

Cognitivist or behaviourist – Who can tell the difference? The case of implicit and explicit knowledge

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Radical behaviourism has long defined mental or 'private' events as behaviour, and therefore legitimate objects of research. It is shown that to attack the complexities of human action, behaviour analysts have also had to postulate theories concerning the interaction of mental events and public behaviour, and so, in effect do cognitive psychology. It is argued that when researchers from the two schools of thought deal with similar problems, such as the relation between implicit and explicit knowledge, there are no fundamental differences between cognitive psychology and Skinnerian, or radical behaviourism.

Through the centuries, many thinkers have addressed the difference between two forms of human behaviour, one governed to a great extent by verbally formulated rules, maxims or hypotheses, the other shaped to a greater degree by non-verbal events that affect the organism, often resulting in knowledge that is hard to report verbally. Both Socrates (Dreyfus & Dreyfus, 1986; Plato, 4th century BC/1888) and Democritus (Lloyd, 1967; Vaughan, 1989) discussed this distinction, as have more recent thinkers (e.g. Ayer, 1956; Helmholtz, 1881/1968; Russell, 1912/1961). Since the beginning of this century, psychologists have performed empirical investigations bearing on the issue (Hayes, 1989; Judd, 1908; Luria, 1961; Stinessen, 1989; Thorndike & Rock, 1934). This work has, however, been performed at different times, and within different schools of thought, and has suffered from a lack of integration, like the philosophical writings in the field.

Conscious and unconscious knowledge has been given many names, such as 'linguistic formulations of knowledge' versus 'intuition' (Smolensky, 1988), 'declarative' versus 'procedural' knowledge (e.g. Lewicki, Hill & Bizot, 1988), or 'explicit' versus 'implicit' knowledge (e.g. Berry & Broadbent, 1988). Behaviour analysts think of knowledge as a form of behaviour, and tend to use the terms 'rule-governed' versus 'contingency-shaped' behaviour (Skinner, 1969).

There still is not agreement as to whether unconscious learning and knowledge exist at all (Overskeid, 1994*b*; Shanks & St John, 1994), and, if they do, how they should be referred to. Furthermore, communication between schools of thought is limited.

Nevertheless, development *has* taken place in this field of investigation, especially during the last 15 years, as cognitive psychologists have accepted that learning may

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take place unconsciously. During the same period, behaviour analysts have started to take Skinner's (1969) distinction between 'rule-governed' and 'contingency-shaped' behaviour seriously.

The relationship between cognitive and behaviour analytic researchers is interesting, not only because few authors outside these two schools of thought have investigated the problem of implicit/explicit knowledge experimentally, but also because behaviour analytic analyses of language-related phenomena such as rule-governed behaviour (Hayes, 1989) and equivalence classes (Dugdale & Lowe, 1990; Hayes, 1991; Sidman, 1990) occur in an area traditionally inhabited by cognitivists. What, then, is the relation between cognitive and behavioural research in our field of interest?

Skinner (1969, p. 156) states: 'Behavior which is exclusively shaped by... contingencies is perhaps the closest one can come to the "personal knowledge" of Polanyi and Bridgman', while Hunt, a researcher in the cognitive tradition, adds (1984, p. 597):

Skinner's distinction between rule-governed and contingency-governed behavior bears more than a superficial resemblance to the 1980s' distinction between controlled and automatic processing... Presumably a good deal of effort could have been saved if Skinner's paper [An operant analysis of problem solving, 1966] had been read more carefully by the information-processing psychologists.

There are probably few good reasons to search for unity, until researchers are investigating one and the same field without an optimal exchange of knowledge and views. Schnaitter (1987) asserts that with regard to behaviourist and cognitivist researchers, this is not the case: The object of behaviourism is to establish the relation between behaviour and the context of its occurrence, while the object of cognitivism is to establish the internal design through whose functioning organisms are capable of behaving in context. Catania (1992, p. 8), among others, has asserted that psychologists with a behavioural orientation tend 'to deal with questions of function, and the cognitivist with questions of structure'. Statements such as this have come under attack from Paniagua (1986), who claims they are misleading because 'structure' and 'function' do not mean the same to researchers in the cognitive and the behavioural tradition. In their textbook *Cognitive Psychology*, Medin & Ross (1992, p. 42) seem to illustrate Paniagua's point, by saying '... we are interested in models that illuminate cognitive *processes*' (italics in original).

Looking again at Schnaitter's (1987) criteria, we soon find that the distinctions between the stipulated tasks of behaviourism and cognitivism are blurred. Can any research in psychology be performed without investigating the relation between behaviour and the context of its occurrence? The object of cognitivism may be to establish the internal design through whose functioning organisms are capable of behaving in context, but then all that is left for behaviourists is to abstain from building theories of the internal design. As we shall see, Skinnerian behaviourism has not been able to resist that temptation.

Verbal control – or not?

Empirical findings regarding verbal control of behaviour have created trouble

among behaviourists and cognitivists alike, because subjects have had a tendency to behave in ways they should not, according to received views. In early operant experiments this was the case when findings showed that people did not quite behave as animals, because what the subjects said to themselves, or what other people told them, had an effect on their behaviour (Ader & Tatum, 1961; Weiner, 1962, 1964). Similarly, when cognitive researchers have discovered unconscious learning in humans – the learning of rules which are never verbalized – this has posed a problem, as it has been at odds with dominant cognitive assumptions of learning (Brewer, 1974; Medin & Ross, 1992; Shanks & Dickinson, 1991).

When cognitive researchers began to see the significance of learning without words, the lack of communication between behavioural and cognitive researchers was often very clearly illustrated. Reber, Allen & Regan (1985, p. 17) asserted that the 'cognitive unconscious' did not receive the attention it deserved, because it was 'the pariah of experimentalists who functioned under the constraints of radical behaviorism'. However, unlike the cognitivists, radical behaviourists do not have any quarrel with the unconscious, 'cognitive' or not. That is how things are supposed to be. It is conscious behaviour that presents problems.

The degree to which cognitive researchers have resisted, and to some extent still do, the view that learning without awareness can take place in humans (e.g. Brewer, 1974; Dulany, Carlson & Dewey, 1985; Shanks & St John, 1994) is surprising. Computer metaphors and models do not require the *machine* to be conscious. Of course, there is also a strong tradition in cognitive research, dating back to Ebbinghaus (Postman, 1968), that stresses conscious functioning in the study of learning and memory. Ebbinghaus' strong orientation towards biology should perhaps also have led his successors toward studying the kinds of learning that humans and animals have in common. But this has not happened; the idea that much human learning does indeed take place in the absence of consciousness seems well supported, however (Overskeid, 1994b; Reber, 1993; Svartdal, 1994).

Language and communication

Behaviour analysis evolved around the work of Skinner. In his 'interpretations' of human behaviour and culture (1953, 1957, 1969, 1987), Skinner felt free to form hypotheses on causal relations that had never been observed, based on scarce empirical material – sometimes by analogy with animal studies, frequently not even that. More than once, Skinner's hypothesizing touched cognitive phenomena, and it is often said that one of the things that makes radical behaviourism radical is its acceptance of thinking as behaviour (cf. Skinner, 1974).

In an historical account of the developments that led to the birth of modern cognitive psychology, Medin & Ross (1992, p. 26) cite as a main deficiency of behaviourism that 'Skinner's analysis also failed to take into account the role of the organism in organizing and theorizing about its experience. This neglect of internal processes mediating between stimulus and response eventually led experimental psychologists to move away from behaviorism'.

In their analysis of current trends in experimental psychology, Kleinginna & Kleinginna (1988) point to several issues of theory and methodology on which

behaviour analysts seem to be developing standpoints more compatible with non-behavioural approaches. They (1988, p. 375), state, however that [radical] 'behaviorists are not likely to compromise on core metatheoretical issues, like the use of intervening variables'. It can be argued, however, that radical behaviourists compromised with regard to the use of intervening variables quite some time ago. This is clearly evident in their interpretations of experimental evidence and everyday human behaviour (Hayes & Hayes, 1992; Hayes & Chase, 1991; Skinner, 1953, 1969). Often, the radical behaviourist argument is that: 'The behaviorist does not dispute the existence of ideas, feelings, and hunches, but rather criticizes their invocation as causes of behavior' (Catania, 1992, p. 7). Nevertheless, when Skinner (1969, p. 139) refers to a rule as something that can change behaviour when recalled, it is difficult to see this as something other than a description of how a cognitive process can have an effect on overt behaviour (cf. Overskeid, 1994a). Even more explicitly, both Skinner (1988) and Catania (1988) agree that private events may be called intermediate causes of behaviour – in other words intervening variables in the classical sense.

It is probably not controversial to state that the main concern of modern cognitivists is 'to develop an objective psychology of cognitive structures and processes, by basing its hypothetical constructs on directly observable events' (Kleinginna & Kleinginna, 1988, p. 382). If we replace 'cognitive structures and processes' with 'behaviour', we arrive at a description of what behaviour analysts do when they study the effect of covert verbal behaviour.

It can, in fact, be argued that Skinner sowed the seed of cognitivism in behaviour analysis by interpreting 'mental' events as behaviour (e.g. Skinner, 1974, cf. Schnaitter, 1984). Skinner's rhetoric and use of terminology disguised this, as did the fact that behaviour analysts have never explicitly addressed issues of cognition in empirical work – even if cognition has become, at least in principle, a legitimate field of research in the eyes of a number of behaviour analysts (Catania, 1992; Hayes & Hayes, 1992). Nonetheless, both Skinner and his followers have done little to explore theoretically the consequences of accepting mental phenomena as behaviour.

There are a limited number of ways of studying phenomena that cannot be observed directly. Most often there is nothing in cognitive ways of doing experiments that might exclude the results from a behavioural database, or vice versa – even if results may be interpreted differently. The work of researchers such as Reese (1989) and Svartdal (1992) show how fruitful an integration of behaviour analytic and cognitive theory and research can be when applied to the domain of implicit versus explicit knowledge – or contingency-shaped versus rule-governed behaviour. Furthermore, paradigmatic behaviourism (Staats, 1989, 1991) has for several decades been treating cognitive concepts in behavioural terms, and has also pointed out (Staats, 1989) how terminological confusion may conceal the similarity of psychological theories.

Behaviourism could only remain behaviourism as long as its subject matter was limited to what we normally call behaviour: 'what an organism is *doing*, or more accurately what it is observed by another organism to be doing' (Skinner, 1938, p. 6, italics in original). Skinner and Skinnerians have nevertheless built theories of cognitive phenomena and intervening variables within a tradition christened 'radical' behaviourism.

In conclusion, it seems fair to say that no fundamental difference, only different terminology, and prejudice, no doubt, stands between the unity of radical behaviourism and cognitive psychology. The differences that remain today lie in the willingness to speculate, and to make use of theoretical constructs.

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