

Reflections on the Scientific Life of Hans Eysenck

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Abstract

Professor Hans Eysenck's contribution to psychology is pre-eminent: fifty years of uninterrupted research produced a corpus of work that is unrivalled in its breadth and depth, as well as in the controversies that it generated. In this article, I discuss Eysenck's scientific attitude to psychology, with a delineation of the four major principles that guided his research. I focus on his greatest achievement, viz. the development of a viable biological model of personality, and contrast his arousal-based theory with Jeffrey Gray's alternative reinforcement-based theory. In an attempt to understand the multifaceted nature of Eysenck's complex, and at times paradoxical, scientific life, I also discuss some of his more controversial work (race-intelligence, smoking-cancer, and parapsychology). I conclude with personal reflections on Eysenck's style in interacting with students and colleagues in order to highlight some of his finer characteristics (all too infrequently articulated) that help to explain his remarkable success.

Reflections on the scientific life of Hans Eysenck

Hans Eysenck died on the 4th September, 1997, aged 81, defeated in his last battle by a brain tumour. As the first Professor and Head of the Department of Psychology at the Institute of Psychiatry (Maudsley Hospital), he was the most influential psychologist in Britain, and internationally renowned for his scientific contributions to psychology. In recognition of his achievements, he was awarded by the American Psychological Association (APA) the Presidential Citation for Outstanding Contributions to Psychology (1994), the Centennial Award for Lifelong Contributions to Clinical Psychology (1996), and the Distinguished Scientist Award (1988); and from the American Psychological Society, the William James Fellow Award (1994). In addition, Eysenck was the subject of two Festschriften (Lynn, 1981; Nyborg, 1997). The Department that he founded is now one of the leading centres for psychological research in the world. He published some 80 books and over 1,000 scientific articles, spanning a diverse range of topics (e.g., behaviour genetics, experimental psychology, intelligence, personality, cancer-proneness, astrology, and marital satisfaction), along the way establishing behaviour therapy (the forerunner to cognitive-behavioural therapy) and marginalising Freudian therapy. At the time of his death, Eysenck was the most widely cited psychologist in the world. However, his achievements were not officially recognised in his adopted country: regrettably, the British Psychological Society failed to award any marks of

distinction; and, perhaps predictably, given his unwillingness to submit to political dogma, the British Government never considered it appropriate publicly to honour his contribution to science.

In this article, I examine first Hans Eysenck's scientific attitude to psychology, outlining four major principles that guided his research. Then I focus on his pioneering research in personality theory, before considering some of his more controversial writings that have attracted considerable opprobrium. Last, I discuss some less tangible, but nevertheless real, aspects of Eysenck's professional life, including his interpersonal style in working with both students and colleagues which may throw light upon his remarkable success and enduring influence.

This account is necessarily selective, focusing on the highs of his obvious successes as well as the lows of his apparent failings. Although it does not aspire to completeness a task for future biographers this account does aim to give a sense of the multifaceted nature of Eysenck's complex, and at times paradoxical, scientific life.

Scientific principles

Several cardinal scientific principles may be discerned in Eysenck's work. As well as providing a template for ongoing research, they also represent, in common parlance, an *attitude* to psychology (the choice of title for his autobiography, *Rebel with a Cause*, 1997a, reflected this attitude, in which he recorded numerous battles with conventional wisdom and professional dogma).

Principle 1: The two schools of psychology

The first major principle governing Eysenck's research approach relates to the arbitrary divide between experimental (cognitive) and differential (personality) psychology (a division that Cronbach, 1957, famously described in his Presidential Address to the APA). Eysenck (1997b) long argued that this division was harmful to the development of a scientific psychology, and his work was characterised by an attempt to unite these two separate approaches (e.g., by using differential methods to reveal the psychometric structure of personality, and then experimental methods to discover the causal basis of this structure; e.g., Eysenck, 1947, 1957, 1967).

Despite Eysenck's efforts, personality psychology is still largely dominated by statistical (correlation) description of individual differences (epitomised by the Big-5 model of personality), while experimental psychology largely ignores individual differences in its search for (averaged) mechanisms. The published research literature is also largely divided along these lines (a perusal of mainstream human experimental/cognitive psychology journals quickly confirms this fact).

However, there has been real, if rather limited, progress in the inter-relationship between experimental and personality processes. For example, information processing stages, arousal, situational factors, and personality have been extensively investigated (e.g., Revelle, 1987). But the conclusion seems unavoidable: the discipline of psychology, as reflected in professional societies/divisions, scientific journals, organisation of psychology degrees, etc., is still largely segregated into two major schools. Eysenck deserves the credit for encouraging the

unification of these two schools, and for providing the conceptual tools to achieve this aim. However, there is a long way to go before Eysenck's vision of a unified psychology is finally realised.

Principle 2: Biosocial science

The second major principle underlying Eysenck's work concerns the interplay of biological and social factors in behaviour (that is, *biosocial science*). Eysenck's work focused on the interplay of genetical, physiological and learning factors, and sought to synthesise these disparate areas. From his writings, it is clear the point was not that biological and social factors are important in isolation, but it is their *interaction* that is crucial (e.g., conditioning effects depend on physiological processes). That is, failure to consider interactions often lead to misleading conclusions.

But Eysenck was not a biological determinist, and his position cannot be dismissed with simplistic labels (e.g., 'reductionist', 'naïve realist', etc.): biology works in tandem with environmental factors, and its expression is dependent upon environmental factors. There is no biology without the environment, and vice versa; and one is not necessarily superior to the other. Many areas of science, especially social science, prefer the social to be superior to the biological; in other areas, the biological takes causal precedence. Eysenck argued against both views, and in so doing antagonised both camps. However, it is true that Eysenck's theories articulated biological influences in considerably more detail than social factors, so the often hostile reaction of social scientists to Eysenck's work is understandable. But, as noted by Gray (1997a, p. 510), there was opposition from other quarters: "... what I have never fathomed is the opposition from the mainstream of British experimental psychology" (which includes biological psychology).

It is still a deeply disturbing principle to many that the experimental/biological and social have to be considered together. To many researchers, these are very different conceptual domains with little overlap. It is difficult to disagree with Eysenck's insistence that this belief is surely misguided. An impartial evaluation of the moderating role of personality across the whole cognitive-behavioural landscape lends empirical support to Eysenck's interactionist position.

Eysenck's biosocial principle was especially relevant back in the heyday of radical environmentalism, which promised improvement of society by the application of Skinnerian procedures. At that time, Eysenck's assertion that genetics and physiology could be crucial factors in determining personality, intelligence, attitudes, etc. was held by many to be a self-evident nonsense, espoused only by the politically motivated or scientifically inept (two accusations levelled at Eysenck). Today, it is truly remarkable that the principle of biosocial science, advocated by Eysenck forty years ago, is seen to verge on common sense. But, although few psychologists today would wish to argue against this biosocial principle, it is sobering to see the extent to which this principle is neglected in much of the psychological literature. For example, children are still taught without adequate consideration of their (biologically influenced) personalities (Eysenck, 1996); social psychology rarely pays adequate attention to traits of biological influence; the vast majority of cognitive experiments do not consider moderating effects of personality processes (for a discussion of the importance of individual differences in cognition, see Revelle, 1987); and biological

approaches usually ignore the importance of individual differences in the functioning of major systems. Therefore, most psychological research is not guided by the principle of biosocial science: it is not yet common practice to consider jointly the interaction of biological and social processes.

Principle 3: Theoretical rigour and empirical data

Hardly radical, but nonetheless disturbing to many, was Eysenck's demand that scientific arguments require theoretical rigour and empirical data, not blind faith, however professionally respectable. In this context, it is interesting to note that Eysenck's early career ambition was to study physics, which was thwarted by his lack of the necessary entry requirements to the University of London; instead, he opted for an alternative science subject for which he was qualified, which by chance was psychology. His approach to psychology was based on a physics model of experiment and theory, which has served the natural sciences well for many centuries. According to this natural science approach, a scientific investigation consists of methodological procedures for gathering data that are reliable across observers, and logically separate from the topic of study (that is, the scientific method does not prejudice the nature of observations). Eysenck was concerned with measurement: if a thing existed then it existed in some quantity and can therefore be measured. The notion that psychology was somehow special, requiring a fundamentally different analytical approach to the older and successful natural sciences did not appeal to Eysenck. This attitude was opposed to Freudian notions, in particular. He was rightly suspicious of theories that eschewed measurement in favour of subjective interpretation. Mainstream academic psychology and psychiatry have now largely adopted this principle.

Although Eysenck adopted the very sensible stance of applying tried and tested approaches from the natural sciences, to many people this form of empiricism fails to capture the uniqueness of individuality (e.g., Allport, 1937), or the vital spark (sometimes couched in quasi-spiritual or religious terms) of the human mind. Eysenck's attitude repulsed many opposed to the notion that the human mind can be measured and analysed like any other phenomena in nature. Today we see a resurgence in qualitative methodologies, some, but not all, of which (e.g., discourse analysis) explicitly reject the notion of an objectively quantifiable science (for a recent debate in *The Psychologist*, see Cooper & Stevenson, 1998; Morgan, 1998a, b; Sherrard, 1998).

It is interesting to note that the major advances in personality research - an area of psychology which may seem especially difficult to study objectively - has come from the application of Eysenck-type methods and not from alternative, qualitative based approaches (see Depue & Collins, 1999).

Principle 4: Scientific freedom

Another important principle running through Eysenck's work concerns the role of the scientist in society. Eysenck argued that it is the duty of the scientist to differentiate between, as they see it, sense and nonsense, even at the expense of professional, public and political sensitivities. According to Eysenck, the *raison d'être* of scientists is to explore the truth as they see it, not to pander to prevailing conventional wisdom. According to this view,

scientific statements should be driven by hypothesis and data, not political exigencies, even those espoused in the name of the public good.

This principle may seem uncontentious, even banal: surely all scientists endorse the view that truth should be sought for its own sake irrespective of external, particularly political, pressure. Eysenck noted, however, that this principle is often sacrificed in practice to societal demands (e.g., external funding that is directed to well intentioned, but nevertheless politically inspired research themes). Such external pressures exert subtle effects on research agendas, especially in environments where assessment is based upon consensual, but essentially subjective, judgements of research excellence (often indexed by amount of external funding generated). Much of the criticism directed towards Eysenck's work may be traced to his unwillingness to yield to these pressures and to his insistence that he had the right to express his views regardless of what others thought of his views.

In the case of political interference, Eysenck was surely justified in arguing that only time can decide the ultimate scientific value of research, and scientists should be left to pursue their chosen lines of inquiry without impedance: history shows the many examples of the disastrous outcome of political meddling in science. However, political meddling can take many different guises, the more successful of which achieves its aims by subtle forms of manipulation. Eysenck was aware of these subtle influences and seemed to adopt the defence of outright defiance to any form of interference with his work: frustration of these subtle forms of manipulations often led to personal abuse of Eysenck as well as the withholding of the badges of official recognition (his pre-war experience of Nazi Germany may have influenced this attitude of defiance; see below).

The fact that Eysenck was willing to promote findings that others felt must be false is instructive. For example, the promotion of Grossarth-Maticek's data on personality and cancer-proneness was widely condemned (see Eysenck, 1997a). Irrespective of the validity of these data, Eysenck's willingness to consider potentially important new research avenues was admirable; the fact that he felt that he had to defend these data in the face of opposition was perhaps understandable. Principle 3 (theoretical rigour and empirical data) ensures the integrity of science: science is ultimately a self-correcting process and will weed-out false claims. Perhaps a worse scientific sin than defending questionable theory/data is not considering it in the first place: all too often, orthodoxy begins as heresy.

Eysenck noted in his autobiography that the heretic should always expect a hard time at the hands of the Establishment of the day. It is clear that in much of his work, Eysenck could have pursued a more cautious approach adopted a more conservative response bias, in signal detection terminology but would that have enhanced his scientific contribution to psychology? No doubt, it would have enhanced his professional reputation and led to greater public recognition of his real contribution to science: he seemed to have decided that his contribution to psychology was of greater value than his own professional standing, and he seemed willing to pay the personal price for pursuing unpopular topics that he considered to be scientifically important.

Biological basis of personality

Perhaps Eysenck's greatest scientific achievement was his biological theory of personality. The development of this theory illustrates the use to which Eysenck put the four principles

adumbrated above. Discussion of his personality theory also helps to illustrate the manner in which Eysenck conducted scientific business on a practical level.

Eysenck's professional career took off with the publication of *Dimensions of Personality* (1947), which laid the statistical groundwork for the postulation of two major dimensions of personality (introversion-extraversion and stability-neuroticism). 1957 saw the publication of *The Dynamics of Anxiety and Hysteria*, which provided a causal basis to personality, based upon Pavlovian and Hullian learning principles; and 1967 saw the publication of a full-blown physiological account of personality (principles and research are summarised in Eysenck, 1997a). According to Gray (1981), this physiological theory "... bestrides the field of personality like a colossus" (p. 246), and likens it, in the uncharted *terra incognita* of personality psychology, to "... stumbling across St. Pancras Station in the heart of the African Jungle". Now, as with any scientific theory, Eysenck's personality theory may be criticised on logical and empirical grounds; and, given the clarity and precision with which he expounded his theories, this has proved comparatively easy. The major challenge came from one of Eysenck's own research students, and his successor at the Institute of Psychiatry (IoP), Professor Jeffrey Gray (1970, 1981); other challenges came from researchers such as William Revelle's research group that focused on extraversion and arousal (e.g., Humphreys & Revelle, 1984; Revelle, 1987, 1997; Revelle, Humphreys, Simon & Gilliland, 1980), and from new approaches inspired by developments in cognitive psychology. (The most comprehensive evaluation of Eysenck's personality theory is Matthews & Gilliland, 1997.)

The Personality Research Group at the Institute of Psychiatry (IoP)

In the late 1980s, Professors Eysenck and Gray gathered around them a group of personality researchers (the Personality Research Group, PRG) to discuss and plan research to compare and contrast Eysenck's and Gray's theories. (Early members of the PRG included Drs Alan Pickering, Glenn Wilson and Irene Martin, and doctoral students Hermina Sanders and Philip Corr.) It is instructive to recount briefly the outcome of this scientific collaboration, both for the validity of the major tenets of Eysenck's personality theory as well as his style of doing science.

Eysenck's arousal theory

Eysenck's (1967) theory postulates that introverts and extraverts differ with respect to the sensitivity of their cortical arousal system in consequence of differences in response thresholds of their reticulo-cortical ascending activating system (ARAS). Compared with extraverts, introverts are postulated to have lower response thresholds and thus higher cortical arousal. In general, introverts are said to be more cortically aroused and more arousable when faced with incoming sensory stimulation. However, the relationship between arousal-induction and actual arousal is subject to the moderating influence of transmarginal inhibition (TMI: a protective mechanism that breaks the link between increasing stimuli intensity and behaviour at high intensity levels): under low stimulation (e.g., quiet or placebo), introverts should be more aroused/arousable than extraverts, but under high stimulation (e.g., noise or caffeine) introverts may experience over-arousal, which with the evocation of TMI may lead to lower increments in arousal as compared with extraverts;

conversely, extraverts under low stimulation should show low arousal/arousability, but under high stimulation they should show higher increments in arousal. A second dimension, Neuroticism (N), is related to visceral activation and emotional instability (for a review of this literature, see Corr, Pickering & Gray, 1995a; Matthews & Gilliland, 1999).

Gray's reinforcement sensitivity theory

Gray's (1970, 1981) alternative theory of personality is based upon reactions to conditioned stimuli of reward and punishment. This approach is now acknowledged as a major theoretical contribution to the neuropsychology of emotion and personality (e.g., Depue & Collins, 1999; Zuckerman, 1991).

Building on Eysenck's factorial work on E and N, Gray (1970) argued for a rotation of Eysenck's E and N dimensions to align more closely with biologically-causal brain systems. In Gray's model, Anxiety (Anx) ranges from E-/N+ (Anx+) to E+/N- (Anx-, inclining more towards N than E); orthogonal to Anx, Impulsivity (Imp) ranges from E+/N+ (Imp+) to E-/N- (Imp-, inclining more towards E than N; Pickering, Corr & Gray, 1999).

Over the years this theory has been developed to include three major systems of emotion. (1) The *behavioural inhibition system* (BIS) is the proposed conceptual substrate for Anx and is sensitive to secondary aversive stimuli (i.e., punishment and the omission/termination of reward), extreme novelty, high intensity stimuli, and innate fear stimuli (e.g., snakes, blood). (2) The *behavioural approach system* (BAS) is the proposed conceptual substrate for Imp and is associated with secondary appetitive stimuli associated with reward and the termination/omission of signals of punishment. Gray's theory assumes that E and N are derivative factors of the more fundamental Anx and Imp: E reflects the balance of BIS and BAS strengths, N their combined strengths.

Briefly, Gray's theory assumes that Eysenck's arousal effects (most strongly associated with extraversion) are the result of sensitivity to different classes of reinforcing stimuli: *ex hypothesi*, on average punishment is more arousing than reward, and introverts are sensitive to punishment, therefore introverts experience more induction of arousal and are more highly aroused. According to Eysenck, reinforcement effects are the consequence of arousal level. (For detailed delineation of theoretical predictions, see Corr, Pickering & Gray, 1995b.)

Experimental data

A number of studies were conducted by members of the PRG (findings relevant to Gray's theory are discussed in Pickering, Corr, Powell, Kumari, Thornton, & Gray, 1997). In brief, it has proved difficult to provide strong and consistent support for Gray's model. The Group has managed to accumulate a number of positive results (e.g., Corr, Wilson, Fotiadou, Kumari, Gray, Checkley, & Gray, 1995c; Corr, Pickering & Gray, 1997), but these results are largely limited to the association of anxiety and punishment, not impulsivity and reward; most often data, while not supporting Eysenck's arousal theory, fit Gray's model only with post hoc explanations (e.g., Corr et al., 1995b).

In contrast to Gray's theory, Eysenck's arousal theory is comparatively easy to confirm, across a range of performance measures. In the studies discussed below, the strategy

has been to take a broad sample of personality measures (personality scores were not preselected, thus potentially biasing the sample in favour of one theory). For example, in our own laboratory, we have found consistent interactions of arousal and extraversion, which strongly support Eysenck's theory. Corr et al. (1995a) reported extraversion x caffeine effects on two very different task measures: critical flicker/fusion frequency (CFF) and procedural learning. In addition, Corr and Kumari (1997) found that (haloperidol-induced) de-arousal and extraversion interacted also to influence CFF and procedural learning in a manner consistent with Eysenck's theory. It is impressive that Eysenck's theory receives such comparatively easy empirical support. (However, there is a continuing debate concerning the implications of these and other data, e.g., time of day effects, for Eysenck's general theory of personality and neurosis, but this debate is beyond the scope of the present article; see Matthews & Gilliland, 1997.)

It is interesting to compare the prediction concerning procedural learning, based upon Eysenck's arousal theory, with the common view in cognitive science which argues that procedural learning measures "owing to their phylogenetic antiquity, will show less individual-to-individual variation than comparable explicit [learning] processes" (Reber, Walkenfeld & Hernstadt, 1991, p. 894). Principle 2 (biosocial science) predicted an effect of arousal and personality long ago. The interaction of arousal and extraversion supports Eysenck's repeated assertion that personality and the causal mediators of personality (e.g., arousal) have profound effects across a wide range of processes, including phylogenetically old processes.

Such data support Eysenck's claim that experimental factors and individual differences are related synergistically. In the caffeine studies discussed above, if personality had been ignored then the main effects of caffeine would have appeared to be non-significant, leading to the spurious conclusion that caffeine does not influence cognitive performance (the E-caffeine crossover interaction is responsible for rendering the main effect of caffeine non-significant).

From this research programme of the PRG, it is now clear that Eysenck's physiological theory provides only a partial account of the complex physiological processes underlying the main factors of personality: consistent, although complex, effects of reinforcement and Anx/Imp are found which do not fit into Eysenck's arousal model in any simple or sensible fashion (Matthews & Gilliland, 1999). Research from members of the PRG points to the conclusion that both Eysenck's and Gray's theories are valid, but relate to different personality processes. It is evident that if Eysenck and his intellectual successor, Jeffrey Gray, had not co-operated in this programme of research then we would have been no closer to establishing the relative merits of each theory. The clarity and precision with which Eysenck expounded his theory made it relatively easy to identify its weaknesses as well as its strengths.

Many questions remain to be answered in this research programme. Pickering et al. (1997) concluded their survey of the empirical status of Gray's reinforcement-sensitivity theory by noting that "Final understanding may require that we trace ... detail from the molecular genetic bases of individual differences, via the neuroanatomy and neurochemistry of the brain systems that these genetic factors influence, to the eventual behavioural interactions with a complex and changing environment for which these brain systems are responsible. But this, of course, is exactly what Eysenck's own massive contribution to the field had always led us to expect" (p. 63).

In biological investigations of personality today, it is to Eysenck's research programme, guided by the scientific principles delineated above, that researchers still look for inspiration. This inspiration is not driven by the slavish adherence to theoretical dogma, but by an appreciation of the fecund nature of Eysenck's work.

Dimensions of controversy

We may also inspect what many consider to be the debit side of the balance sheet. As Rawles (1998) noted, several dimensions of controversy are evident in Eysenck's work. I consider three dimensions of controversy: (1) race and intelligence, (2) smoking and cancer, and (3) parapsychology.

Race and intelligence

The genetic basis of intelligence, especially as it relates to group differences, inflames great passions. Eysenck fuelled these flames by his dispassionate, neutral stance, as for example in his book, *Race, Intelligence and Education* (Eysenck, 1971), in which it is evident that his conclusions are cautious, being showcased with the usual caveats and not proven verdicts. But given the great sensitivity and importance of this issue, his style of writing was somewhat incautious. One could, unfairly, select passages out of context to condemn Eysenck from his own pen, with the emotive words "genetic", "coloured groups", and "inferiority" used in the same sentence (e.g., Eysenck, 1971, p. 9). But Eysenck was a liberal on these matters: "My recognition of the importance of the racial problem, and my own attitudes of opposition to any kind of racial segregation, and hatred for those who suppress any sector of the community on grounds of race (or sex, or religion) were determined in part by the fact that I grew up in Germany, at a time when Hitlerism was becoming the very widely held doctrine which finally prevailed and led to the death of several million Jews whose only crime was that they belonged to an imaginary 'race' which had been dreamed up by a group of men in whom insanity was mixed in equal parts with craftiness, paranoia with guile, and villainy with sadism" (1971, pp. 9-10). Eysenck's words speak loudly and clearly. However, the fact that he was even willing to consider evidence purporting to show innate differences (some favourable, others less so) between different groups was enough for many to condemn him without a fair trial.

Suspicion concerning Eysenck's motives was further fuelled by his acceptance of money from the Pioneer Fund (a controversial organisation which funds the genetical study of individual and group, racial differences; see Sedgwick, 1995) to support his biological study of intelligence. The fact that UK government funding was unavailable to support this work was largely responsible for Eysenck's willingness to take money from this questionable source. But should he have abandoned his work on this important scientific problem because of the unwillingness of the research councils to support him? An unwillingness to accept Pioneer Fund money may have led to a less tarnished professional image, but would it have led to better science? The answer to this question must remain a matter of debate and opinion; and, to Eysenck, that was the important point: should we rest content with letting opinion decide whether we pursue a scientific issue? It would be naïve to assume that the source of funding has no influence upon research; but it would be equally naïve to assume that it necessarily

corrupts research. Given Eysenck's tough-mindedness, it is unlikely that the source of this funding influenced the direction of his research. What many social scientists resented was the very fact that this funding allowed him to pursue his research at all.

Eysenck's reputation was also tainted by his apparent endorsement of the work of controversial authors in the race-intelligence literature. Even sympathetic colleagues thought it imprudent of him to be seen to be supporting certain 'race realists', whose scientific and political motives were less easy to separate than Eysenck's own. Eysenck was often found guilty by association.

Society, including the psychology community, has still to negotiate what constitutes legitimate free speech from the violation of the principle of free speech. But who is to decide what constitutes legitimate free speech? Eysenck seemed to adopt the view, shared by many social philosophers, that the mark of true freedom is tolerance of others' opinions, however unacceptable, even vile, they may appear: but tolerance does not necessarily imply endorsement. Eysenck was careful to advance possible causes only when the data was available, knowing that the self-correcting mechanism of science would ultimately decide the issue one way or the other. He was willing to lean into the, often fierce, winds of controversy to uphold this principle of free speech.

In this context, *ad hominem* criticism, often consisting of accusations of right-wing affiliation, stood uneasily alongside the fact that Eysenck had first-hand experience of the true nature of right-wing (i.e., authoritarian) politics: his pre-war experiences in Germany, which he left in 1934 to escape the Nazism that he so despised, prepared him well for the times he experienced extreme intolerance during his career (including physical assault).

However, it cannot be denied that a minority of Eysenck's writings could be seen as giving (unintentionally) succour to right-wing groups interested in any scientific evidence that they could cite in support of their prejudiced opinions concerning the inferiority of certain racial groups. Although Eysenck cannot be held responsible for the vile representation of his work, we may wonder whether, with the benefit of perfect vision of hindsight, it was wise to publish *Race, Intelligence and Education* in the form of a popular book with few references given in the text. Reassurance by Eysenck that he had read all the primary sources was unlikely to impress his opponents; nor was it likely to foster the correct opinion that the issues at hand are highly complex. Academic readers too were left with a literature hunt on their hands if they wished to consult primary references.

As I shall argue in relation to parapsychology, it was as if the more controversial the topic, the less cautious and more apparently cavalier was Eysenck's writing (although not necessarily less accurate or valid). This style of presentation could only have encouraged the idea - common currency in many circles - that the ideas in *Race, Intelligence and Education* were more fantasy than fact. Surely this issue was so important that it demanded nothing less than a completely thorough going presentation of the theories and data?

Smoking and cancer

A second topic that was a cause of controversy involved the putative moderating influence of personality on the smoking-cancer association. Eysenck was influenced by the work of Sir Ronald A Fisher (1959), the eminent statistician, who first drew attention to the correlational nature of the smoking-cancer link. Eysenck did not claim that the smoking of cigarettes did

data to support their claims; personality psychologists did not like being told that they should apply nomothetic methods and statistical tests; the medical establishment did not like being told that individual differences in temperament (e.g., relating to stress and immune functions) might be an important factor in the aetiology and treatment of physical disorder; sociologists did not like being told that genetics and physiology may underpin individual and collective behaviour. To suggest in the 1950s that communism was cut from the same psychological cloth as fascism stuck in the throats of idealistic Soviet-sympathisers, including card-carrying members of Eysenck's own staff (other examples are recorded in Eysenck's, 1997a, autobiography). Many of these issues have now been resolved: it is perhaps to Eysenck's credit that he was willing to challenge conventional wisdom rather than pursue the path of least resistance to scientific mediocrity (although greater official recognition!).

It was as if Eysenck was waging a war of attrition on several fronts, never willing to yield ground even when the battle lines had been redrawn. As Gray (1997b, p. xii) noted, "Hans probably went on for too long saying an issue is still open" when new evidence suggested otherwise. Reading Eysenck's autobiography one gets a strong sense that he did not like being pushed around, whether by brown-shirted bully boys in pre-war Nazi Germany, fellow fire-watchers in war-time London, or the psychiatric establishment. We can only guess what influence the experience (some personal) of the horrors of Nazi Germany had on the formation of his attitudes (for many years he refused even to use his native German language).

Personal reflections

As noted by Gray (1997b), "It is a truism to say of almost anyone that he is a person full of paradoxes, but one that applies to Hans Eysenck in spades" (p. xi). It might be informative to recount some first hand encounters, as well as published reflections, on Eysenck, especially as they relate to the intangible aspects of his professional life.

Rarely mentioned was Eysenck's generosity and encouragement willingly offered, especially to younger members of the profession, including students, who warmed to him because he never adopted the precious persona beloved of some professors. Two examples illustrate the typical student encounter, that many others and I experienced when meeting Eysenck over morning coffee (10.30 am) in the Institute of Psychiatry (IoP) canteen.

Eysenck's introduction to Ian Deary was by way of a letter describing Deary as someone who wrote modern poetry, tended to wear black nail polish and wore an anarchist badge. Deary stated that:

I recall my first interview with Hans clearly. Despite my being a mere medical student, he offered unlimited time and courteous attention. When we went for coffee in the Institute of Psychiatry tearoom he bounded up the stairs faster than I could follow, and he ate a packet of Maltesers with his drink. He seemed to let me take charge of what turned out to be a long conversation; I hadn't expected such a fluent and witty writer to be so introverted. He didn't waste words; he made good use of them. (Deary, 1997, p. 283).

Deary was later to abandon psychiatry to pursue the biological and cognitive bases of

intelligence, a topic that Eysenck (1967) pioneered.

Much earlier, Jeffrey Gray had a similar encounter.

When I was a graduate student in Hans' Department (in the early 1960s), I arranged my first ever *tête-à-tête* with the great man to discuss some research I was thinking of doing. My business was over in a quarter of an hour and I waited to be dismissed. There was a silence; embarrassed, I started talking again, and he politely listened. This happened over and over again until finally, two hours after the meeting began, it dawned upon me that it was up to me to bring it to an end. Only later did I discover that he wasn't simply enjoying my idle conversation, he just doesn't like telling people to leave. (Gray, 1997b, p. xi).

I, too, witnessed on several occasions the very same behaviour: obviously, a highly stable trait of Eysenck's personality!

These encounters may seem trivial, even sycophantic: they are neither, for they illustrate an important feature of Eysenck's daily scientific life. These meetings served several important scientific functions: they allowed the free flow of ideas with one of the leaders of psychology; a chance to discuss ongoing and planned research, and receive useful feedback and resources; and the opportunity to meet many of the visiting eminent scholars at the Institute of Psychiatry (IoP) attracted by Eysenck's work. Such rich scientific exchanges promoted a lively research culture, and was no doubt an important part of the success of the Department of Psychology at the IoP. As noted by Arthur Jensen:

We all talked shop and little else every day at morning coffee, at lunch, and at afternoon tea. Rarely have I encountered a group of researchers more involved and excited in what they were doing. Eysenck's own powerful commitment to his research, I felt, had a lot to do with it (quoted in Eysenck, 1997a, p. 153).

Over one such morning encounter, Eysenck drew Arthur Jensen's attention to an article on choice reaction time and intelligence, a research area to which Jensen has since made a considerable contribution (see Jensen 1997).

Within Eysenck's Department, and among those who knew and worked with him closely, his talents and personal qualities were freely acknowledged. As noted by Wilson (1998), "He was also a great inspiration to his students and colleagues, arguing openly and without jargon, and establishing an atmosphere that was intellectually stimulating and open to freedom of enquiry" (p. 78). Eysenck's successor, Gray (1997a), stated that his "contribution to the development of a scientific psychology, able to provide the basis for effective psychotherapy, was outstanding, assuring him a place of honour in the history books" (p. 510).

On a more personal level, to students, colleagues, friends and family Eysenck was known as a gentle, quiet and good-humoured man, who seldom spoke ill of others, and who surprised many who met him for the first time with his mildness and moderation: these characteristics were in contrast to his public persona, which displayed all the features of a

gladiator. The fact that he was willing to speak his mind in public, addressing *ad rem* issues, rather than resorting to private *ad hominem* slurs, warmed Eysenck to many who knew him. Eysenck inspired scientists, as well as the wider public, by his lucid writings; but he also inspired by his dedication, good-nature and personal integrity that was evident to those that knew him.

Terminally ill with brain cancer, Eysenck attended the International Society for the Study of Individual Differences, which he had founded: as Gray (1997a) noted, "the admiration and affection he evoked at that meeting were palpable and deeply moving" (p. 510). To those not familiar with the person, only his writings, such sentiments may seem misplaced, but then Eysenck was a man of paradoxes: in public, an intellectual titan ever ready to enter the fray; in private, a shy and reserved good-humoured person generous with his time and support.

In conclusion, Eysenck's scientific legacy is not a Freudian-like dogma that only brave heretics dare challenge, but rather a set of guiding principles and viable empirically-based theories open to challenge and modification. Eysenck seemed to ask the right research questions long before others, provided the conceptual tools of investigation, and suggested answers that still hold sway today. He also displayed personal characteristics that attracted genuine respect and admiration. That his theories encouraged criticism and modification, often by the very students he helped to develop, is testimony to the progressive nature of Hans Eysenck's life and work. Eysenck's insistence on scientific rigour, coupled with a genuine open-mindedness and respect for new empirically verified ideas, is an example of how to foster research excellence and build a true science of psychology. That he was willing to consider controversial areas of psychology, as well as defending controversial scientists, may be seen either as foolhardy or commendable; but, at the very least, it served to defend the principle of free speech that his country of birth denied to him as a young man. The choice of quotation, from T. H. Huxley, in the Introduction to his autobiography is apt: "My business is to teach my aspirations to conform themselves to fact, not to try and make facts harmonize with my aspirations".

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