Conditioning and Associative Learning

By N.J. Mackintosh

Clarendon Press, Oxford/ OUP, New York, 1983. £17.50 (316 pp.)

This is rightly regarded as the last word in learning theory but, as Mackintosh emphasizes on p. 2, learning theory of this particular kind 'no longer occupies the exalted position it once held among the various fields of psychology'. The theory applies most directly to rats and pigeons receiving signal–reinforcer pairings in Skinner boxes (conditioned emotional response procedures for rats; autoshaping for pigeons): in the preface Mackintosh notes that he has 'eschewed discussion' of anything directly concerned with schedules of reinforcement, and said little or nothing about naturalistic topics such as imprinting, song learning, navigation or intelligence in animal species. That is because the theoretical aim of the book is to establish certain laws of association which make up 'one possible view of the nature of conditioning'. One cannot do justice to this view briefly, but Mackintosh first adopts a version of two-factor theory, that is he accepts an operational and functional distinction between classical and instrumental conditioning (p. 41); then he advocates a stimulus-substitution theory of classical conditioning, in which a CS elicits responses by activating a representation of a UCS, but only according to its own sensory properties (pp. 68–70); puts forward a Tolmanian theory of instrumental conditioning, in which an animal must infer from previous associations between lever pressing and food that it might be a good idea to press the lever again (pp. 110–112); argues for the theoretical symmetry of reward and punishment (pp. 126–131); just about (I think) accepts the two-factor theory of avoidance learning (pp. 155–170); discusses various laws of association in terms of the adequacy or otherwise of the Rescorla–Wagner single-equation model (pp. 171–239); and in a final short chapter sets off the phenomena of discrimination learning as calling upon processes 'not normally studied in simple conditioning experiments' (p. 273) and 'outside the scope of standard theories of conditioning' (p. 271).

By comparison with his enormously successful *The Psychology of Animal Learning*, Mackintosh's present book is theoretically tighter and more succinct. The major theoretical change seems to me to be a slight firming up of the classical/instrumental distinction. Within the areas covered, Mackintosh is so encyclopaedically knowledgeable, and au fait with the merits and failings of all conceivable theoretical positions, as to be quite above criticism. One can only lament, for the purposes of this journal, that the learning theories of the present Cambridge school make so little contact with any kind of physiology—and with psychophysiology in particular. They are cerebral if not ethereal theories. Cambridge rats have recently become capable of translating their thoughts into action but seldom, in these pages, do they translate their thoughts into emotions. They do not pant, defecate or change their heart rate and therefore, within theories of associative learning, connections with psychophysiological measurement are not yet obvious, though that does not mean such connections are necessarily non-existent. Mackintosh's index contains entries for neither nervous system (central or autonomic), nor drive, motivation or stress. It is surely possible, at least in principle, to extend theories of this general type in the direction of flesh and blood. For instance, it would be interesting to bring data on ulceration and weight loss to bear on the issue of whether the concept of an aversive motivational state is really needed to explain how animals learn to avoid electric shocks, when these are not preceded by a special signal (p. 157).

Mackintosh might not agree that such physiological data would be relevant, since he puts forward a purely behavioural account of learning, both in principle and practice. Within this con-

straint, I have just one query. On p. 222 it is implied that a general law of association, which will 'underly any example of successful conditioning', is 'that there be a true causal relation between the events to be associated'. A great deal rests on what exactly is meant by 'a true causal relation' here. Truth and cause are going to be a difficulty anyway (they entail false causal and true non-causal relations between stimuli), but as the context here is taste-aversion learning, by which rats can very effectively be put off the taste of saccharin if this happens to precede whole body X-irradiation, I suspect that this could be a page on which Mackintosh might be caught out. However, it is undoubtedly a feature of this book that such pages, if any exist at all, are very rare indeed.

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@inproceedings{Mackintosh1983ConditioningAA, title={Conditioning and associative learning}, author={Nicholas J. Mackintosh}, year={1983} }. Nicholas J. Mackintosh. Published 1983.Â The study of conditioning in animals Classical and instrumental conditioning Theoretical analysis of classical conditioning Theoretical analysis of instrumental conditioning Appetitive and aversive reinforcement Avoidance learning Contiguity and contingency: excitatory and inhibitory conditioning Laws of association Discrimination learning References Indexes. Classical conditioning is one of two forms of associative learning, which basically means learning via associating two occurring events. The other form of associative learning is called â€œoperant conditioning,â€ which â€œfocuses on using either reinforcement or punishment to maximize or minimize a certain behavior.â€ iSpring Suite.Â Conditioned stimulus â€“ this is a neutral trigger that, when paired with an unconditioned stimulus, creates a conditioned response. So if we heard a bell every time we smelled food and thus triggered hunger, the sound of a bell would eventually become the trigger that would produce the conditioned response (i.e. hunger). Conditioned response â€“ Per the above example, the conditioned response would be hunger without the smell of food, upon hearing the bell.

Classical conditioning (also known as Pavlovian or respondent conditioning) refers to a learning procedure in which a biologically potent stimulus (e.g. food) is paired with a previously neutral stimulus (e.g. a bell). It also refers to the learning process that results from this pairing, through which the neutral stimulus comes to elicit a response (e.g. salivation) that is usually similar to the one elicited by the potent stimulus. It was first studied by Ivan Pavlov in 1897. Conditioning and Associative Learning. Br Med Bull. 1981 May;37(2):165-8. doi: 10.1093/oxfordjournals.bmb.a071695.Â Association Learning*. Attention. Conditioning, Classical. Conditioning, Operant. Conditioning, Psychological*. Discrimination Learning. Humans. Learning*. Reinforcement, Psychology. Classical conditioning is one of two forms of associative learning, which basically means learning via associating two occurring events. The other form of associative learning is called â€œoperant conditioning,â€ which â€œfocuses on using either reinforcement or punishment to maximize or minimize a certain behavior.â€ iSpring Suite.Â Conditioned stimulus â€“ this is a neutral trigger that, when paired with an unconditioned stimulus, creates a conditioned response. So if we heard a bell every time we smelled food and thus triggered hunger, the sound of a bell would eventually become the trigger that would produce the conditioned response (i.e. hunger). Conditioned response â€“ Per the above example, the conditioned response would be hunger without the smell of food, upon hearing the bell. Associative learning is a type of learning principle based on the assumption that ideas and experiences reinforce one another and can be linked. Abramson (1994) defines the concept as a form of behavior modification involving the association of two or more events, such as between two stimuli, or between a stimulus and a response. This type of learning falls not only under the scope of psychology but is of interest for neurologists as well.Â Psychologists have divided associative learning into two types: classical conditioning and operant conditioning. Classical conditioning is the formation of an association between a conditioned stimulus and a response.

Classical conditioning is a form of learning whereby a conditioned stimulus (CS) becomes associated with an unrelated unconditioned stimulus (US) in order to produce a behavioral response known as a conditioned response (CR). The conditioned response is the learned response to the previously neutral stimulus. The unconditioned stimulus is usually a biologically significant stimulus such as food or pain that elicits an unconditioned response (UR) from the start.Â Advertising executives, for example, are adept at applying the principles of associative learning. Think about the car commercials you have seen on television: many of them feature an attractive model. By associating the model with the car being advertised, you come to see the car as being desirable (Cialdini, 2008). Reader view. Associative. Learning. Memory. Learning is a relatively permanent change in an organism's behavior due to experience. What is memory? What is a psychological model?Â Organisms involuntary responses become associated with a particular stimulus. Organism learns to operate on the environment to produce a particular response. -More efficient neural pathways. Imitation Onset. Learning by observation begins early in life. Unfortunately, Banduraâ€™s studies show that antisocial models (family, neighborhood or TV) may have antisocial effects. Courtesy of Albert Bandura, Stanford University. Bandura's Bobo doll study (1961) indicated that individuals (children) learn through imitating others who receive rewards and punishments. In classical conditioning, the stimulus (S) triggers the response (R) of an organism. With the exposure of the organism to the stimulus, reflex results. Reflex is the involuntary behavior which comes from within.Â This means that without learning, a stimulus can elicit a reflex. Reflex is called the unconditioned response because as what we mentioned, it is involuntary and we do not need to learn it for the event to occur. The Neutral Stimulus (NS) is a stimulus that does not elicit the Unconditioned Response (UR). This means that when this stimulus is presented to the organism, it would not execute the same response he showed when it encountered US. US and NS are repeatedly paired and presented to the organism in conjunction.

Classical conditioning is a type of associative learning based on the association between a neutral stimulus with another that is significant for a person or an animal in order to generate a similar response. It is the process we have seen previously with Pavlovâ€™s dog. A representative experiment in classical conditioning is that of Little Albert.Â Associative learning in children has been and continues to be studied in depth. Teachers often use positive reinforcements such as putting star stickers on children who have behaved extraordinarily well. On the other hand, not reinforcing children who shout deliberately for attention or punish those who annoy their peers. The animals had learned to associate the sound with the food that followed. Pavlov had identified a fundamental associative learning process called classical conditioning. Classical conditioning refers to learning that occurs when a neutral stimulus (e.g., a tone) becomes associated with a stimulus (e.g., food) that naturally produces a behaviour. After the association is learned, the previously neutral stimulus is sufficient to produce the behaviour. As you can see in Figure 8.3, â€œ4-Panel Image of Whistle and Dog,â€ psychologists use specific terms to identify the stimuli and the responses in Associative learning refers to classic conditioning in which individuals learn an association between an unconditioned and conditioned stimulus to produce a conditioned response. From: Encyclopedia of the Neurological Sciences, 2003. Related termsÂ E. Fantino, S. Stolarz-Fantino, in Encyclopedia of Human Behavior (Second Edition), 2012. Challenge and limitations of the biological constraints position. The focus on biological constraints on associative learning has leveled two classes of criticism against traditional theories of reinforcement and of associative learning. The first criticism is that laboratory research on learning is artificial.