

Habituation & moral apathy

Description

"global warming"#saveyourinternet5G1984AabductionAcademic freedomadaptationaffective cognitive psychologyAgathologyagressionagro geneticsAIAIDSAldous HuxleyAlgoritmic Controlalpha wavesAltered states of consciousnessamerican psychological associationanalogy

Habituation is a form of non-associative learning in which an innate (non-reinforced) response to a stimulus decreases after repeated or prolonged presentations of that stimulus. Responses that habituate include those that involve the intact organism (e.g., full-body startle response) or those that involve only components of the organism (e.g., habituation of neurotransmitter release from in vitro Aplysia sensory neurons). The response-system learns to stop responding to a stimulus which is no longer biologically relevant. For example, organisms may habituate to repeated sudden loud noises when they learn these have no consequences. Habituation usually refers to a reduction in innate behaviours, rather than behaviours acquired during conditioning (in which case the process is termed “extinction”). A progressive decline of a behavior in a habituation procedure may also reflect nonspecific effects such as fatigue, which must be ruled out when the interest is in habituation as a learning process.

Further References

Dong, S., & Clayton, D. F.. (2009). Habituation in songbirds. Neurobiology of Learning and Memory, 92(2), 183–188.

Plain numerical DOI: 10.1016/j.nlm.2008.09.009
DOI URL
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“Songbirds respond to initial playback of a recorded conspecific song in numerous ways, from changes in gene expression in the brain to changes in overt physical activity. when the same song is presented repeatedly, responses have been observed to habituate at multiple levels: molecular, cellular and organismal. core criteria of habituation have been established at each level, although in no case have all the formal parameters been rigorously measured. at the level of overt behavior, classical field studies showed that territorial birds respond to the song of a potential challenger with a variety of behaviors, and many (but not all) of these behaviors decline with repeated stimulus presentation. more recent laboratory studies have defined analogous responses to song presentation in the zebra finch (taeniopygia guttata), the dominant species in current molecular and neurobiological research and one that does not use song for territorial defense. studies in the zebra finch have also demonstrated activation followed by habituation of responses measured at both electrophysiological and molecular (gene expression and signal transduction) levels. in all cases, habituation is specific for a very particular stimulus – an individual song presented in a particular context. there are strong correlations between habituation measurements made at these different levels, but some dissociations have also been observed, implying that molecular, electrophysiological and behavioral habituations are not equivalent manifestations of a single core process. © 2008 elsevier inc. all rights reserved.”
Coppola, G., Pierelli, F., & Schoenen, J.. (2009). Habituation and migraine. Neurobiology of Learning and Memory, 92(2), 249–259.

Plain numerical DOI: 10.1016/j.nlm.2008.07.006
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“The most reproducible and ubiquitous interictal abnormality of the migraineurs’ brain is lack of habituation in neuronal information processing. the underlying mechanisms are uncertain. increased neuronal excitability, decreased inhibition or decreased pre-activation levels have all been proposed as possible culprits. the present review summarizes the available data on habituation in migraine patients obtained with different methodological approaches. we will discuss the change of habituation level over the migraine cycle and we will show that these data congruently indicate that the sensory cortices of migraineurs react excessively to repetitive, but not to a small series of stimuli. although the precise cellular and molecular mechanisms of this hyper-responsivity must still be determined, we will describe experimental data suggesting that a dysrhythmic thalamo-cortical activity due to inadequate monoaminergic control might be a plausible explanation. © 2008 elsevier inc. all rights reserved.”
Schöner, G., & Thelen, E.. (2006). Using dynamic field theory to rethink infant habituation.. Psychological Review, 113(2), 273–299.

Plain numerical DOI: 10.1037/0033-295X.113.2.273
DOI URL
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“Much of what psychologists know about infant perception and cognition is based on habituation, but the process itself is still poorly understood. here the authors offer a dynamic field model of infant visual habituation, which simulates the known features of habituation, including familiarity and novelty effects, stimulus intensity effects, and age and individual differences. the model is based on a general class of dynamic (time-based) models that integrate environmental input in varying metric dimensions to reach a single decision. here the authors provide simulated visual input of varying strengths, distances, and durations to 2 coupled and interacting fields. the 1st represents the activation that drives ‘looking,’ and the 2nd, the inhibition that leads to ‘looking away,’ or habituation. by varying the parameters of the field, the authors simulate the time course of habituation trials and show how these dynamics can lead to different depths of habituation, which then determine how the system dishabituates. the authors use the model to simulate a set of influential experiments by r. baillargeon (1986, 1987a, 1987b) using the well-known ‘drawbridge’ paradigm. the dynamic field model provides a coherent explanation without invoking infant object knowledge. the authors show that small changes in model parameters can lead to qualitatively different outcomes. because in typical infant cognition experiments, critical parameters are unknown, effects attributed to conceptual knowledge may be explained by the dynamics of habituation.”
LEUSSIS, M., & BOLIVAR, V.. (2006). Habituation in rodents: A review of behavior, neurobiology, and genetics. Neuroscience & Biobehavioral Reviews, 30(7), 1045–1064.

Plain numerical DOI: 10.1016/j.neubiorev.2006.03.006
DOI URL
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“Habituation to a novel environment in rodents is commonly defined as a change in exploratory or locomotor activity over time (intrasession) or with repeated exposures (intersession). while numerous neuroactive substances are known to influence habituation, neurotransmitters that play particularly important roles are serotonin, acetylcholine, dopamine and glutamate. although habituation is a complex process, studies over the past two decades have demonstrated that there is a genetic component. at present, although researchers are still attempting to isolate key genes that control habituation, findings in mutant mice have begun to highlight some of the genes that could play a role. the challenge will be in deciphering what genes are directly involved in the process of habituation, what genes indirectly influence habituation through a secondary mechanism, and what genes have no role in habituation but are only affected as part of the downstream cascade. © 2006 elsevier ltd. all rights reserved.”
Thompson, R. F.. (2009). Habituation: A history. Neurobiology of Learning and Memory, 92(2), 127–134.

Plain numerical DOI: 10.1016/j.nlm.2008.07.011
DOI URL
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“Experimental studies, or at least observations of phenomena of habituation for a variety of responses in a wide range of organisms from amoebas to humans literally exploded at the end of the nine- teenth century and early twentieth century. see harris (1943) and jennings (1906). i was unable to determine who first used the term habituation in this context, but it was in widespread use early in the twentieth century. in his classic text on learning, humphrey (1933) notes that a range of terms, ‘‘acclimatization”, ‘‘accommo- dation”, ‘‘negative adaptation”, ‘‘fatigue” have been used to de- scribe the phenomenon. harris (1943) in his classic review adds the terms ‘‘extinction” and ‘‘stimulatory inactivation” to the list.”
Groves, P. M., & Thompson, R. F.. (1970). Habituation: A dual-process theory.. Psychological Review, 77(5), 419–450.

Plain numerical DOI: 10.1037/h0029810
DOI URL
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“Presented a dual-process theory of response plasticity to repeated stimulation. 2 hypothetical processes, 1 decremental (habituation) and 1 incremental (sensitization), are assumed to develop independently in the cns and interact to yield the final behavioral outcome. behavioral experiments are presented, using both the hindlimb flexion reflex of acute spinal cat and the acoustic startle response of intact rat, which are consistent with this theory. neurophysiological experiments indicate that the 2 processes have separate and distinct neuronal substrates. the dual-process theory and other current theories of response habituation are evaluated in terms of these and other recent findings. (6 p. ref.)”
Thompson, R. F., & Spencer, W. A.. (1966). Habituation: A model phenomenon for the study of neuronal substrates of behavior. Psychological Review

Plain numerical DOI: 10.1037/h0022681
DOI URL
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“The recent habituation literature is reviewed with emphasis on neuro- physiological studies. the hindlimb flexion reflex of the acute spinal cat is used as a model system for analysis of the neuronal mechanisms involved in habituation and sensitization (i.e., dishabituation). ha- bituation of this response is demonstrated to follow the same 9 parametric relations for stimulus and training variables characteristic of behavioral response habituation in the intact organism. habituation and sensitization appear to be central neural processes and probably do not involve presynaptic or postsynaptic inhibition. it is suggested that they may result from the interaction of neural processes resembling ‘polysynaptic low-frequency depression,’ and ‘facilitatory afterdis- charge.’ ‘membrane desensitization’ may play a role in long-lasting habituation.”
Rankin, C. H., Abrams, T., Barry, R. J., Bhatnagar, S., Clayton, D. F., Colombo, J., … Thompson, R. F. . (2009). Habituation revisited: An updated and revised description of the behavioral characteristics of habituation

. Neurobiology of Learning and Memory, 92(2), 135–138.

Plain numerical DOI: 10.1016/j.nlm.2008.09.012
DOI URL
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“The most commonly cited descriptions of the behavioral characteristics of habituation come from two papers published almost 40 years ago [groves, p. m., & thompson, r. f. (1970). habituation: a dual-process theory. psychological review, 77, 419-450; thompson, r. f., & spencer, w. a. (1966). habituation: a model phenomenon for the study of neuronal substrates of behavior. psychological review, 73, 16-43]. in august 2007, the authors of this review, who study habituation in a wide range of species and paradigms, met to discuss their work on habituation and to revisit and refine the characteristics of habituation. this review offers a re-evaluation of the characteristics of habituation in light of these discussions. we made substantial changes to only a few of the characteristics, usually to add new information and expand upon the description rather than to substantially alter the original point. one additional characteristic, relating to long-term habituation, was added. this article thus provides a modern summary of the characteristics defining habituation, and can serve as a convenient primer for those whose research involves stimulus repetition. © 2008 elsevier inc. all rights reserved.”

Category

1. General

Tags

1. adaptation
2. familiarity
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Date Created
April 2019
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