



Trait anxiety, trait fear and emotionality: The perspective from non-human studies

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ABSTRACT

Current clinical classifications, and many psychologists, do not distinguish categorically between anxiety and fear. Likewise, the normal language use of these and related terms suggests considerable overlap. However, ethology, behavioural pharmacology and neural analysis all suggest that anxiety and fear are fundamentally distinct at the functional and neural levels – while co-occurring and interacting with each other in many situations. As states with distinct and coherent neural control, anxiety and fear should give rise to distinct personality factors of fear-proneness and anxiety-proneness. However, additional factors are suggested by neural, epidemiological, pharmacological and genetic data, which suggest that a higher order factor of emotionality (potentially equivalent to neuroticism) will contribute to trait variance in both fear and anxiety, and a lower order factor of panic-proneness will contribute to fear, in addition to factors specific to fear or anxiety, *per se*.

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1. Introduction

The editors of this special issue on anxiety asked the authors to answer, each from their own perspective, a series of questions. I was asked to apply the perspective of animal studies. These questions included the following, on which I will focus most below:

1. What are the major differences between trait and state anxiety?
2. To what extent does anxiety (and its disorders; e.g., GAD) differ from fear (and its disorders; e.g., phobia): are fear and anxiety qualitatively or quantitatively different?
3. What are the functional similarities and differences between anxiety and neuroticism?

It turns out that the non-human literature can provide fairly clear answers to these questions, but only on the condition that the questions are first rendered answerable by experimentation. The first task of this paper, therefore, must be to make clear the confusion of meanings in the normal uses of the words “fear” and “anxiety” and also to point out a lack of clarity in this area as to the role of “traits”. These issues are brought into sharp focus by the third question, above, where one might wonder whether it is about state versus trait anxiety, or about anxiety versus fear, or about trait anxiety versus some trait that is a developmental risk factor for trait anxiety. The remainder of this paper will then look

at what can be gleaned from the rat literature. This provides us with quite restricted meanings of “fear” and “anxiety”. It also points us to biological factors that could underlie “traits” and so provides insight into the types of entity that might need to be characterised in the human literature. The overall approach is conceptual and so points the way to animal literatures of potential interest to the human personality researcher rather than attempting proper reviews of those literatures.

It should be noted that the questions asked do not directly link to any particular current theory of personality. This paper should be read in the same way. It deals with elements that could form part of, or identify wholly with, presumed factors in a variety of theories that all link to defensiveness of one form or another. It could be argued that if all such theories ensured a tight link to the biological variables discussed here they would necessarily become integrated into a single theory.

2. Definitional issues

2.1. Fear versus anxiety – the linguistic trap

It is tempting when using English words (or indeed those of any other language) to think that we know what they mean; that others accept our meaning; and indeed that the words must refer to real things (“unicorn” gives the lie to the last of these). However, with fear and anxiety there are multiple possible meanings and, among different people, different definitions. This is illustrated in Fig. 1.

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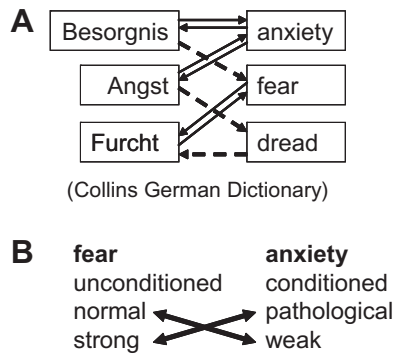


Fig. 1. (A) Diagrammatic representation of the translation paths linked to “fear” and “anxiety” between English and German in Collins dictionary. Different patterns would be expected using other dictionaries but the overall conclusion that words are not easily interchangeable should remain. For explanation, see text. (B) Diagrammatic representation of some of the differentiations between fear and anxiety in scientific and clinical usage. For explanation, see text.

The upper part of the figure maps fear and anxiety between German and English using Collins dictionary.¹ Both “Besorgnis” and “Angst” can be translated as anxiety, and vice versa – creating an instant problem for the English to German translator. However, “Besorgnis” is also translated as “Fear” (but not vice versa), creating a problem for the German to English translator. The fact that if we start off with “Besorgnis” we can finish up equally easily with “Anxiety” or “Fear”, suggests that they are close to being synonyms. Yet, the whole point of the questions posed by the editors of this special issue is to determine the nature of the difference (with respect to kind or amount) of these words. So they clearly do not mean the same. It is also interesting to note, here, that “Anxiety” would normally be translated as “Angst” rather than “Besorgnis”, “Angst” can easily be translated as “Dread”, which is only translated as “Furcht”, which is only translated as “Fear”, which cannot be converted back into “Anxiety” since “Fear” is not translated as “Besorgnis” or “Angst”. These issues are not failings of the dictionary, as such, as there is good evidence that different people do in fact mean different things by the same emotion words (Davitz, 1969) and, if you speak two languages, you will be aware that words simply do not have precisely equivalent meanings. Indeed the lack of words in a language for an entity is why foreign words are imported (e.g., “entrepreneur” from French to English).

But, you could argue, this is just the result of the sloppy use of normal everyday language. The scientific use of the words will be much more exact – and so it is. But it is not less ambiguous. As tabulated in the lower part of Fig. 1, the words fear and anxiety have been distinguished by different authors at different times as unconditioned versus conditioned forms, normal and pathological forms, and strong and weak forms, of what is presumably seen as the same fundamental state. This might seem to make some sort of sense in terms of the implied synonymy of some of the German:English translation pattern but it contains the same type of confusions in that the normal/pathological distinction would usually result in the diametric opposite use of the words to the strong/weak distinction (since the problem with pathological emotions is that they are excessively strong in relation to their eliciting conditions). Thus people are clearly not defining the same two things

¹ Similar conclusions (but not similar mappings) would be obtained with other German dictionaries and with other languages. The mappings include all the German links of the English terms “fear”, “anxiety” and “dread” (the latter being generated from “Angst”) and all the English links of the German terms “Angst” and “Furcht”. The purpose of the exercise is to show there is a linguistic problem – there is no intention of providing a proper semantic mapping.

differently; they are often talking about quite different things while using the same words.

There is an existing literature on the normal everyday use of words that essentially extracts fear and anxiety as separable factors by psychometric analysis of self-reported traits as represented by questionnaire items. However, from a neural perspective, this endeavour may be misguided and suffer from the “unicorn” problem. It may usefully extract entities that reflect the common use of linguistic terms or people’s perception of the world, with no guarantee that the entities referred to exist.

2.2. Fear versus Anxiety – the clinical perspective

Scientists are, especially in the early stages of investigation of a set of phenomena, likely to adopt a variety of positions and associated definitions – each self-consistent, but each different. But, surely, we would expect clinicians diagnosing disorders to have a more coherent perspective?

It is noticeable that in the most recent edition of the DSM (American Psychiatric Association, 1994), the primary source of diagnostic categories for many psychiatrists and psychologists, no real attempt is made to define fear and distinguish it from anxiety. If we go back to DSM-III-R (American Psychiatric Association, 1987), however, a definitional paragraph for anxiety is provided:

“apprehension, tension, or uneasiness that stems from the anticipation of danger, which may be internal or external. Some definitions of anxiety distinguish it from fear by limiting it to anticipation of a danger whose source is largely unknown, whereas fear is the response to a consciously recognized and usually external threat or danger. The manifestations of anxiety and fear are the same and include motor tension, autonomic hyperactivity, apprehensive expectation, and vigilance and scanning.

Anxiety may be focused on an object, situation, or activity, which is avoided (phobia), or may be unfocused (free-floating anxiety). It may be experienced in discrete periods of sudden onset and be accompanied by physical symptoms (panic attacks). When anxiety is focused on physical signs or symptoms and causes preoccupation with the fear or belief of having a disease, it is termed hypochondriasis.”

(DSM-III-R, 1987, p. 392).

This alludes to “some definitions”, equates anxiety with fear at some points but not others and, in general, does not give us any idea what distinction, if any, there is between the two.

2.3. Fear versus Anxiety – a non-human perspective

It might seem that these linguistic problems would be multiplied when we attempt to study fear and anxiety in rats (or other non-human species). After all, we cannot easily ask a rat whether it is “afraid”. Paradoxically, this very translation problem can lead us to a solution. First, we should accept that we cannot know *a priori* what constitutes fearful or anxious behaviour in another species, or indeed whether the words can be transferred from the human to the non-human at all. Second, nonetheless we can study defensive reactions in detail both in the wild and in the laboratory and determine consistencies in the patterns of behaviour that must be driven by specific internal control systems, which we may then be able to label as fear or anxiety systems once we understand their functionality. Third, we can dissect such behaviours pharmacologically and by direct manipulation of the brain. If two behaviours are affected in the same way by the same drug, and two other behaviours are not, then the neural control of the former must be similar in a way that differentiates them from the latter. Fur-

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