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Classical eyelid conditioning, psychopathy, and Hans Eysenck's grand theory

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ABSTRACT

The concept of conditionability, usually assessed in classical preparations such as the eyelid conditioning paradigm, was one of the original cornerstones of Eysenck's goal for a grand theory moving seamlessly from biology (inherited and acquired CNS differences), through basic learning, to personality, and to clinical syndromes, including psychopathy and criminal conduct. From a somewhat personal perspective we trace the beginning of classical conditioning research in Eysenck's research programme at the Institute of Psychiatry (Maudsley Hospital), through various technical developments, which eventually led to questions regarding the adequacy of the construct of conditionability itself. Nevertheless, contemporary research on psychopathy, drawing on new approaches to personality theory and sub-types of psychopathic individuals, is still influenced by Eysenck's interest in crime and personality. While most of the details of the original model have been challenged, there is still a surprising consonance between Eysenck's theory and modern approaches to research on the nature of psychopathy. Conditioning studies of psychopathic individuals could still benefit further from insights developed in Eysenck's laboratories.

1. Introduction

Hanging in Hans Eysenck's office at the Institute of Psychiatry were two large portraits, "one of a Victorian aristocrat, the other of a Russian peasant," as he described them in the introduction to *The Biological Basis of Personality* (1967). The Victorian aristocrat was Sir Francis Galton, although the background of his family was that of industrialists and doctors and he was only knighted two years before his death at the age of 88. The Russian peasant was, of course, Ivan Pavlov, although the son of a parish priest isn't quite what we normally associate with being a peasant. Picky details aside, these two pioneers were Eysenck's intellectual heroes, icons of the genetic and constitutional study of individual differences, and the experimental study of functional behavioural relationships, respectively. Classical conditioning, especially individual differences in conditionability, was always a fundamental element in Eysenck's grand theorizing—the big picture goal to move seamlessly from biology (inherited and acquired central nervous system differences), through basic learning, to personality, to syndromes of psychopathology (including psychopathy and crime), and finally complex social and political behaviour and attitudes.

Because of Eysenck's broad interests in all aspects of human behaviour, his theoretical and experimental excursions into anti-social, delinquent, and criminal behaviour were a natural development in understanding the origins of individual differences and the dimensions of personality (Eysenck, 1947). He published a popular book called *Crime and Personality* in 1964, which he saw as the counterpart to his book (with S. Rachman) *The Causes and Cures of Neuroses* (1965), which defined the scientific fundamentals of the emerging field of behaviour therapy. Both works, he claimed, relied on "modern learning theory for their foundations and on experimental work on conditioning for their details" (Eysenck, 1970, p. 12). While conditioning theories of the causes and treatment of anxiety disorders have survived in contemporary cognitive-behavioural therapy—albeit in a modified form—the conditioning theory of crime has had a more erratic history.

Other researchers in those early years were beginning to report weaker conditioning of the galvanic skin response (GSR) to mildly aversive stimuli in psychopathic criminals (Hare, 1965a; Lykken, 1957). Their focus, however, was more specifically directed to the idea that psychopaths acquire learned fear responses less easily than typical individuals, and experience less distress to impending punishment. Eysenck's perspective on psychopathy and crime was much broader, being closely tied to other individual differences in the major dimensions of personality. In this article, we briefly review the major elements of the broader theory and then describe the conditioning research on which it was grounded, focusing specifically on conditioning of the human eye blink.

Based on our own knowledge of the classical conditioning procedures in Eysenck's laboratories at the Maudsley Hospital, we point out some of the operational and conceptual difficulties for the notion of

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conditionability. Despite what we consider key methodological limitations, the broad range of these studies applying Eysenck's ideas to criminal psychopaths deserves recognition, particularly in the way that they have shaped a great deal of contemporary thinking about people with that diagnosis.

We end our discussion with a reflective look at where current scientific understanding of conditioning and psychopathy stands today. While the specific details of Eysenck's grand theory are not much in evidence, his influence can still be seen and, while not always recognized, help guide and shape current research. Refinements in modern and technologically sophisticated approaches to understanding criminal behaviour are especially important for that specific group of individuals who can be designated as psychopaths, given that their treatment and rehabilitation represents significant challenges to society.

2. The basic theory

An essential feature of Eysenck's early theory was that on account of constitutional differences in neural excitation and inhibition, introverts tend to be cortically aroused under resting conditions, do not seek extra stimulation, and are sensitive to but not fearful of social stimuli. (Hans Eysenck liked to think of himself as a stable introvert; once when explaining the difference between introversion and social anxiety, he said in his slight German accent: "I'm an introvert. I'm not *afraid* of people. I just don't like 'zem".) Among many consequences of differences in cortical arousal, introverts typically condition easily and extraverts condition poorly. There was a great deal of support for that basic finding in the research literature (Eysenck, 1965; Levey & Martin, 1981). As regards neuroticism—the other, orthogonal, personality dimension—those individuals who have reactive emotionality (labile autonomic nervous system and limbic system functions) would, under conditions of mild stress, show greater negative affect (fear or anxiety responses) than stable individuals. It followed that emotional responses would readily be conditioned to relevant associated stimuli if these individuals were also introverts. From these tenets emerged the clinical prediction that people with psychoneurotic disorders would be labile ('neurotic') introverts, another relationship well supported by the evidence (Eysenck, 1979; Eysenck & Rachman, 1965).

The kind of individuals, however, who fell into the extremes of the labile extraverted quadrant, as defined by personality questionnaires, were more likely to be psychiatric patients with a diagnosis of psychopathy, men and women in prison, and other individuals involved in such proscribed behaviour as drunk driving. Rather quaintly in today's world, but given the social mores of the time more justifiably then, the personality scores of 'unmarried mothers' were also measured and they too fell into this quadrant (Eysenck, 1961). Extensive studies from a number of different countries all supported this relationship (Passingham, 1972), although Eysenck was always at pains to point out many of the limitations of administering questionnaires to people in unusual and restrictive circumstances, such as prison. And for that same reason he suggested that the link between extraversion and crime was not via the sociable aspects of extraversion, but the tendency of extraverts to be impulsive risk-takers; criminality in adolescents correlates with low perceptions of risk (of being punished or being caught) regarding antisocial acts (Jamison, 1978). Nowadays we tend to interpret that trait as reflecting a relative insensitivity to threat or signals for danger and that psychopaths have difficulty learning from punishment (Arnett, Howland, Smith, & Newman, 1993).

At first, Maudsley eyelid conditioning studies on recidivist prisoners did not distinguish among different types of criminality, for example Field and Brengelmann (1961) reported that conditionability in a general prison population correlated positively with a measure of rigidity but not extraversion or neuroticism. While some criminals may tend to be neurotic extraverts, not all neurotic extraverts will be criminals, and not all criminals are psychopaths. As Eysenck frequently emphasized, and again in his book with forensic psychologist Gisli Gudjonsson (Eysenck & Gudjonsson, 1989), social and environmental reasons why some people end up in prison interact with constitutional causes. There needed to be another link between criminality and the slower conditioning of extraverts. It was here that an elegant concept, now more specific to psychopathy, emerged: that we are socialized in a way that develops a conscience, which inhibits the performance of proscribed, previously punished actions. If what we call conscience is conditioned anxiety (guilt), and if someone does not condition readily, then their conscience will be limited. Lack of a conscience has been considered one of the defining features of psychopathy for a very long time, ever since Cleckley (1941) characterized psychopaths as lacking 'remorse and shame'.

Eysenck's analysis of the forensic consequences of poor conditionability drew on a number of diverse studies, including animal research, suggesting that conscience is a conditioned anxiety response in which the conditioned stimulus (CS) is the performance of a socially prohibited behaviour or the thought of performing it. There is evidence, in a series of little-known studies by Aronfreed (1968); Aronfreed and Reber (1965) that negative emotional responses are conditioned to the proprioceptive cues (muscles, joints, intrinsic movement) provided by either the beginnings of the proscribed behaviour itself, or intrinsic cognitive (verbal and imaginal, see Staats, 2012) stimulus correlates of an incipient transgression that might have been punished by parents during early development. If that were so, then as a child begins to perform a socially forbidden behaviour, some negative affect (guilt) will be elicited, and in order to reduce that negative feeling the behaviour is rapidly terminated (escape) or not fully performed in the first place (avoidance). That is a specific version of the negative reinforcement concept underlying the Mowrer–Miller two factor theory of active avoidance learning (see Evans, 1976a).

3. Issues and challenges

Us graduate students at the Maudsley sometimes joked, misquoting Einstein, that one shouldn't let mere facts get in the way of a good theory. Studies which failed to support Eysenck's grand theory, or flatly contradicted it, tended to be dismissed by him or explained away. But as he and colleagues and students delved deeper and deeper into the complexities of the theory of the origins of psychopathy, it became apparent that any supporting evidence did depend heavily on arbitrarily chosen experimental parameters and unforeseen interactions among variables. For example, with respect to the poor conditionability of extraverts, Eysenck frequently acknowledged that some studies had failed to confirm the relationship, but he attributed this to different researchers using unfavourable parameters in their conditioning studies, such as using an overly long CS–UCS interval. He recognized that conditioning was likely to be a complex phenomenon (Eysenck & Levey, 1972).

A second complication was the issue that "conditionability" could be investigated using any of three standard preparations: heart rate and GSR conditioning typically with mild electric shock as the unconditioned stimulus (UCS), and eyeblink conditioning with mildly aversive puffs of air as the UCS. Within individuals, conditionability estimates do not correlate very well across the three preparations, which is hardly surprising as they are actually rather different paradigms, with heart rate acceleration being a parasympathetic response, unlike the GSR which is sympathetic, and the eyeblink, although a simple, repetitive reflex, is controlled by the skeletal musculature. Although other laboratories confirmed that introversion facilitates conditioning of parasympathetic nervous system activity as well (e.g., Frederikson & Georgiades, 1992), because Eysenck was interested in conditionability as a generalizable personality variable related to extraversion/introversion rather than neuroticism, the Maudsley group relied largely on the eyelid conditioning paradigm. This paradigm made sense in terms of the grand theory, however the concentration on eyeblink conditioning proved to be a somewhat limiting choice, as it happens, for