

SPECIAL REVIEW

JEFFREY A. GRAY: *The Psychology of Fear and Stress*, 2nd edn. Cambridge University Press, Cambridge (1987). 422 pp., paper bound.

The research reported in this book provides a beautiful example of the way psychology could be more profitably carried out—even if every statement made eventually turned out to be false! This is so because the book is paradigmatic, building on cumulated experimental data, and directly conjoining what is known in many disparate fields (from evolutionary biology to pharmacology to learning theory to criminology). Centering on the multifaceted topic of fear, Jeffrey Gray examines its evolutionary origins (is it adaptive in other animals?); ontogenetic sequencing (how do genetic and environmental influences operate at different ages?); biological underpinnings (conceptual and real nervous systems); and psychological manifestations (personality traits and social behaviour).

The book assumes that psychological phenomena are best understood from an evolutionary and biological basis. Thus a beginning is made with 'fight-flight' tendencies in birds, the expression of emotions in mammals, and the maturational onset of human phobias. Steadily the book becomes more technical. Chapter 4 presents a to-the-point account of selective breeding experiments showing, for example, that rats bred for fearfulness measured by defecation show covariant trait behaviour on other measures of fearfulness, while Chapter 5 gives a lucid tutorial on the physiology of the autonomic and endocrine systems and general adaptation syndrome. (An enhancing feature of the book is that here and elsewhere it is attractively illustrated with four-tone red to black figures). Chapters 6 and 7 become wider ranging, and more speculative, examining the evolutionary basis of sex differences in fearfulness. In humans and other primates, females are more fearful than males, but in rodents this is apparently reversed. Gray's hypothesis is that fear mediates the social interaction that leads to stable dominance hierarchies, and whereas in primates, males and females share overlapping hierarchies (with females, on the average, lower than males), in rodents they do not, as only males establish them.

Chapters 8 through 14 provide the meat of the book, examining the experimental literature on classical and instrumental conditioning of avoidance behaviour; the conceptual nervous system for integrating the experimental findings; and pharmacological studies carried out to test predictions therefrom. Central to these chapters is the "Behavioural Inhibition System". Here Gray demonstrates virtuosity in a series of operations in which the flow diagrams of his conceptual nervous system are mapped onto what is known about the actual nervous system which in turn is interfaced with what is known about pharmacological and conditioning effects in animals all of which are then considered in relation to the interaction of drug and behaviour therapy in treating human disorders.

It is the final chapter which will be especially significant to readers of this journal. Here Gray generalizes his theorizing to human personality and shows how his system differs from Eysenck's. As readers may know, in 1970 Gray provided a reformulation of the Eysenckian model to try to explain better why clusters develop in types of neurotic disorder. While one cluster involved generalized anxiety, depression, excessive guilt, obsessive-compulsive behaviours, and phobias, the other involved antisocial conduct problems including criminality and delinquency. Both Eysenck and Gray viewed both groups as different from 'normal' in being high on Neuroticism, but in Gray's terms they are said to differ from each other in inhibitory behaviour. Those with anxiety disorders tend to be introverted and particularly susceptible to punishment learning while those with antisocial disorders tend to be extraverted and more impulsive and reward oriented. The crux of the difference between Eysenck and Gray is that whereas Eysenck's theory implies that Extraverts are bad at both reward and punishment conditioning, for Gray the extravert is only bad at fear, having a relatively insensitive Behavioural Inhibition System. Under conditions of reward, Gray's theory expects extraverts to learn faster and to be more impulsive. Gray's theory also implies a 45° rotation of the E and N axis in the two-dimensional factor space.

Differential predictions have been derived from the two theories and put to experimental test by several investigators using varied procedures. The results show, in line with Gray's expectations and contrary to Eysenck's, that introverts learn better under punishment, whereas extraverts learn better under reward. This observation has even been made in a practical experiment carried out in a California school using an arithmetic test as the dependent variable (McCord and Wakefield, 1981).

For those wary of frustrative non-reward, the largest dose from the book will probably arise from the almost complete lack of discussion of where Eysenck's P scale fits. Since Gray's 1970 reformulation, Eysenck and Eysenck (1976) have made the P scale bear the weight of explaining antisocial personality disorders. Gray ignores this issue entirely, although perhaps not surprisingly given the small and contradictory degree of evidence on the topic. One can only hope that from these small acorns of confusion and disagreement, mighty oaks of knowledge will grow.

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REFERENCES

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