DOWNLOAD PDF HYPOTHESIS AND PERCEPTION

Chapter 1 : Perception - Wikipedia

As nouns the difference between hypothesis and perception is that hypothesis is (sciences) used loosely, a tentative conjecture explaining an observation, phenomenon or scientific problem that can be tested by further observation, investigation and/or experimentation as a scientific term of art, see the attached quotation compare to theory, and quotation given there while perception is.

Subjective constancy Perceptual constancy is the ability of perceptual systems to recognize the same object from widely varying sensory inputs. A coin looked at face-on makes a circular image on the retina, but when held at angle it makes an elliptical image. Without this correction process, an animal approaching from the distance would appear to gain in size. The brain compensates for this, so the speed of contact does not affect the perceived roughness. Principles of grouping Law of Closure. The human brain tends to perceive complete shapes even if those forms are incomplete. The principles of grouping or Gestalt laws of grouping are a set of principles in psychology , first proposed by Gestalt psychologists to explain how humans naturally perceive objects as organized patterns and objects. Gestalt psychologists argued that these principles exist because the mind has an innate disposition to perceive patterns in the stimulus based on certain rules. These principles are organized into six categories: The principle of proximity states that, all else being equal, perception tends to group stimuli that are close together as part of the same object, and stimuli that are far apart as two separate objects. The principle of similarity states that, all else being equal, perception lends itself to seeing stimuli that physically resemble each other as part of the same object, and stimuli that are different as part of a different object. This allows for people to distinguish between adjacent and overlapping objects based on their visual texture and resemblance. The principle of good continuation makes sense of stimuli that overlap: The principle of common fate groups stimuli together on the basis of their movement. When visual elements are seen moving in the same direction at the same rate, perception associates the movement as part of the same stimulus. This allows people to make out moving objects even when other details, such as color or outline, are obscured. The principle of good form refers to the tendency to group together forms of similar shape, pattern, color , etc. Contrast effect A common finding across many different kinds of perception is that the perceived qualities of an object can be affected by the qualities of context. If one object is extreme on some dimension, then neighboring objects are perceived as further away from that extreme. Perceptual learning With experience, organisms can learn to make finer perceptual distinctions, and learn new kinds of categorization. Wine-tasting, the reading of X-ray images and music appreciation are applications of this process in the human sphere. Specifically, these practices enable perception skills to switch from the external exteroceptive field towards a higher ability to focus on internal signals proprioception. Also, when asked to provide verticality judgments, highly self-transcendent yoga practitioners were significantly less influenced by a misleading visual context. Increasing self-transcendence may enable yoga practitioners to optimize verticality judgment tasks by relying more on internal vestibular and proprioceptive signals coming from their own body, rather than on exteroceptive, visual cues. Set psychology A perceptual set, also called perceptual expectancy or just set is a predisposition to perceive things in a certain way. Subjects who were told to expect words about animals read it as "seal", but others who were expecting boat-related words read it as "sail". They were told that either a number or a letter would flash on the screen to say whether they were going to taste an orange juice drink or an unpleasant-tasting health drink. In fact, an ambiguous figure was flashed on screen, which could either be read as the letter B or the number When the letters were associated with the pleasant task, subjects were more likely to perceive a letter B, and when letters were associated with the unpleasant task they tended to perceive a number People who are primed to think of someone as "warm" are more likely to perceive a variety of positive characteristics in them, than if the word "warm" is replaced by "cold". For example, people with an aggressive personality are quicker to correctly identify aggressive words or situations. It starts with very broad constraints and expectations for the state of the world, and as expectations are met, it makes more detailed predictions errors lead to new predictions, or learning processes. Clark says this research has various implications; not only can there be no completely "unbiased, unfiltered" perception,

but this means that there is a great deal of feedback between perception and expectation perceptual experiences often shape our beliefs, but those perceptions were based on existing beliefs [40]. Indeed, predictive coding provides an account where this type of feedback assists in stabilizing our inference-making process about the physical world, such as with perceptual constancy examples. Theories[edit] Perception as direct perception[edit] Cognitive theories of perception assume there is a poverty of stimulus. This with reference to perception is the claim that sensations are, by themselves, unable to provide a unique description of the world. A different type of theory is the perceptual ecology approach of James J. His theory "assumes the existence of stable, unbounded, and permanent stimulus-information in the ambient optic array. And it supposes that the visual system can explore and detect this information. The theory is information-based, not sensation-based. Animate actions require both perception and motion, and perception and movement can be described as "two sides of the same coin, the coin is action". Gibson works from the assumption that singular entities, which he calls "invariants", already exist in the real world and that all that the perception process does is to home in upon them. A view known as constructivism held by such philosophers as Ernst von Glasersfeld regards the continual adjustment of perception and action to the external input as precisely what constitutes the "entity", which is therefore far from being invariant. The invariant does not and need not represent an actuality, and Glasersfeld describes it as extremely unlikely that what is desired or feared by an organism will never suffer change as time goes on. This social constructionist theory thus allows for a needful evolutionary adjustment. Evolutionary psychology EP and perception[edit] Many philosophers, such as Jerry Fodor, write that the purpose of perception is knowledge, but evolutionary psychologists hold that its primary purpose is to guide action. Theories of perception[edit].

Chapter 2 : Linguistic relativity - Wikipedia

view of perception as an active process of hypothesis generation, this negative-effect-of-prior- experience phenomenon has important implications for theoretical conceptualizations of perception.

This is an open-access article distributed under the terms of the Creative Commons Attribution Non Commercial License , which permits non-commercial use, distribution, and reproduction in other forums, provided the original authors and source are credited. This article has been cited by other articles in PMC. Abstract Conscious perception and attention are difficult to study, partly because their relation to each other is not fully understood. Rather than conceiving and studying them in isolation from each other it may be useful to locate them in an independently motivated, general framework, from which a principled account of how they relate can then emerge. Accordingly, these mental phenomena are here reviewed through the prism of the increasingly influential predictive coding framework. On this framework, conscious perception can be seen as the upshot of prediction error minimization and attention as the optimization of precision expectations during such perceptual inference. This approach maps on well to a range of standard characteristics of conscious perception and attention, and can be used to interpret a range of empirical findings on their relation to each other. Here, the relation between attention and conscious perception is reviewed through the prism of predictive coding. This is the idea that the brain is essentially a sophisticated hypothesis tester Helmholtz, ; Gregory, , which continually and at multiple spatiotemporal scales seeks to minimize the error between its predictions of sensory input and the actual incoming input see Mumford, ; Friston, On this framework, attention and perception are two distinct, yet related aspects of the same fundamental prediction error minimization mechanism. The upshot of the review here is that together they determine which contents are selected for conscious presentation and which are not. This unifies a number of experimental findings and philosophical issues on attention and conscious perception, and puts them in a different light. The prediction error minimization framework transpires as an attractive, if yet still speculative, approach to attention and consciousness, and their relation to each other. Attention is difficult to study because it is multifaceted and intertwined with conscious perception. Thus, attention can be endogenous more indirect, top-down, or motivationally driven or exogenous bottom-up, attention grabbing ; it can be focal or global; it can be directed at objects, properties, or spatial or temporal regions, and so on Watzl, a , b. Attentional change often seems accompanied by a change in conscious perception such that what grabs attention is a new stimulus, and such that whatever is attended to also populates consciousness. It can therefore be difficult to ascertain whether an experimental manipulation intervenes cleanly on attention or whether it intervenes on consciousness too Van Boxtel et al. Consciousness is difficult to study, partly because of the intertwinement with attention and partly because it is multifaceted too. Consciousness can apply to an overall state e. There are widely accepted tools for identifying the neural correlates of conscious experience, though there is also some controversy about how cleanly they manipulate conscious states rather than a wide range of other cognitive processes Hohwy, In the background is the perennial, metaphysical mindâ€”body problem Chalmers, , which casts doubt on the possibility of ever achieving a fundamentally naturalist understanding of consciousness; we will not discuss any metaphysics in this paper, however. On the other hand, attention may bring unity too, via binding Treisman and Gelade, , and consciousness also has a selective role when ambiguities in the sensory input are resolved in favor of one rather than the other interpretation, as seems to happen in binocular rivalry. Attention and consciousness, then, are both difficult to define, to operationalize in functional terms, and to manipulate experimentally. Part of the trouble here has to do with the phenomena themselves, and possibly even their metaphysical underpinnings. But a large part of the trouble seems due to their intertwined relations. It is difficult to resolve these issues by appeal to commonsense or empirically informed conceptual analyses of each phenomenon in isolation of the other. For this reason it may be fruitful to appeal to a very general theoretical framework for overall brain function, such as the increasingly influential prediction error minimization approach, and review whether it implies coherently related phenomena with a reasonable fit to attention and conscious perception. The final section briefly offers some broader perspectives. Aspects of

Prediction Error Minimization Two things motivate the idea of the hypothesis testing brain: The brain needs to represent the world so we can act meaningfully on it, that is, it has to figure out what in the world causes its sensory input. Representation is thereby a matter of causal inference. Causal inference however is problematic since a manyâ€”many relation holds between cause and effect: Only with the precarious help of experience can the contingent links between them be revealed. This is the inverse problem, and it has a deep philosophical sting in the case of the brain. The brain never has independent access to both cause and effect because to have that it would already have had to solve the problem of representation. So it cannot learn from experience by just correlating occurrences of the two. It only has the effects to go by so must somehow begin the representational task de novo. The prediction error minimization approach resolves this problem in time. The basic idea, described heuristically here, is simple whereas the computational details are complex Friston, Sensory input is not just noise but has repeatable patterns. These patterns can give rise to expectations about subsequent input. The expectations can be compared to that subsequent input and the difference between them be measured. If there is a tight fit, then the pattern generating the expectation has captured a pattern in the real world reasonably well i. If the fit is less good, that is, if there is a sizeable prediction error, then the states and parameters of the hypothesis or model of the world generating the expectation should be revised so that subsequent expectations will, over time, get closer to the actual input. This idea can be summed up in the simple dictum that to resolve the inverse problem all that is needed is prediction error minimization. Expected statistical patterns are furnished by generative models of the world and instead of attempting the intractable task of inverting these models to extract causes from generated effects, prediction error minimization ensures that the model recapitulates the causal structure of the world and is implicitly inverted; providing a sufficient explanation for sensory input. This is consistent with a Bayesian scheme for belief revision in the light of new evidence, and indeed both Bayes as well as Laplace before he founded classical frequentist statistics developed their theories in response to the Humean-inspired inverse problem McGrayne, The idea is to weight credence in an existing model of the world by how tightly it fits the evidence i. The inverse problem is then resolved because, even though there is a manyâ€”many relation between causes in the world and sensory effects, some of the relations are weighted more than others in an optimally Bayesian way. The problem is solved de novo, without presupposing prior representational capability, because the system is supervised not by another agent, nor by itself, but by the very statistical regularities in the world it is trying to represent. This key idea is then embellished in a number of different ways, all of which have bearing on attention and conscious perception. Hierarchy The prediction error minimization mechanism sketched above is a general type of statistical building block that is repeated throughout levels of the cortical hierarchy such that there is recurrent message passing between levels Mumford, The input to the system from the senses is conceived as prediction error and what cannot be predicted at one level is passed on to the next. In general, low levels of the hierarchy predict basic sensory attributes and causal regularities at very fast, millisecond, time scales, and more complex regularities, at increasingly slower time scales, are dealt with at higher levels Friston, ; Kiebel et al. Prediction error is concurrently minimized across all levels of the hierarchy, and this unearths the states and parameters that represent the causal structure and depth of the world. Contextual probabilities Predictions at any level are subject to contextual modulation. This can be via lateral connectivity, that is, by predictions or hypotheses at the same hierarchical level, or it can be through higher level control parameters shaping low level predictions by taking slower time scale regularities into consideration. For example, the low level dynamics of birdsong is controlled by parameters from higher up pertaining to slower regularities about the size and strength of the bird doing the singing Kiebel et al. Similarly, it may be that the role of gist perception is to provide contextual clues for fast classification of objects in a scene Kveraga et al. The entire cortical hierarchy thus recapitulates the causal structure of the world, and the bigger the hierarchy the deeper the represented causal structure. Empirical Bayes For any appeal to Bayes, the question arises where do the priors come from Kersten et al. One scheme for answering this, and evading charges of excessive subjectivity, is empirical Bayes where priors are extracted from hierarchical statistical learning see, e. In the predictive coding scheme this does not mean going beyond Bayes to frequentism. Empirical Priors are sourced from higher levels in the hierarchy, assuming they are learned in an optimally Bayesian fashion Friston, The notion of

hierarchical inference is crucial here, and enables the brain to optimize its prior beliefs on a moment to moment basis. Free energy In its most general formulation, prediction error minimization is a special case of free energy minimization, where free energy the sum of squared prediction error is a bound on information theoretical surprise Friston and Stephan, The free energy formulation is important because it enables expansion of the ideas discussed above to a number of different areas Friston, Here, it is mainly the relation to prediction error minimization that will be of concern. Minimizing free energy minimizes prediction error and implicitly surprise. The idea here is that the organism cannot directly minimize surprise. This is because there is an infinite number of ways in which the organism could seek to minimize surprise and it would be impossibly expensive to try them out. Instead, the organism can test predictions against the input from the world and adjust its predictions until errors are suppressed. Even if the organism does not know what will surprise it, it can minimize the divergence between its expectations and the actual inputs encountered. A frequent objection to the framework is that prediction error and free energy more generally can be minimized by committing suicide since nothing surprises a dead organism. The response is that the moment an organism dies it experiences a massive increase in free energy, as it decomposes and is unable to predict anything there is more to say on this issue, see Friston et al. Active inference A system without agency cannot minimize surprise but only optimize its models of the world by revising those models to create a tight free energy bound on surprise. Agency, in this framework, is a matter of selectively sampling the world to ensure prediction error minimization across all levels of the cortical prediction hierarchy Friston et al. To take a toy example: Depending on the depth of the represented causal hierarchy this can give rise to very structured behavior e. There is an intuitive seesaw dynamic here between minimizing the bound and actively sampling the world. It would be difficult to predict efficiently what kind of sampling would minimize surprise if the starting point was a very poor, inaccurate, bound on surprise. Similarly, insofar as selective sampling never perfectly minimizes surprise, new aspects of the world are revealed, which should lead to revisiting the bound on surprise. It thus pays for the system to maintain both perceptual and active inference. Top-down and bottom-up This framework comes with a re-conceptualization of the functional roles of the bottom-up driving signal from the senses, and the top-down or backward modulatory signal from higher levels. The bottom-up signal is not sensory information per se but instead just prediction error. The backward signal embodies the causal model of the world and the bottom-up prediction error is then essentially the supervisory feedback on the model Friston, It is in this way the sensory input ensures the system is supervised, not by someone else nor by itself, but by the statistical regularities of the world. The upshot is an elegant framework, which is primarily motivated by principled, philosophical and computational concerns about representation and causal inference. It is embellished in a number of ways that capture many aspects of sensory processing such as context-dependence, the role of prior expectations, the way perceptual states comprise sensory attributes at different spatiotemporal resolutions, and even agency. We shall appeal to all these elements as predictive coding is applied to attention and conscious perception. Prediction Error and Precision As discussed above, there are two related ways that prediction error can be minimized: Both ways enable the model to have what we shall here call accuracy: So far, this story leaves out a crucial aspect of perceptual inference concerning variability of the prediction error. Prediction error minimization of the two types just mentioned assumes noise to be constant, and the variability of all prediction errors therefore the same. This assumption does not actually hold as noise or uncertainty is state dependent. Prediction error that is unreliable due to varying levels of noise in the states of the world is not a learning signal that will facilitate confident veridical revision of generative models or make it likely that selective sampling of the world is efficient. Prediction error minimization must therefore take variability in prediction error messaging into consideration â€” it needs to assess the precision of the prediction error. Predictions are tested in sensory sampling: If the actual distribution is different from the expected distribution, then a prediction error is generated.

Chapter 3 : Editions of Hypothesis and Perception by Errol E. Harris

Second, there is the hypothesis of direct perception (HDP), which proposes that perceptual experience primarily is a process of directly revealing or disclosing the meaning of the perceived (Gallagher, a; Zahavi,). There are two complementary aspects to the HDP.

Leavens Find articles by David A. Received Nov 21; Accepted Jan The use, distribution or reproduction in other forums is permitted, provided the original author s or licensor are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms. This article has been cited by other articles in PMC. Abstract We argue that imitation is a learning response to unintelligible actions, especially to social conventions. Various strands of evidence are converging on this conclusion, but further progress has been hampered by an outdated theory of perceptual experience. However, a growing consensus in social cognition research accepts the direct perception hypothesis: Indeed, physical details are overlooked â€" unless the action is unintelligible. Conversely, children copy means more often than adults and apes because, uniquely, much adult human behavior is completely unintelligible to unenculturated observers due to the pervasiveness of arbitrary social conventions, as exemplified by customs, rituals, and languages. Not too long ago most primatologists believed that non-human primates, including our closest relatives the chimpanzees, lacked the capacity of understanding conspecifics as other intentional agents like themselves Tomasello, But more recent experimental designs are revealing more of the actual extent of their social understanding Call and Tomasello, These discoveries have stimulated an ongoing discussion about which theories can account for these new developmental and comparative data Hutto et al. Following Gallagher, we agree that they best fit with recent theoretical developments in social cognition research that is focused on active perception, embodied cognition, and phenomenology Gallagher and Povinelli, We contribute to these changes by critically evaluating current theories of imitation in comparative psychology. Imitation is one type of social learning in which both the form and goal of a modeled action is acquired by an agent from another social being e. Examples of social learning are widespread among animals: There are a number of ways in which one organism can influence the probability of another organism displaying a response. One animal, for example, might be foraging in a particular location, which draws the attention of another animal to that location local enhancement. The mere presence of a conspecific might trigger certain responses; for instance, the probability of re-caching food by scrub jays and ravens increases in the presence of a conspecific observer Emery and Clayton, ; Bugnyar and Heinrich, Although imitation has been explored in a wide variety of animal species, including dogs e. But research into imitation has so far failed to directly relate such differences in the intelligibility of actions to qualitative differences in the experience of observing them. Instead, it is claimed that all actions are equally perceived as nothing but physical motions, thus requiring mentalistic inferences about their intentions, with some actions being more cognitively opaque than others Csibra and Gergely, But this is starting to change on the basis of recent findings in comparative and developmental psychology. Surprisingly, it was found that children frequently imitate instrumental actions even if they are clearly causally unnecessary to achieve the goal of the demonstrator, thus exhibiting so-called over-copying Whiten et al. For example, one 3-year-old child twisted a non-functional pin times after seeing a demonstrator twist the same pin only 16 times, in a study by Whiten et al. Over-imitation has been consistently documented for children, but not for young and older chimpanzees Nagell et al. However, there is a growing consensus that over-imitation is actually a rational learning strategy of a specific class of behaviors. While attempts to relate this phenomenon to causal learning of complex tool-use persist Lyons et al. They protest if others fail to over-imitate Keupp et al. Nevertheless, we argue that this continuing focus on causal learning of cultural artifacts is a bias derived from our own modern science- and technology-saturated cultural environment. Even unfamiliar instrumental actions can largely be understood in a contextually constrained manner due to the causal necessity of using certain actions to achieve some goal, given the circumstances. Unfamiliar symbolic actions, on the other hand, tend to be utterly opaque because their underlying means are not determined by causal necessity, but by historically

contingent social norms. To be sure, advanced technologies can reach similar levels of opacity, but when such techniques first developed in the Middle Stone Age, for example the manufacture of compound adhesives, the prerequisites of symbolic cognition were likely already in place Wadley, It is therefore possible that it was an increase in social norms in early hominid societies, which first necessitated an improved capacity for faithful imitation, while the improved transmission of advanced instrumental techniques was a beneficial side-effect. We will return to the question of the origins of human imitation at the end of this article. The crucial qualitative differences between perceiving contextually constrained and conventionally constrained actions have long been ignored because, as we will argue in more detail below, the theory of perception standardly employed in comparative psychology is misguided. Phenomenologists, on the other hand, have begun to remind scientists that the intentions of most observed actions, including instrumental actions, are directly perceivable by others â€" without the necessity of having to overcome any kind of opacity by engaging in mentalistic or behaviorist inference Gallagher and Povinelli, This basic phenomenological insight, supported by a variety of psychological evidence that is reviewed further below, has important theoretical consequences for comparative psychology. However, although others can provide guidance, this help is not required for one-shot learning of norms. Children will interpret one unnecessary action as conventionally constrained as long as it is performed intentionally Schmidt et al. They are directly perceived as intentional actions, yet are simultaneously seen as causally unnecessary and unintelligible. Lack of perceived meaning therefore makes the underlying physical means more salient. Of course, not every intentional action that a child perceives to be non-sense in this way is an unfamiliar norm-governed action, so there will be false positives, especially in artificial experimental situations â€" precisely what has become known as over-imitation. The phenomenological claim that this unintelligibility is manifested as a perceptual opacity, rather than as a cognitive opacity Gergely and Csibra, , is supported by a variety of evidence, including the fact that rational imitation can be affected by modulating the perceptual salience of the observed action Beisert et al. This and related evidence is discussed in more detail further below. We suggest that this general inverse correlation is found across primates, but that humans have become adapted to take advantage of it in the service of more effective enculturation during their development. There are at least two important developments. First, there is the hypothesis of embodied cognition HEC , which proposes that cognition is primarily embodied and interactive, such that real-time bodily interactions between two or more people can be partially constitutive of some social cognitive processes see, e. Second, there is the hypothesis of direct perception HDP , which proposes that perceptual experience primarily is a process of directly revealing or disclosing the meaning of the perceived Gallagher, a ; Zahavi, There are two complementary aspects to the HDP. On the one hand, the HDP implies that when we perceive a part of our physical environment, we directly perceive the meaning it has for us. On the other hand, the HDP makes a specific claim about how we perceive other people, namely as other agents with mental lives like ourselves. Their bodily presence is encountered as an affordance for social interaction Krueger, Moreover, biologically constrained bodily expressions, contextually constrained tool-use, and familiar conventionally constrained practices are directly perceived as intentional and goal-directed. If the HEC is correct that aspects of social cognition can sometimes be directly realized in embodied social interaction with others, and more generally that cognition can be directly constituted by our embodied comportment in the world, then the HDP becomes less mysterious. The mental lives of others are perceptually accessible because their minds are not hidden inside their brains but embodied and realized in their actions. This is especially true of basic emotions Stout, , but it can also hold for aspects of the classic belief-desire psychology e. First, we critically examine the theory of perception that has traditionally informed comparative and developmental psychology and show that its logical consequences do not easily fit with the empirical findings of current imitation research. Then we briefly review evidence from phenomenology and psychology to independently motivate the acceptance of a more adequate theory of perception, specifically the HDP. We then argue that the logical consequences of this hypothesis fit better with what is generally known about imitation, and apply the hypothesis to clarify central issues in the debate about the development and evolution of imitation. Perception is a form of information processing that converts external physical stimuli into internal mental representations a transductive process to be used by the cognitive system for reasoning about

the current state of the world and hence what to do next. According to this view â€"we will call it the hypothesis of physical perception HPP â€" cognition is entirely contained within the transductive envelope of perception, and perception primarily provides agents with a detailed set of facts about the external environment as it is conceived of by classical physics e. If the HPP is taken as the theoretical starting point we end up with the following logical deduction about social cognition Froese et al. The starting premise of this deduction, HPP- 1 , is typically phrased in the literature in terms of the metaphorical contrast between a surface and its hidden content. Since it is assumed from the beginning that perception cannot do this job HPP-2 , but there is evidence of social understanding in chimpanzees, it is necessary to postulate another cognitive process HPP A similar process of reasoning is often applied to the social understanding of human children and adults. We find explicit claims to this effect by leading experts throughout the whole history of the cognitive sciences. In saying that an individual has a theory of mind, we mean that the individual imputes mental states to himself and to others either to conspecifics or to other species as well. A system of inferences of this kind is properly viewed as a theory, first, because such states are not directly observable, and second, because the system can be used to make predictions, specifically about the behavior of other organisms. Premack and Woodruff, , p. Meltzoff, , p. This classic dualism between bodily behaviors and mental states continues to inflect and bias the debate in comparative psychology Racine and Carpendale, For example, Call and Tomasello , p. The possibility that social understanding is a direct perceptual achievement in most normal situations is thereby excluded by definition. This limited view of perceptual experience has important implications for how researchers in developmental and comparative psychology approach the phenomenon of imitation. We can deduce a couple of predictions about what would happen when an agent, who is operating according to the principles of the HPP, intends to replicate the observed behavior of another agent. The ways in which the replication of an observed behavior is guided with or without goal understanding and performed copying means or ends have been differentiated in the literature. It was initially proposed that emulation lacks goal understanding, since the replication of the results could be based on the observed results alone Tomasello et al. But evidence demonstrating that month-old children re-enact and complete the goals of incomplete or failed actions suggests they employ goal emulation Meltzoff, , as does evidence that months-olds and enculturated chimpanzees emulate more often when the reasons for the movements are clear to them Gergely et al. Thus, both the replication of means and ends may involve and not involve goal understanding. According to the HPP, the physical means and the physical outcomes of an observed action are both given in perceptual experience, thus seemingly making imitation easy. On the other hand, the means used to emulate an observed result are by definition different from the means of the perceived action otherwise it would be imitation , thereby requiring a creative response so as to avoid imitation. Accordingly, it seems that the received theory, which holds that imitation is comparatively rarer because it is more complex than emulation, is problematic Call and Carpenter, Indeed, following the logic of the HPP, we end up with precisely the opposite conclusion, namely that exact copying of means is less complex and should therefore be the more common form of replication. Mimicry of observed actions is always possible without additional physical or social cognition i. The HPP-based theories thereby arrive at a puzzling prediction: This is an odd prediction because extensive research in comparative psychology tells us that precisely the opposite should be the case. Faithful imitation is a much less common skill than emulation â€" some have even argued that it is limited to humans Tomasello, But if imitation is so simple, why do non-human primates not simply copy what they perceive? The received view has formulated two responses. Two decades ago it was still widely accepted that chimpanzees imitate less than humans because they lack the required social cognitive processes. This initial theory had to be revised after experimental evidence showed that apes understand that others have goals and behave toward them according to what they perceive. In particular, there is evidence for rational imitation in enculturated chimpanzees, i. All of this undermines the original hypothesis that the propensity to imitate is positively correlated with an understanding of other minds. Indeed, this should not come as a surprise since even adult humans â€" presumably having the most sophisticated social skills of all animals â€" imitate significantly less than human infants Horowitz, It therefore seems that other factors must be in play. This leads us to the second response to this dilemma, which accepts that non-human primates have intentional

understanding and that imitation should be more common among non-human primates. Bodily mirroring can also be an emergent outcome of the coordination dynamics of social interaction Froese et al.

Chapter 4 : Visual Perception | Simply Psychology

In a society where a comic equates with knockabout amusment for children, the sudden pre-eminence of adult comics, on everything from political satire to erotic fantasy, has predictably attracted an enormous amount of calendrierdelascience.com comics are part of the cultural landscape in a way that would have been unimaginable a decade ago.

Linguistic determinism The strongest form of the theory is linguistic determinism, which holds that language entirely determines the range of cognitive processes. The hypothesis of linguistic determinism is now generally agreed to be false. Research on weaker forms has produced positive empirical evidence for a relationship. Plato argued against sophist thinkers such as Gorgias of Leontini , who held that the physical world cannot be experienced except through language; this made the question of truth dependent on aesthetic preferences or functional consequences. Plato held instead that the world consisted of eternal ideas and that language should reflect these ideas as accurately as possible. Augustine , for example, held the view that language was merely labels applied to already existing concepts. This view remained prevalent throughout the Middle Ages. For Immanuel Kant , language was but one of several tools used by humans to experience the world. German Romantic philosophers[edit] In the late 18th and early 19th centuries, the idea of the existence of different national characters, or "Volksgeister", of different ethnic groups was the moving force behind the German romantics school and the beginning ideologies of ethnic nationalism. As early as , he alludes to something along the lines of linguistic relativity in commenting on a passage in the table of nations in the book of Genesis: This is because there is a correspondence of the language with the intellectual part of man, or with his thought, like that of an effect with its cause. There is a common genius prevailing among those who are subject to one king, and who consequently are under one constitutional law. Germany is divided into more governments than the neighboring kingdoms However, a common genius prevails everywhere among people speaking the same language. The lineaments of their language will thus correspond to the direction of their mentality. Von Humboldt argued that languages with an inflectional morphological type , such as German, English and the other Indo-European languages , were the most perfect languages and that accordingly this explained the dominance of their speakers over the speakers of less perfect languages. Wilhelm von Humboldt declared in The diversity of languages is not a diversity of signs and sounds but a diversity of views of the world. American linguist William Dwight Whitney , for example, actively strove to eradicate Native American languages , arguing that their speakers were savages and would be better off learning English and adopting a "civilized" way of life. Boas stressed the equal worth of all cultures and languages, that there was no such thing as a primitive language and that all languages were capable of expressing the same content, albeit by widely differing means. Boas saw language as an inseparable part of culture and he was among the first to require of ethnographers to learn the native language of the culture under study and to document verbal culture such as myths and legends in the original language. It does not seem likely [He espoused the viewpoint that because of the differences in the grammatical systems of languages no two languages were similar enough to allow for perfect cross-translation. Sapir also thought because language represented reality differently, it followed that the speakers of different languages would perceive reality differently. No two languages are ever sufficiently similar to be considered as representing the same social reality. The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached. It is easy to show that language and culture are not intrinsically associated. Totally unrelated languages share in one culture; closely related languagesâ€”even a single languageâ€”belong to distinct culture spheres. There are many excellent examples in Aboriginal America. The Athabaskan languages form as clearly unified, as structurally specialized, a group as any that I know of. The speakers of these languages belong to four distinct culture areas The cultural adaptability of the Athabaskan-speaking peoples is in the strangest contrast to the inaccessibility to foreign influences of the languages themselves. A common language cannot indefinitely set the seal on a common culture when the geographical, physical, and economics determinants of the culture are no longer the same throughout the area. Drawing on influences such

as Humboldt and Friedrich Nietzsche , some European thinkers developed ideas similar to those of Sapir and Whorf, generally working in isolation from each other. Benjamin Lee Whorf[edit] Main article: Benjamin Lee Whorf More than any linguist, Benjamin Lee Whorf has become associated with what he called the "linguistic relativity principle". Whorf also examined how a scientific account of the world differed from a religious account, which led him to study the original languages of religious scripture and to write several anti-evolutionist pamphlets. Although Whorf lacked an advanced degree in linguistics, his reputation reflects his acquired competence. We dissect nature along lines laid down by our native language. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscope flux of impressions which has to be organized by our mindsâ€”and this means largely by the linguistic systems of our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this wayâ€”an agreement that holds throughout our speech community and is codified in the patterns of our language [These examples of polysemy served the double purpose of showing that indigenous languages sometimes made more fine grained semantic distinctions than European languages and that direct translation between two languages, even of seemingly basic concepts such as snow or water, is not always possible. He further noticed that while no employees smoked cigarettes in the room for full barrels, no-one minded smoking in the room with empty barrels, although this was potentially much more dangerous because of the highly flammable vapors still in the barrels. He concluded that the use of the word empty in connection to the barrels had led the workers to unconsciously regard them as harmless, although consciously they were probably aware of the risk of explosion. This example was later criticized by Lenneberg [34] as not actually demonstrating causality between the use of the word empty and the action of smoking, but instead was an example of circular reasoning. Pinker in The Language Instinct ridiculed this example, claiming that this was a failing of human insight rather than language. He proposed that this view of time was fundamental to Hopi culture and explained certain Hopi behavioral patterns. Malotki used evidence from archaeological data, calendars, historical documents, modern speech and concluded that there was no evidence that Hopi conceptualize time in the way Whorf suggested. However Whorf was concerned with how the habitual use of language influences habitual behavior, rather than translatability. With Brown, Lenneberg proposed that proving such a connection required directly matching linguistic phenomena with behavior. They assessed linguistic relativity experimentally and published their findings in Since neither Sapir nor Whorf had ever stated a formal hypothesis, Brown and Lenneberg formulated their own. Their two tenets were i "the world is differently experienced and conceived in different linguistic communities" and ii "language causes a particular cognitive structure". Structural differences between language systems will, in general, be paralleled by nonlinguistic cognitive differences, of an unspecified sort, in the native speakers of the language. Since Brown and Lenneberg believed that the objective reality denoted by language was the same for speakers of all languages, they decided to test how different languages codified the same message differently and whether differences in codification could be proven to affect behavior. They designed experiments involving the codification of colors. In their first experiment, they investigated whether it was easier for speakers of English to remember color shades for which they had a specific name than to remember colors that were not as easily definable by words. This allowed them to compare the linguistic categorization directly to a non-linguistic task. In a later experiment, speakers of two languages that categorize colors differently English and Zuni were asked to recognize colors. In this way, it could be determined whether the differing color categories of the two speakers would determine their ability to recognize nuances within color categories. Universalism and Universalism and relativism of color terminology Lenneberg was also one of the first cognitive scientists to begin development of the Universalist theory of language that was formulated by Chomsky in the form of Universal Grammar , effectively arguing that all languages share the same underlying structure. This theory became the dominant paradigm in American linguistics from the s through the s, while linguistic relativity became the object of ridicule. They studied color terminology formation and showed clear universal trends in color naming. For example, they found that even though languages have different color terminologies, they generally recognize certain hues as more focal than others. They showed that in languages with few color

terms, it is predictable from the number of terms which hues are chosen as focal colors, for example, languages with only three color terms always have the focal colors black, white and red. For example, Pinker argues in The Language Instinct that thought is independent of language, that language is itself meaningless in any fundamental way to human thought, and that human beings do not even think in "natural" language, i. But to restrict thinking to the patterns merely of English [â€¦] is to lose a power of thought which, once lost, can never be regained. Cognitive linguistics[edit] In the late s and early s, advances in cognitive psychology and cognitive linguistics renewed interest in the Sapirâ€"Whorf hypothesis. He argued that language is often used metaphorically and that languages use different cultural metaphors that reveal something about how speakers of that language think. For example, English employs conceptual metaphors likening time with money, so that time can be saved and spent and invested, whereas other languages do not talk about time in that way. Other such metaphors are common to many languages because they are based on general human experience, for example, metaphors likening up with good and bad with down. Lakoff also argued that metaphor plays an important part in political debates such as the "right to life" or the "right to choose"; or "illegal aliens" or "undocumented workers". Parameters[edit] In his book Women, Fire and Dangerous things: He concluded that the debate had been confused. He described four parameters on which researchers differed in their opinions about what constitutes linguistic relativity: The degree and depth of linguistic relativity. Perhaps a few examples of superficial differences in language and associated behavior are enough to demonstrate the existence of linguistic relativity. Alternatively, perhaps only deep differences that permeate the linguistic and cultural system suffice. Rethinking Linguistic Relativity[edit] The publication of the anthology Rethinking Linguistic Relativity edited by Gumperz and Levinson began a new period of linguistic relativity studies that focused on cognitive and social aspects. The book included studies on the linguistic relativity and universalist traditions. Levinson documented significant linguistic relativity effects in the linguistic conceptualization of spatial categories between languages. Separate studies by Bowerman and Slobin treated the role of language in cognitive processes. Bowerman showed that certain cognitive processes did not use language to any significant extent and therefore could not be subject to linguistic relativity. Slobin described another kind of cognitive process that he named "thinking for speaking" â€" the kind of process in which perceptional data and other kinds of prelinguistic cognition are translated into linguistic terms for communication. These, Slobin argues, are the kinds of cognitive process that are at the root of linguistic relativity. Refinements[edit] Researchers such as Boroditsky , Lucy and Levinson believe that language influences thought in more limited ways than the broadest early claims. Researchers examine the interface between thought or cognition , language and culture and describe the relevant influences. They use experimental data to back up their conclusions. Psycholinguistic studies explored motion perception, emotion perception, object representation and memory. Recent work with bilingual speakers attempts to distinguish the effects of language from those of culture on bilingual cognition including perceptions of time, space, motion, colors and emotion.

Chapter 5 : Attention and Conscious Perception in the Hypothesis Testing Brain

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Badhesha Spring It is often thought that the reality expressed in spoken word is the very same as the reality which is perceived in thought. Perception and expression are frequently understood to be synonymous and it is assumed that our speech is based on our thoughts. This idea presumes that what one says is dependant of how it is encoded and decoded in the mind. However, there are many that believe the opposite: To the followers of this idea, thought is dependant on language. Linguist Edward Sapir and his student Benjamin Lee Whorf are known for their part in the popularization of this very principle. Their collective theory, know as the Sapir-Whorf Hypothesis or more commonly the Theory of Linguistic Relativity, holds great significance in the scope of all communication theory. The theory also fulfills the criteria, which essentially determine its workability. The Theory of Linguistic Relativity holds that: More basically, it states that thought is cast from language-what you see is based on what you say. The Sapir-Whorf Hypothesis can be divided into two basic components: Linguistic Determinism and Linguistic Relativity. The first part, linguistic determinism, refers to the concept that what is said, has only some effect on how concepts are recognized by the mind. Strong determinism refers to a strict view that what is said is directly responsible for what is seen by the mind. In an experiment done by two Australian scientists, Peterson and Siegal, this view of determinism is shown to be supported. In the experiment, deaf children view a doll, which is placed a marble in a box. The children then see the marble removed and placed in a basket after the doll is taken away. They are later asked where they believe the doll will look for the marble upon returning. Overwhelmingly, the deaf children with deaf parents answer correctly that the doll will look in the box. The deaf children with non-deaf parents answer mostly incorrectly. The experiment showed clearly the relationship between deaf children whose parents have communicated with them through complex sign language and their being able to get the correct answer. The children, having grown up in an environment with complex language American Sign Language recognized that the doll would probably look to where she had placed the marble. The other children, who had not grown up in a stable linguistic environment their parents not being hearing impaired and thus not being fluent in ASL were not able to see the relationship. These results lead the experimenter John R. Skoyles to believe that the Sapir-Wharf Hypothesis was correct according to strong determinism Current Interpretationâ€¦, p. The second division of the Sapir-Whorf Hypothesis is linguistic relativism. This part of the hypothesis can be defined: As stated by Sapir himself: This view of cognition can be more simply defined as meaning: Linguistic relativity opens the window to the realization that all languages do not translate to each other. This brings to mind that notion that language is relative, thus the same word can have different meanings for different people and these subjective meanings let rise varying cognitions. Indeed language does have an affect on thinking and the Sapir-Wharf Hypothesis very pragmatically presents this. The first concept provided within the theory, linguistic determination, makes sense when applied to reality. In actual thought one does indeed perceive concepts and objects in accordance to the words used to describe them. This showed me that although all of the responses I received had specific names dining table, coffee table, etc. After determining that this portion did indeed make good sense to me I continued my inquiry into the second portion of the theory, linguistic relativity. The Sapir-Whorf Hypothesis addresses the criteria that are set forth for evaluation and meets them very well. The first of these criteria is that of the theoretical scope. This criterion refers to the comprehensiveness of a theory. When looking at what is included in the possible factors of analysis for this theory, one can see that there are many possibilities: Everything that is encoded and decoded and the language used by society and cultures used all are encompassed in this theory. Appropriateness is also achieved by this theory. The theory expects that the language by which one is surrounded has an affect on how they decode and that encoding differs from language-to-language and cannot always be translated. In experimentation this has been tested and then shown. This was then proven when I actually asked the question. This experiment also supports the heuristic value of the theory. At the time of my experiment I had not even thought of the heuristic

value of the hypothesis. The theory so interested me that I just did the experiment as a means of personally verifying its validity. This validity, which was tested and found to be supported, is the next of the criteria. From the experiment as well as from earlier, more notable ones it can be noted that this theory holds great value. It also accomplishes correspondence validity because the theory is very observable and has been observed numerous times. Furthermore, the Sapir-Whorf Hypothesis is very simple and logically sound. Referring back to the elderly Punjabi, they did not grow up with coffee tables; therefore, it did not come to mind. Likewise, in research done by the authors of the theory, many Indian tribes do not have word for certain objects because they do not exist in their lives. The logical plainness of this idea of relativism clearly provides parsimony. Finally, the Theory of Linguistic Relativity also achieves openness successfully. The theory is shown as a window through which to view the cognitive process, not as an absolute. It is set forth to be used in looking at a phenomenon differently than one usually would. Pragmatically the Sapir-Whorf Hypothesis makes sense. It has the potential to be used in describing a great many misunderstandings in everyday life. This notion of relativity, passes beyond dialect boundaries, and delves into the world of language--from county-to-country and consequently from mind-to-mind. Is language reality truly a ward of thought or is it thought which occurs because of language. The Sapir Wharf Hypothesis very transparently presents a view of reality being expressed in language and thus forming in thought. The principles outlined in it present a very pragmatic and even simple view of how one perceives, but the question is still debatable: Theories of Human Communication.

Chapter 6 : Null Hypothesis - The Commonly Accepted Hypothesis

Read "Hypothesis and Perception The Roots of Scientific Method" by Errol E. Harris with Rakuten Kobo. First published in Routledge is an imprint of Taylor &; Francis, an informa company.

Saul McLeod , published In order to receive information from the environment we are equipped with sense organs e. Each sense organ is part of a sensory system which receives sensory inputs and transmits sensory information to the brain. A particular problem for psychologists is to explain the process by which the physical energy received by sense organs forms the basis of perceptual experience. Sensory inputs are somehow converted into perceptions of desks and computers, flowers and buildings, cars and planes; into sights, sounds, smells, taste and touch experiences. A major theoretical issue on which psychologists are divided is the extent to which perception relies directly on the information present in the stimulus. Psychologists distinguish between two types of processes in perception: Bottom-up processing is also known as data-driven processing, because perception begins with the stimulus itself. Processing is carried out in one direction from the retina to the visual cortex, with each successive stage in the visual pathway carrying out ever more complex analysis of the input. Top-down processing refers to the use of contextual information in pattern recognition. For example, understanding difficult handwriting is easier when reading complete sentences than when reading single and isolated words. This is because the meaning of the surrounding words provide a context to aid understanding. Gregory and Top Down Processing Theory Psychologist Richard Gregory argued that perception is a constructive process which relies on top-down processing. Stimulus information from our environment is frequently ambiguous so to interpret it, we require higher cognitive information either from past experiences or stored knowledge in order to makes inferences about what we perceive. For Gregory perception is a hypothesis, which is based on prior knowledge. In this way we are actively constructing our perception of reality based on our environment and stored information. Therefore, the brain has to guess what a person sees based on past experiences. We actively construct our perception of reality. Richard Gregory proposed that perception involves a lot of hypothesis testing to make sense of the information presented to the sense organs. Our perceptions of the world are hypotheses based on past experiences and stored information. Sensory receptors receive information from the environment, which is then combined with previously stored information about the world which we have built up as a result of experience. The formation of incorrect hypotheses will lead to errors of perception e. Such a mask is generally seen as normal, even when one knows and feels the real mask. An assumption based on past experience. Perceptions can be ambiguous The Necker cube is a good example of this. It becomes unstable and a single physical pattern can produce two perceptions. Gregory argued that this object appears to flip between orientations because the brain develops two equally plausible hypotheses and is unable to decide between them. When the perception changes though there is no change of the sensory input, the change of appearance cannot be due to bottom-up processing. It must be set downwards by the prevailing perceptual hypothesis of what is near and what is far. Perception allows behavior to be generally appropriate to non-sensed object characteristics For example, we respond to certain objects as though they are doors even though we can only see a long narrow rectangle as the door is ajar. What we have seen so far would seem to confirm that indeed we do interpret the information that we receive, in other words, perception is a top down process. In some cases it would seem the answer is yes. For example, look at the figure below: This probably looks like a random arrangement of black shapes. In fact there is a hidden face in there, can you see it? The face is looking straight ahead and is in the top half of the picture in the center. Now can you see it? The figure is strongly lit from the side and has long hair and a beard. Once the face is discovered, very rapid perceptual learning takes place and the ambiguous picture now obviously contains a face each time we look at it. We have learned to perceive the stimulus in a different way. Although in some cases, as in the ambiguous face picture, there is a direct relationship between modifying hypotheses and perception, in other cases this is not so evident. For example, illusions persist even when we have full knowledge of them e. The current hypothesis testing theories cannot explain this lack of a relationship between learning and perception. Relying on individual constructs for making sense of the world makes

perception a very individual and chancy process. The constructivist approach stresses the role of knowledge in perception and therefore is against the nativist approach to perceptual development. However, a substantial body of evidence has been accrued favoring the nativist approach, for example: Constructivists like Gregory frequently use the example of size constancy to support their explanations. That is, we correctly perceive the size of an object even though the retinal image of an object shrinks as the object recedes. They propose that sensory evidence from other sources must be available for us to be able to do this. However, in the real world, retinal images are rarely seen in isolation as is possible in the laboratory. There is a rich array of sensory information including other objects, background, the distant horizon and movement. This rich source of sensory information is important to the second approach to explaining perception that we will examine, namely the direct approach to perception as proposed by Gibson. This is crucial because Gregory accepts that misperceptions are the exception rather than the norm. Illusions may be interesting phenomena, but they might not be that informative about the debate. This suggests that perception is necessary for survival â€" without perception we would live in a very dangerous environment. Our ancestors would have needed perception to escape from harmful predators, suggesting perception is evolutionary. James Gibson argues that perception is direct, and not subject to hypotheses testing as Gregory proposed. There is enough information in our environment to make sense of the world in a direct way. There is no need for processing interpretation as the information we receive about size, shape and distance etc. Gibson argued that perception is a bottom-up process, which means that sensory information is analyzed in one direction: Light rays reflect off of surfaces and converge into the cornea of your eye. Because of movement and different intensities of light shining in different directions it is an ever changing source of sensory information. Therefore, if you move, the structure of the optic array changes. According to Gibson, we have the mechanisms to interpret this unstable sensory input, meaning we experience a stable and meaningful view of the world. Changes in the flow of the optic array contain important information about what type of movement is taking place. The flow of the optic array will either move from or towards a particular point. If the flow appears to be coming from the point, it means you are moving towards it. If the optic array is moving towards the point you are moving away from it. Invariant Features the optic array contains invariant information that remains constant as the observer moves. They supply us with crucial information. Two good examples of invariants are texture and linear perspective. Another invariant is the horizon-ratio relation. The ratio above and below the horizon is constant for objects of the same size standing on the same ground. Affordances Are, in short, cues in the environment that aid perception. Important cues in the environment include: The patterns of light that reach the eye from the environment. The grain of texture gets smaller as the object recedes. Gives the impression of surfaces receding into the distance. When an object moves further away from the eye the image gets smaller. Objects with smaller images are seen as more distant. If the image of one object blocks the image of another, the first object is seen as closer. A large number of applications can be applied in terms of his theory e. His theory is reductionist as it seeks to explain perception solely in terms of the environment. There is strong evidence to show that the brain and long term memory can influence perception. However, his theory cannot explain why perceptions are sometimes inaccurate, e. He claimed the illusions used in experimental work constituted extremely artificial perceptual situations unlikely to be encountered in the real world, however this dismissal cannot realistically be applied to all illusions. For example if you stare for some time at a waterfall and then transfer your gaze to a stationary object, the object appears to move in the opposite direction. Bottom-up or Top-down Processing? Neither direct nor constructivist theories of perception seem capable of explaining all perception all of the time. Research by Tulving et al manipulated both the clarity of the stimulus input and the impact of the perceptual context in a word identification task. As clarity of the stimulus through exposure duration and the amount of context increased, so did the likelihood of correct identification. However, as the exposure duration increased, so the impact of context was reduced, suggesting that if stimulus information is high, then the need to use other sources of information is reduced. Science, , The Senses Considered as Perceptual Systems. A Theory of Direct Visual Perception. The Psychology of Knowing. Concepts and Mechanisms of Perception. Infant Behavior and Development, 13 1 , How to reference this article:

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Richard Gregory proposed that perception involves a lot of hypothesis testing to make sense of the information presented to the sense organs. Our perceptions of the world are hypotheses based on past experiences and stored information.

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Perception occurs when sensory signals are matched to perceptual templates. the hypothesis is confirmed and you experience the objectthat is the "qualia" in the diagram).

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The core idea is that conscious perception correlates with activity, spanning multiple levels of the cortical hierarchy, which best suppresses precise prediction error: what gets selected for conscious perception is the hypothesis or model that, given the widest context, is currently most closely guided by the current (precise) prediction errors 5.