change made to published works has been in the listing of tables and figures. All tables and figures within each study have been numbered in a way that enables them to be individually identified in the List of Tables and List of Figures at the front of the thesis. This has been achieved by adding a prefix to each table and figure number linking it to the study within which it appears. For example, Table 2 in Paper 3 has been listed as Table P3.2, Figure 1 in Paper 8 has been listed as Figure P8.1 etc. References to each table and figure in the text of each paper have been updated to incorporate these changes.

It should also be noted that the publication nature of this thesis has impacted appreciably on what has eventually been presented within each paper. Almost all scientific journals have word limits, some of them quite stringent, which restricts the details which can be provided and the analyses which can be conducted. Brevity or succinctness is important. An exhaustive analysis of all the data from each study, including descriptions of preliminary data analysis procedures, which is common in doctoral theses and demonstrates thoroughness, is simply not possible when writing for journal submission. Even in cut-down form, a number of the papers in this thesis required further editing, with additional hypotheses abandoned to reduce study complexity, dependent variables excluded to reduce paper length, and methodological explanations shortened. I would ask the reader to be both aware and forgiving of this necessary compromise.

# List of publications relating to this thesis

This doctoral thesis is submitted as a portfolio of peer-reviewed publications according to the 'PhD Rules & Specifications for Thesis' of the University of Adelaide. The journals in which these papers were published or submitted relate to the fields of psychology and dentistry. Citation information for the journals is listed in Table 1 below, with the journals ranked by order of impact factor (*Journal Citation Report 2006*, Thomson ISI). The impact factor, often used as a measure of a journal's scientific significance, is calculated based on a three-year period and can be considered to be the average number of times published papers are cited up to two years after publication. Published impact factors for 2006 range from 0.364 to 6.000 (Median = 1.252) for all dental journals and from 0.161 to 12.725 (Median = 1.884) for all psychology journals.

Table 1

Scientific significance of journals publishing papers forming this thesis

Journal Title	Impact Factor	Total cites	Immediacy Index*	Cited Half-life**
Clinical Psychology Review	3.947	3131	0.649	7.6
Journal of Anxiety Disorders	1.982	1341	0.234	6.9
BMC Psychiatry <sup>†</sup>	1.920	N/A	N/A	N/A
Community Dentistry and Oral Epidemiology	1.870	1927	0.200	9.6
BMC Oral Health <sup>†</sup>	1.250 <sup>†</sup>	N/A	N/A	N/A
Australian Dental Journal	0.568	665	0.089	9.4

\* Immediacy Index measures the average number of times that an article, published within a specific year within a specific journal, is cited over the course of the same year; \*\*Cited Half-life measures the number of years, going back from the current year, that account for half the total citations received by the cited journal in the current year. <sup>†</sup> Unofficial 2006 Impact Factor was established by dividing the number of times articles published in 2004 and 2005 were cited in 2006, based on a search of the Science Citation Index database, by the number of articles published in the previous two years (2004 and 2005).

## Published journal papers

**Armfield JM.** Cognitive vulnerability: a model of the etiology of fear. *Clinical Psychology Review* 2006, 26: 746–768.

**Armfield JM.** Understanding fear of animals: A comparison of the cognitive vulnerability and harm-looming models. *BMC Psychiatry* 2007;7: Art. 68.

**Armfield JM.** Manipulating perceptions of spider characteristics and predicted spider fear: Evidence for the cognitive vulnerability model of the etiology of fear. *Journal of Anxiety Disorders* 2007, 21(5): 691–703.

**Armfield JM.** Perceived uncontrollability, unpredictability, dangerousness and spider fear: A comparison of an imaginal and in vivo encounter. *Journal of Anxiety Disorders* 2008, 22(2): 222–232.

**Armfield JM, Spencer AJ & Stewart JF.** Dental fear in Australia: who's afraid of the dentist? *Australian Dental Journal* 2006, 51(1): 78–85.

**Armfield JM, Stewart JF & Spencer AJ.** The vicious cycle of dental fear: exploring the interplay between oral health, oral health care utilization and dental fear. *BMC Oral Health* 2007;7: Art. 1.

**Armfield JM.** A preliminary investigation of the relationship of dental fear to other specific fears, general fearfulness, disgust sensitivity and harm sensitivity. *Community Dentistry and Oral Epidemiology* 2008, 36: 128–136.

**Armfield JM, Slade GD & Spencer AJ.** Cognitive vulnerability and dental fear. *BMC Oral Health*; 2008;8: Art. 2.

## Submitted journal papers

**Armfield JM.** Personality antecedents of fear: mediation by cognitive vulnerability perceptions. Submitted to *Behaviour Research and Therapy*.

**Armfield JM.** Memory bias for vulnerability schema related spider words and general spider words. Submitted to *Anxiety, Stress, & Coping*.

## Brief overview of papers

This Doctoral Thesis consists of 10 papers which, at the time of writing, have all been either published in, or are in the process of being submitted to, scientific journals. Eight papers have been published and are indexed in the MEDLINE database of citations and abstracts of biomedical research articles. All papers form a body of literature related to better understanding specific fears and phobias generally, and dental fear specifically. Paper 1 presents a new model of the etiology of specific fears to the scientific community. A review of recent and contemporary theories of the etiology of fear serves as a justification for further theorising. This is followed by a description of the Cognitive Vulnerability Model of the etiology of specific fears and phobias and the various aspects and implications of this model are discussed. Paper 2 looks at the association between fear and avoidance of high-fear and low-fear animals and perceptions of the animals as uncontrollable, unpredictable, dangerous and disgusting. The perceived loomingness, prior familiarity, and negative evaluation of the animals are also assessed and information obtained on possible conditioning experiences. Paper 3 reports on an attempt to experimentally manipulate perceptions of uncontrollability, unpredictability and dangerousness related to an imaginal encounter with a spider in order to determine whether there is an effect on self-rated predicted spider fear. Experimental manipulations involve differing information in relation to both the spider and the imaginal task. Paper 4 is a replication and extension of Paper 3, with the effect of manipulating perceptions of the uncontrollability, unpredictability and dangerousness of a spider assessed using both an imaginal and in vivo task involving an encounter with a spider. Paper 5 investigates the relationship between personality variables and fear and aims to determine whether or not this association is mediated by vulnerability-related perceptions. Paper 6 investigates the idea of a cognitive vulnerability schema by testing whether there is an inherent difference in the recall and recognition of schema-relevant spider-related words between people with different levels of spider fear. Paper 7 moves the focus of investigation from animal fears to dental fear, with an epidemiological investigation of dental fear in Australia and the characteristics of those people with high dental fear. Paper 8 looks at what can be called the 'vicious cycle' of dental fear, whereby people with high dental fear delay dental visits leading to poorer oral health which results in more dental problems which ultimately

exacerbates the existing fear. Paper 9 investigates the relationship of dental fear to other fears and also looks at the role of disgust and harm sensitivity in dental fear. Finally, Paper 10 provides a preliminary investigation of the relationship of the cognitive vulnerability-related variables of uncontrollability, unpredictability and dangerousness to dental fear.