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BEHAVIOURISM AND PSYCHOLOGY

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1. BEHAVIOURISM AND NATURALISM

Behaviourism was a peculiarly American phenomenon. As a school of psychology, it was founded by John B. Watson (1878-1958) in 1913, and grew into the neobehaviourism of the 1920s, 1930s, and 1940s. Philosophers were involved from the start, perceiving the movement and its tenets and moving towards defining and redefining the tenets. Behaviourism expressed the naturalistic bent in American thought, which became apparent in the prevailing philosophical idealism and was inspired by developments in natural science itself.

There were several versions of naturalism in American philosophy, and also several behaviourisms (Williams 1993; O'Neil 1995). Most behaviourists paid homage to Darwinian functionalism; all foresee introspection and the made-up changes in the primary subject matter and explanatory domain of psychology. Most behaviourists acknowledged that scientists begin from their own conscious experience, but denied that such experience could be an object of science or a source of evidence in psychology. They differed in their description of behaviour, modes of explanation, and attitudes towards mentalistic concepts. Watson was a strict materialist who wanted to eliminate all mentalistic talk from psychology. Edward Chace Tolman (1886-1959) regarded mind as a biological function of the organism. He permitted mentalistic terms such as 'purpose' in behavioural description, and postulated intervering processes that included 'representations' of the environment, while requiring such processes to be studied only as expressed in behaviour. Clark L. Hull (1884-1952) developed a hypothetical-deductive version of behaviourism, akin to Tolman's functionalism in postulating intervering variables but without his cognitivist construct. B. F. Skinner (1904-90) rejected intervering variables and developed his own account of the behaviour of the whole organism, based on the laws of operant conditioning.

The naturalism in American philosophy of the early twentieth century showed respect for the natural sciences, especially biology and psychology. John Dewey

2. BIRTH OF BEHAVIOURISM IN PSYCHOLOGY

After the turn of the century there was increasing interest in behaviour as a subject matter and form of evidence in psychology, and as an objective expression of mind. Both philosophers and psychologists were growing sceptical of introspection as a method for knowing mind. They believed traditional introspection had to rely on unshakable inference from analyses to extend its first-person results to other humans and to animals. Among philosophers, Perry (1930) and E. A. Singer (1911) promoted behaviour as a means of perceiving mental functioning in humans that allegedly would not depend on introspective analogies. Psychologists (e.g., Warren 1914) partly prompted by biological study of animal behaviour (e.g., Jennings 1908), called for greater attention to objective factors in human psychology. Behavioural evidence was touted by the comparative psychologists Thorndike (1896), Washburn (1908), and Yerkes (1909), but despite Yerkes' claim to the contrary (1917, p. 135), that did not make them behaviourists, for they used such evidence to frame theories of the traditional subject matter of psychology, consciousness or mind regarded as an object of introspection.

Other psychologists argued that the very subject matter of psychology should be changed, from consciousness to behaviour. Williams McDougall (1905, 1912), then at Oxford, and Walter Pilbrow (1911) at Michigan proposed to define psychology as the science of 'conduct' or 'behaviour'. But they did not ban introspective methods for finding the mental causes of behaviour (McDougall 1905: 2, Pilbrow 1911: 3), and McDougall was an ardent dualist (1911: ch. 26). Behaviourism did not arise from making behaviour the primary evidence or subject matter of psychology. It arose from a strict repudiation of introspective methods and a proposed change in the theoretical vocabulary of psychology.

Behaviourism as a self-conscious movement was initiated by Watson in two articles (1913a and b) and two books (1914, 1919). He proposed changing psychology's subject matter, evidence, and theoretical vocabulary. The subject
manner would now be behavioural, described as muscle movements and glandular secretions; the evidence would be this same behaviour, along with a physical description of the stimulus setting, the theoretical vocabulary of reflex arcs and Pavlovian conditioned learning would be used to explain stimulus-response relations. Animals were to be regarded as complete machines whose current behavioural propensities are a function of innate structure and previous stimulus exposure. Insectic is were to be minimised, and could perhaps be explained through Lamarckian inheritance of acquired characteristics (1934: 174). What a complex animal does is primarily a function of its reactory or conditioning biography, that is, its history of observable pairings of stimulus and response. While Watson believed that the chain of events from stimulus to response would eventually be accounted for in purely physical-chemical terms, he offered behaviourism as the science that would presently lead to the prediction and control of animal behaviour. Behaviourism differs from physiology in studying the responses of the whole organism, but Watson permitted postulation of unobserved physiological states (glandular or muscular). Nonetheless, everything of importance is in principle available at the periphery of the organism; ‘there are no centrally initiated processes’ (1938: 432).

Behaviourists approach human and other animals alike. If one must account for the processes previously labelled ‘thought’ in humans, they should be seen as laryngeal sublocalisations (again, in principle detectable at the surface of the throat). Emotions are to be equated with glandular secretions and genital tumescence. Perception is a matter of sensory discrimination as manifested through differential behavioural response, including, for humans, verbal response. As Heidegger observed, Watson wanted to extend ‘the methods and point of view of animal psychology into human psychology’ (1933: 216). It was not just any animal psychology, but the mechanistic version propounded by Jacques Loeb, who taught Watson at Chicago (where he took his PhD after studying philosophy and psychology at Furman University in Greenville, South Carolina). Loeb (1900) considered himself a biologist and an opponent of ‘nanomechanical psychology’, which drew analogies between human and animal cognition based upon introspection. Even the animal biologist H. S. Jennings (1900), at Johns Hopkins where Watson arrived in 1908, permitted attribution of consciousness down the phylogenetic scale to amoeba and paramecium. But Watson’s comparative psychology, and his gestalt psychology of humans, were to be of the Loeb style — mechanistic, materialistic, and deterministic — and for that reason presumably objective and scientific. Watson left Heidegger in 1930 and went into advertising, where he flourished. When after 1930 he withdrew from psychology, behaviourism was on the way up; the young Skinner (1935: 299) and W. V. O. Quine (1951: 310) had already been drawn to Watson’s variety.

3. PHILOSOPHICAL AND CRITICAL RESPONSES

Watson’s articles drew immediate response from both psychologists and philosophers. Sustained discussion occurred in the Psychological Review and the Journal of Philosophy, Psychology and Scientific Methods (which published psychological articles and results even after abbreviating its name in 1941). Titchener (1934) argued that Watson’s new movement was not really new. Its criticisms of introspection could be found in Comte and Mandeville. Its positive teaching should be seen as a continuation of the biological study of animal behaviour, something Titchener welcomed, including its extension to humans, but which he believed neither could nor should be connected with mentalistic psychology. Angell 1935 was more favourably disposed to the new movement, though he refused to forgo introspection.

Among philosophers, Dewey (1914), Holt (1915, 1918), and De Laguna (1916, 1918) praised the new movement. An enthusiastic Holt was all but prepared to do away with introspective methods. Dewey believed mind is best studied as it functions purposively to adjust organism to environment. De Laguna developed this functionalist outlook but she was unwilling to preclude introspection. But all agreed in seeing ‘behaviour as the expression of mind and no one was prepared to reject mentalistic descriptions of behaviour’. Holt and Dewey argued that ‘behaviour acts are unified as expressions of purpose. The behaviour of an animal that moves about and then eats when it finds food expresses the fact that the animal was looking for food’. Holt argued that such an ‘objective reference’ of behaviour is too often neglected. Such reference may be to things that do not exist, that existed only in the past, or that will exist in the future (Holt 1915 [1912]: 377–9).

The notions of purpose and objective reference in behaviour were developed by Perry (1918, 1921a and b). Perry approvingly saw behaviourism as a return to the Aristotelian view that ‘the body and mind are related as activity and organ’. According to the usual introspectivist, who adopts psychophysical parallelism, the mind simply ‘operates on’ physiological events; but for the behaviourist the mind ‘intercedes’ between stimulus and response (1921a, p. 83). Behaviourism closes the gap between mind and body. Perry did not rule out introspection, and he claimed the behaviourist did not either (citing De Laguna 1916). He believed that behavioural evidence enlarged the data of psychology and that the behaviourists would yield improved psychological explanations. Consider his discussion of psychological dispositions, whether ‘instincts’ or Freudian ‘complexes’. He regarded such dispositions as nonconscious and considered three types of explanation for them. They could be mental and not physiological, a possibility he found nonsensical for unchangeable states;
Neurotic's Principle. Skinner came to behaviourism through Russell 1927, his philosophical outlook being further shaped by Mach (1912 [1910]), Poincaré (1902), and the operantics of P. W. Bridgman (1927). Just when neo- 
behaviourism was coming to maturity, the logical empiricists alleged that all psychological statements can be translated into physical statements referring 
to physical states of a person's body (Carnap 1932, affirming epistemologi- 
cally-solidarity with American behaviourism; Carnap 1933; Hempel 1935). The neobehaviourists took note of the scientific philosophy of the Vienna Circle 
and its Berlin allies, but it was not formative or of influential on their positions 
(see Smith 1980).

Tolman studied psychology at Harvard, with instruction from Holz and Perry. He 
converted to behaviourism after going to Berkeley, where he spent his 
career, producing laboratory studies of maze-learning in rats, theoretical 
and methodological papers (collected in Tolman 1932a), and a major book (1932). 
He adopted an avowedly non-empirical, determination stance in metaphysics and 
epistemology (1921: ch. 25), and did not deny the existence of 'raw feels' or 
qua1 accessibility to individuals. From early on he characterised Watson's brand 
of behaviourism as a 'mucules' movement, directed at the 'mucules' movement 
of muscle contractions and glandular secretions. Tolman (1932: ch. 1) argued 
that even molecular behaviourism must rely on 'molar' descriptions of what 
animals do as wholes organisms interacting with their environments (something 
Wason had acknowledged in other terms, 1910: 13). Believing that effective 
in behaviour classification requires reference to the animal's purpose or end, 
Tolman advocated a 'purposive behaviourism' (with credit to Holt and Perry). 
He regarded the inherent teleology of behaviour as a biological and psy- 
chological fact. His work with rats in mazes, including their running into walls 
when a shortened path was substituted for a previously longer one, led him to 
attribute 'cognitive postulations', 'expectations', and 'representations' to rats 
(1926, 1927 [1932a: 60, 61].) These representations might be of objects that no 
longer exist, thereby exhibiting intentionality (see Amsden 1983). In response 
to Osgood psychology, Tolman came to attribute 'sign-Osgood expectations' to 
his animals, consisting of a sign-object perceived as standing in an means-end 
relation to a signified object or state of affairs. Inspired by Bridgman 1927, 
he developed the notion of 'intervening variables' as operationally defined inter- 
nals of animals (listed in Tolman 1938 [1951a]: as demand, appetite, sensory 
differentiation, motor skill, hyperactivity, and bias), which together with stimu- 
lation, heredity, maturity, personality, physiological training, combine to 
yield a response. For Tolman such intervening variables were realistically in- 
terpreted and not reducible to a purely physical or (positivist) observational 
language. Intervening variables are defined in relation to observable features of 

Behaviorism became the leading school of scientific psychology through the 
research and theorizing of the behaviourists, notably Tolman, Hull, and Skin- 
ner. None were simple stimulus-response reflexologists; all considered behaviour to be a function of a number of things, including current stimulation. 
All were methodologically reflective and philosophically engaged. Tolman and Hull were 
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they could be physiological and nonmental or, 'accepting the behaviouristic 
version of mind, one may regard dispositions as both physical and mental: phy- 
ological because consisting in certain physiological structures, mental because of 
the peculiar type of function or activity in which these structures are engaged' 
(1921: 94). Perry used the same notion of disposition to analyse purposive 
action, which he found to consist of a 'let' or 'determining tendency' to pur- 
pose a course of action in appropriate environmental circumstances, bringing 
in 'auxiliary responses' as needed to achieve the desired end. Such dispositions 
towards purposive action are linked conditionally to cognitive states such as be- 
liefs, which are 'suppositions' about environmental circumstances accredited to 
organisms in virtue of their dispositions to behave (1921b).

Bertrand Russell adopted the view that behaviour is an expression of mind in 
1921, a work that attempted to solve the mind-body problem through the 
neutral monism of James and the neo-philosophy of Holz and Perry, hence one 
that did not preclude introspection. He spoke approvingly of Watson's be- 
behaviourism throughout Russell 1927, though again retaining introspection as 
the means of knowing the ontologically neutral 'data' of both physics and psy- 
chology. Woodbridge (1921, 1922) argued that behaviour is inherently teleolog- 
ical and so must be understood in relation to ends. His position was consonant 
with earlier functionalism and with Perry's recent work. Psychological critics of 
behaviourism cited these and other philosophical discussions (see Roback 
1923: chs. 7-7). Such critics charged Watson with using a double standard in 
denying theoretical points to the mentalists while invoking unseen physiological 
states. They argued that 'behaviourist descriptions tacitly rely on the psycholog- 
ists' own introspective knowledge of events. Hull's account of learning 
would be shown factually inadequate, and questioned whether his talk of muscle 
switches and glandular secretions could effectively describe behaviour without 
Holz's notion of 'objective reference'. 

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Behaviorism and psychology
the animal's environment and behaviour, described (as he thought they must be) in the functionalist language of purpose. When MacCorquodale and Mead (1948) proposed that 'interessing variables' be viewed as merely empirical correlations and that 'hypothetical constructs' be used when internal entities or processes are posited, Tolman (1951b) explained that his intervening variables were hypothesised processes and states of the organism proper to psychology, not requiring physiological interpretation to be classed as hypothetical constructs (though he was merely tolerant of neuropsychological hypotheses, Tolman 1949). Although Tolman's self-classification as a behaviourist was questioned (Harrsett and Harrison 1938), it became widely accepted (Williams 1932; Woodworth 1928; O'Neil 1950). In the last two decades of his life, Tolman wrote many essays reviewing his own work on memory or mental activity objective, by substituting behavioural for introspective evidence. Hull and Skinner insisted on more austere vocabularies for describing such evidence than Tolman, though without returning to Watsonian twitchism. Unlike Tolman, Hull was an avowed materialist, adopting the working hypothesis that the organism can be wholly described within a 'physical or mechanical' view (1930; 1937 [1940: 450, 370]). He was not an eliminativist regarding conscious phenomena, but his vision of behavioural science excluded introspective methods. He allowed mentalistic language such as 'goal response' into his system, but unlike Tolman demanded it be rigorously defined in pure stimulus-response language containing no mentalistic terms (and no intentional notions).

Hull earned his PhD at Wisconsin in 1928 and taught there until moving to Yale in 1929. At first interested in hypnotic and mental testing, he converted to behaviourism while teaching it in seminars during the mid-1920s (using Wason 1940 and Boback 1923 as texts). He produced a series of important papers (collected in Hull 1944) and two major books (1934, 1952). He conceived the organism as a functionalist and Darwinian framework; he took Newtonian physics as his model of theory structure, with definitions, postulates, and theorems. He is best known for his highly formalised theory of learning or 'habit strength'. He identified himself as a 'molar' behaviourist, arguing that behaviour theory could proceed despite the lack of knowledge in neuropsychology, and granting behavioural science its own observational and theoretical vocabulary. At the same time, he treated intervening variables such as 'drive' (e.g., hunger) or 'need reduction' as referring to as-yet-unknown neural states. Hull was familiar with Carnap 1935, but did not interpret his theoretical apparatus using the analytic philosophy. He maintained that organisms behaved in the world and organized their experience through the framework of the Venn diagram. Later interpretations retroactively characterised his position in that light (e.g., Bergmann and Spence 1941; Feigl 1951; Koch 1954a; Spence 1942), thereby eliding his materialistic realism (see Aronson and Smith 1984).

Like Tolman and Hull, Skinner wanted to produce a science of behaviour together with an account (or 'philosophy') of that science. He absorbed Machian
behaviourism as narrow-mindedly denying plain facts of nature (Pepper 1932; Woodbridge 1925). Mind was to be integrated into nature, not excluded from it (Dewey 1922: ch. 6-8). This sort of naturalism was embraced by Tolman, but Hull and Skinner agreed only with its general biological orientation. Their neo-behaviourisms shaped the perception of American behaviourism in later decades, while Tolman came to be seen as a predecessor of the newer cognitive approaches.

After the 1940s the character of philosophical naturalism in America changed. The physicalism of some logical empiricists and Quine became prominent. Behaviourism was philosophically reinterpreted in physicalist terms. The biological bent of earlier American naturalism and the functionalism of neo-behaviourism were thereby masked. These developments conditioned retrospective interpretations of the philosophical context of behaviourism in the first half of the century, though these interpretations themselves belong to the history of philosophy after the middle of the century.

CHAPTER 13 BEHAVIOURISM AND PSYCHOLOGY


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