

1: Julian Hochberg, The Perception of Pictorial Representations - PhilPapers

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Bryson Norman Vision and Painting: Goodman, Nelson , Languages of Art: The Bobbs-Merrill Company, Inc. Goodman Nelson and Elgin Catherine Z. Republished in Husserliana X, The Hague: Hyman, John , The Objective Eye: The University of Chicago Press. Kulvicki, John , On Images: Their structure and content Oxford: Lopes, Dominic , Understanding Pictures Oxford: Lopes, Dominic , Sight and Sensibility: Maynard, Patrick , The Engine of Visualization: Thinking Through Photography Ithaca: Maynard, Patrick , Drawing Distinctions: The Varieties of Graphic Expression Ithaca: University of Chicago Press. Image, Text, Ideology, Chicago and London: University Of Chicago Press. Inquiries into the semiotic heritage and its relevance for the analysis of the visual world. Willats, John , Art and Representation: Wollheim, Richard , Painting as an Art London: British Journal of Developmental Psychology, 4, Journal of Genetic Psychology, , Academic Press, New York and London, pp. Virtue and Taste Oxford: Third conference of a series published online at the Semiotics Institute Online. Essays for Richard Wollheim, Oxford: Oxford University Press Cambridge University Press p. Thames and Hudson pp ,

2: Celeste Brusati | U-M LSA History of Art

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Received Sep 6; Accepted Nov This is an open-access article distributed under the terms of the Creative Commons Attribution Non Commercial License , which permits 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 Perception and cognition are highly interrelated. Given the influence that these systems exert on one another, it is important to explain how perceptual representations and cognitive representations interact. In this paper, I analyze the similarities between visual perceptual representations and cognitive representations in terms of their structural properties and content. Specifically, I argue that the spatial structure underlying visual object representation displays systematicity – a property that is considered to be characteristic of propositional cognitive representations. Furthermore, I argue that if systematicity is taken to be a criterion to distinguish between conceptual and non-conceptual representations, then visual representations, that display systematicity, might count as an early type of conceptual representations. Showing these analogies between visual perception and cognition is an important step toward understanding the interface between the two systems. The ideas here presented might also set the stage for new empirical studies that directly compare binding and other relational operations in visual perception and higher cognition. Perceptual information guides our decisions and actions, and shapes our beliefs. At the same time our knowledge influences the way we perceive the world Brewer and Lambert, To the extent that perception and cognition seem to share information, it seems there is no sharp division between the realm of cognitive abilities and that of perceptual abilities. An example is visual perception. Visual processing is composed of different stages Marr, Roughly, at early stages of the visual system, processes like segregation of figure from background, border detection, and the detection of basic features e. This information reaches intermediate stages, where it is combined into a temporary representation of an object. At later stages, the temporary object representation is matched with previous object shapes stored in long-term visual memory to achieve visual object identification and recognition. While early visual processes are largely automatic and independent of cognitive factors, late visual stages are more influenced by our knowledge Raftopoulos, this issue. Examples of cognitive influence on how we perceive the world – that modulates late vision – are visual search and attention Treisman, Knowing the color or shape of an object helps a person to quickly identify that particular object in a cluttered visual scene Wolfe and Horowitz, Phenomena like visual search highlight the fact that visual perception at later stages depends on both sensory and cognitive factors. Late vision is at what philosophers call the personal level: This is apparently not the case for early visual stages, which occur at a subpersonal level, without a person being aware of the information being processed at that stage. Intermediate stages, on the other hand, are probably accessible at a personal level. The degree of representational awareness occurring at this stage is commonly identified with phenomenal consciousness Lamme, ; Raftopoulos and Mueller, It is a matter of debate to what extent intermediate stages of visual processing are influenced by our knowledge i. Some authors argue that those stages are purely visual Raftopoulos and Mueller, and that the transition between pure perception to cognition occurs only at later visual stages, when temporary object representations are matched for recognition and identification. In this paper, I will not propose an argument for whether early and intermediate stages of visual perception are cognitively penetrable. However, I would like to stress that some of the common properties between visual perception and cognition that I will consider already occur at intermediate stages, thus, casting doubt on the claim that mid-level vision is purely perceptual. Cognitive information influences perceptual processes, but, at the same time, cognitive processes depend on perceptual information Goldstone and Barsalou, Recent work in philosophy brought new vigor to the hypothesis originally proposed by British Empiricists that cognition is inherently perceptual Prinz, Such theoretical proposals are supported by empirical findings from psychology. Work on concept acquisition

shows that functions e. The basic hypothesis is that a concept is represented by means of a simulation at the sensory level of an experience of that to which the concept truly applies. For example, to represent the concept APPLE 1, perceptual systems for vision, action, and touch partially produce the experience of a particular apple. Though it seems to be common ground that cognitive and perceptual representations influence each other, they are not taken to be the same kind of representations. Neurophysiological studies distinguish different functional areas for sensory and cognitive systems. Those areas process specific inputs and specialize in different kinds of information processes Zeki, ; Felleman and Van Essen, And distinct sensory areas can be treated as separate modules Barrett, that deal with their specific representational primitives. From a philosophical point of view, visual perception and cognition process information by means of representations that differ in both their structure and content Heck, ; Fodor, One of the main characteristics of cognitive states, paradigmatically of thoughts, is that they have a propositional combinatorial structure that satisfies the requirement of the Generality Constraint Evans, The Generality Constraint describes the pervasive ability of humans to entertain certain thoughts that they have never had before on the basis of having entertained the components of these new thoughts in other preceding situations. For example, from the fact that a person can think that the sky is blue and the car is gray, she can also think that the sky is gray and the car is blue, even if she has never had this thought before. The new thought depends on her conceptual ability to combine already acquired concepts in different ways. This regularity of human thinking is explained by appealing to the fact that thoughts are mental representations with a sentential combinatorial structure Fodor, Thoughts are built up by combining primitive constituents according to propositional rules. The constituent structure of thought is such that whenever a complex representation is tokened its constituents are simultaneously tokened. Failure to represent car or grayness leads to failure to represent that the car is gray. The appeal to the constituent structure of cognitive representations allows us to explain a further property of these representations: Systematicity, similar to the Generality Constraint, describes the human ability to entertain semantically related thoughts. For example, the ability to entertain a certain thought about cars is connected to the ability to entertain certain other thoughts about cars: Systematic recombinations are necessary to satisfy the Generality Constraint but not sufficient. According to the Generality Constraint, once a thinker can entertain a thought, elements of this thought could be in principle indefinitely recombined with every other appropriate concept that a person possesses. This requirement is not part of systematicity, since it leaves open whether it is in principle possible that a finite type of systematicity exists Fodor and Pylyshyn, For what concerns the analysis of the structure of visual representations, I will mostly focus on whether those representations implement a systematic structure of constituents. Acceptance of the Generality Constraint, or the weaker systematicity requirement, also affects how we characterize the content of cognitive and perceptual representations. Philosophers distinguish between two types of content: Typical cases of mental states with conceptual content are cognitive mental states, like thought, belief, desire, and so on: Perception, both personal and subpersonal, is considered a paradigmatic example of states with non-conceptual content. In other words, to have the thought that an apple is red, one has to possess the concepts involved in that thought, but to have a perceptual experience characteristic of seeing a red apple one does not need to possess the concepts involved in the specification. It has been argued that perceptual representations, specifically visual representations, do not satisfy the requirement of systematicity, and, hence, unlike cognitive representations, do not have conceptual content Heck, The argument is based on the idea that visual representations have a pictorial nature. Pictorial theories equate visual representations to images or maps. Like images or maps, visual representations are spatially characterized: Furthermore, like images or maps, visual representations have a holistic character. Unlike cognitive representations, there is no unique structured propositional representation that determines the content of a visual representation. There are many distinct possible decompositions of the same image, such that it is impossible to both identify which are its constituent parts and disentangle the role of these parts in the building up of the pictorial representation. Thus, visual representations, like maps, seemingly lack the syntactic structure of constituents typical of cognitive representations. The lack of a constituent structure entails that visual representations are not systematic. Satisfying systematicity is a necessary condition on satisfying the Generality Constraint. For the reasons above, visual representations do not seem to satisfy

systematicity, and hence the Generality Constraint. Therefore, they have a content of a different kind than the content of cognitive representations: This is both an empirical and theoretical question. From the philosophical point of view, finding out the relationship between perception and cognition will be of benefit to explain phenomena as different as concept formation and acquisition, belief justification, and demonstrative thinking, each of which partly depends on perceptual information. In this paper, I will focus on commonalities between visual perception and cognition that might help explain the communication between those systems. In the first part, I will show that the spatial recombination underlying visual object recognition satisfies the requirement of systematicity. The analysis will take into account the so-called Feature Integration Theory Treisman and Gelade, ; a model that explains visual object representation by considering the spatial nature of visual representations. Although Feature Integration Theory characterizes visual representations as spatially organized, it differs from pictorial theories of visual representations, since it does not commit to the view that visual representations are holistic. In fact, visual representations can be seen as states of the visual system that can be neuronally specified, such that each part of an object representation can be spelled out by considering the different neuronal activations Treisman and Gelade, ; Goldstone and Barsalou, Each neuronal activation roughly corresponds to a part, or primitive constituent, of the representation. Thus, one can decompose an object representation into its primitive constituents and analyze whether a systematic structure of constituents is displayed by visual spatial recombinations Tacca, In the second part, I will argue against the claim that visual representations have non-conceptual content. Based on the analysis in the first part of the paper, I will propose that, if one takes systematicity to be a necessary requirement for having conceptual content, visual representations might be an early type of conceptual representations. I conclude that understanding the link between perception and cognition requires considering whether they satisfy common requirements in terms of structure and content. These similarities might be at the basis of the translation of perceptual representations into cognitive representation and elucidate the mechanism of their interaction. Primitive Visual Features and the Binding Problem Recombination in cognitive processes depends on operations on primitive constituents. A primitive constituent is an entity that corresponds to the smallest meaningful representation carrying relevant information for the processing of more complex representations. Different theories posit different types of primitive constituents Smolensky, ; Fodor, However, there is agreement that the primitive mental representations involved in thought and other cognitive processes, like belief and desire, are concepts. According to an atomistic perspective, concepts cannot be further decomposed into more primitive elements and as such they are the building blocks of thoughts Fodor, However, others have argued that concepts can be further decomposed into their perceptual components e. Those elementary constituents are taken to be symbolic perceptual representations stored at late perceptual stages that become part of cognitive recombinations. Therefore, they share with cognitive representations systematicity, compositionality, and productivity Barsalou, In the following, I will show that intermediate visual representations that contribute to object perception but are not yet stored at late visual stages also display systematicity. The hypothesis that concepts have a structure of constituents that involves perceptual representations is based on anatomical, physiological, and psychophysical evidence for the existence of distinct representations for primitive visual features. Neurobiological Zeki, ; Livingstone and Hubel, ; Felleman and Van Essen, and psychophysical studies Treisman and Gelade, report the existence in visual areas of so-called feature maps. Feature maps code for specific object features, like color, motion, and orientation. They are also topographically organized; namely, they represent a specific feature and the specific location in which the feature occurs in the visual field.

3: Depiction (Stanford Encyclopedia of Philosophy)

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Much of the discussion of this topic comes from either philosophy or aesthetics. This paper reviews some of the more important writings in this area in an attempt to develop a model of representation. The primary works reviewed include: "The Philosophical Contribution to Psychology;" "Pictures and Language;" and "Art, Interpretation, and Perception" In describing the requirements for a general theory of representation, Wollheim says it must answer two questions: What is it to represent? What, in the narrow sense of the term, is a representation? Using his two questions to guide our analysis, we find that the major theoretical issues that need to be investigated include: Is pictorial representation based on natural resemblance or convention? What is the relationship between pictures and reality? Finally, as part of this review, we are investigating if it is possible to develop an overriding theory of representation that accommodates the various issues and viewpoints. The debate here seems to focus on the role of likeness, resemblance, and denotation in depiction. The conventional approach is to define depiction as reference by a visual to something it resembles. This traditional view is expressed by Gombrich who claims that iconicity is genuine representation. Where the information is virtually complete we speak of a facsimile or replica. Even facsimile duplication would not be classed as an image if it shared with its prototype all characteristics including the material of which it is made. A flower sample used in a botany class is not an image, but an artificial flower used for demonstration purpose must be described as an image. In other words, a visual is "of something" and, according to Wollheim, that "ofness" demands that every representation have an objective. Wollheim identifies three misinterpretations of the ofness thesis: In other words, the "ofness thesis" does not deny that the object can be imagined, such as a Unicorn or fictional characters. A number of scholars including Nelson Goodman consider resemblance to be a dogma from which we must free ourselves. Goodman sees all depictions as symbolic, and therefore they must be analyzed within the context of culture and learning. The relationship is not based on "ofness" but on "standing for" and the stands for relationship, which is basically a symbolic one, does not need resemblance. In this respect the visual image is not a mere representation of "reality" but a symbolic system. Likeness is not a matter of how many properties two things have in common. Likeness varies with the comparative importance among the common properties and thus with interest, context, and custom. A picture may count as realistic to the extent that it depicts in the accustomed way. Although he admits that resemblance is intricately related to realism, in his view, realism is an artifact of current pictorial practice: As a matter of fact, he asserts that pictures must always be analog symbols and that the pictorial and the analog are clearly related. He argues that the basic notion of reference, or symbolization, the relation between a symbol and whatever it stands for in any way, governs pictorial representation. The pictorial relationship, in other words, is based on denotative notions of a visual "standing for" something else and that is the meaning of representation. In contrast, David Novitz argues that Goodman and others who deny the importance of resemblance misunderstand the difference between how a picture is produced and how it is used: He believes that picturing does not work by denotation; to say what a picture is of is just to say what kind of picture it is, but is not to say what it denotes. The word "representation" can be used both to mean a picture and to picture, i. Because of his reluctance to assign denotation to visuals, he admits to taking the unfashionable position that "visual resemblance is a necessary condition for picturing, and that recognition of such resemblance is a necessary condition for determining what a picture is of. One way to categorize the nature of the visual is in terms of C. This schema is broad enough to include both Goodman and Novitz. Peircean semiotics defines an icon as similar to its subject; in other words, iconic signs carry some quality of the thing they stand for, as a portrait stands for a person. Most often an iconic sign is a representation such as a drawing or photograph where likeness or resemblance is a determining characteristic. Iconic visuals are highly denotative. An indexical visual is physically connected with its object, an indication or sign or cue that something exists or has occurred—a footprint means someone just walked by or smoke means there is a fire. Iconic visuals are also denotative but

they operate as a puzzle with the viewer involved in an observational guessing game to make sense of the connection and identify the object. Symbolic visuals, however, arbitrarily stand for something through a process of consensus as a word stands for a concept. A symbol, such as a leaf on a flag, is linked by convention with its object. We learn that a maple leaf stands for Canada. Symbols, therefore, are more conventional and their meanings are more open to connotative interpretations. The relationship between the picture and reality, then, is not one way or the other; it depends upon the nature of the sign. Iconic and indexical signs are highly dependent upon resemblance and likeness; symbolic signs, however, depend upon conventional relationships that have to be learned. There may still be some learning involved in making the connection between the visual and what it represents, but with iconic and indexical visuals, the relationship is less arbitrary and more experiential. Arthur Danto notes that in interpreting artwork, this ability to see the objects portrayed in paintings is not something we have to learn in the same way we learn to combine letters into words. Socially conditioned learning is more important for symbolic visuals which are highly arbitrary. This debate focuses on whether the meaning of visual images is established through recognition or convention. This is really a question of how we "see" meaning in visuals, or how we process visual information. The focus of this question is on the operations used by viewers, not on the intentions of creators of images. Convention

Some philosophers argue that all observation is theory laden. In other words, all observations are read in a code using conventions that the observer has internalized. Goodman, for example, argues that visuals represent a code; like language, rules govern the code that controls these arbitrary relationships. The confusion comes because these rules and codes are largely internalized which make them look like natural processes. Goodman argues that pictures are just as arbitrary in their connection to what they represent as language is and that, therefore, a visual can serve as a picture of almost anything if a culture wills it so. Natural Perception In contrast, the objective view sometimes called the naive or essentialist view suggests that the way things look are taken to be objective properties of the visual world, waiting to be perceived by any passing eye. The camera, in this view, simply duplicates what the eye sees, the retinal image. But others propose a more sophisticated view of natural perceptual processing. A number of scholars believe that pictorial representation is a natural process that uses inborn perceptual processes to generate meanings. They believe people make the connection by seeing resemblances which are not arbitrary, but natural. Even though there is a learning process, it involves perceptual experiences rather than social or cultural conditioning. We recognize a picture of a squirrel because it has some characteristics in common with squirrels we have seen in our natural environment. Catherine Elgin also says that pictorial representation is thought to be natural—a matter of resemblance between image and object. This resemblance, moreover, is taken to be an objective matter, visible to the human eye and evident to all who look. Linguistic representation on the other hand, is considered convention-working by rules and stipulations that secure the connection between words and the world. Richard Wollheim also notes a difference between words and pictures. In his view, words follow rules or conventions, however, pictures do not. He argues, for example, that the relationship between the word bison and the animal is arbitrary, not so for pictures. Paul Messaris suggests that people make sense of pictures largely on the basis of their reproduction of real-world informational clues. While he does not subscribe to the objective reality view, he also does not believe that learning to make sense of visuals is comparable to learning to use language. He explains, "the representational conventions of images, unlike those of language, are typically based on informational cues that people learn to deal with in their everyday encounters with their real visual environments. He believes that visual perception is much too important to animal survival to be deeply penetrated by theory rules and codes. Pictorial competence is natural. Pictorial perception takes place at a level "beneath the threshold of interpretation: Danto suggests that because animals do not have the motor ability to draw, this may in some way affect how they perceive pictures. Umberto Eco and Thomas Sebeok makes the argument that the roots of abduction lie far back in time with hunters and trackers who could read the signs of nature, much as Sherlock Holmes does. Medicine, in its procedures for detecting symptoms is another area that uses abductive thinking. Conan Doyle was trained in medicine and used one his medical professors as the model for Sherlock. Visual interpretation of representations may be described as abductive in that it begins with observing clues in the visual perception and moves to a conclusion by hypothesizing relationships and

patterns cognition, convention through massive parallel processing. Abduction builds on natural perception at both the iconic and indexical levels and sets the stage for more complex forms of cognitive processing, particularly the type of cognitive and conventional processing needed to make sense of symbolic visuals. In this sense, abduction lies midway between natural perception and cognitive processing. His approach embeds representation in cognitive or information processing theories, and particularly schema theory, which explains how mental models and maps work. They seem to be arguing that Gombrich is saying that visual representation is all code and that notions of reality and of nature and mimesis have no place. All that remains are different systems of conventional signs which are made to stand for an unknowable reality-an out and out relativism. He quotes another interpretation of his book by an archaeologist as seeing representation as the end product on a long road through schema and corrections. He points to the creation of certain visual effects which were discovered by trial and error in certain societies under the pressure of novel demands made on the image. This processing of the patterns, however, is based on the recognition of visual elements which serve as the first step in relating an image to a meaning. He says to his critics: He suggest that we look for the roots of representation in biology and animal behavior and describes it as, "Our twin nature, posed between animality and rationality. He suggests that not only is our vision subjective, i. Our representations, in other words, become maps for our seeing. It is, however, conventional activity, and its products are conventional in the sense that they are the products of human choice and skill, and they are made for the sake of satisfying culturally and historically evolved and changing needs and wants. In an article on how cameras "see," Wartofsky argues that our perceptual process is socially and culturally moderated: It is the product of our own making. Starting with the mammalian eye, in biological evolution, we have transformed visual perception by means of transformations of our visual praxis-the ways, or modes, of our visual activity. The instrument of this transformation is the pictorial representation.

4: Perception and pictorial representation - Calvin F. Nodine - Google Books

Another paper discusses pictorial functions and perceptual structures including pictorial representation, perceptual theory, flat canvass, and the deep world. One paper suggests that perception can be more a matter of information "make up" than "pick up."

Perception and Artistic Style explores the role of visual processes in the creation and perception of painting and drawing. By looking at the relationship between perception and representation evidence is provided that purely visual processes are a richer source of artistic inspiration than is commonly realised. Many of the obvious variations in artistic style are firmly rooted in visual perception and visual cognition. This book looks at a range of fundamental visual processes and investigates their contribution to major stylistic features of works of art. A wide selection of pictures is considered; ancient, medieval, renaissance, nineteenth and twentieth century and primitive, and both well known and relatively obscure works are examined. The volume includes 86 figures, 13 grey-scale illustrations of artworks and 43 line drawings. Explores questions relating to the nature of representation in art. It asks how we recognize likeness in caricatures or portraits, for instance, and presents the conflicting arguments and opinions of an art historian, a psychologist and a philosopher. How can we best describe the processes by which we visually perceive our environment? Contemporary perceptual theory still lacks a coherent theoretical position that encompasses both the limitations on the information that can be retained from a single eye fixation and the abundant phenomenal and behavioural evidence for the perception of an extended and coherent world. As a result, many leading theorists and researchers in visual perception are turning with new or renewed interest to the work of Julian Hochberg. For over 50 years, in his own experimental research, in his detailed consideration of examples drawn from a wide range of visual experiences and activities, and most of all in his brilliant and sophisticated theoretical analyses, Hochberg has persistently engaged with the myriad problems inherent in working out the kind of coherent theoretical position the field currently lacks. The complexity of his thought and the wide range of areas into which Hochberg has pursued the solution to this central problem have, however, limited both the accessibility of his work and the appreciation of his accomplishment. To facilitate the understanding of his accomplishment, and of what his work has to offer to contemporary researchers and theorists in visual perception, we include commentaries on salient aspects of his work by 20 noted researchers. Review of current knowledge, research, and theory on human vision, and the information processing it involves. Includes implications for image presentation and interpretation. For researchers in medical imaging and bioengineering. Brian Leigh Molyneaux Language: Pictures are often admired for their aesthetic merits but they are rarely treated as if they had as much to offer as the written word. They are often overlooked as objects of analysis themselves, and tend to be seen simply as adjuncts to the text. Images, however, are not passive, and have a direct impact that engages attention in ways independent of any specific text. Advertising, entertainment and propaganda have realised the extent of this power to shape ideas, but the scientific community has hitherto neglected the ways in which visual material conditions the ways in which we think. This volume is not concerned with the accuracy of pictures from the past or directly about the past itself, but is interested instead in why certain subjects are selected, why they are depicted the way they are, and what effects such images have on our idea of the past. This collection constitutes a ground-breaking study in historiography which radically reassesses the ways that history can be written.

5: Bayesian Action&Perception: Representing the World in the Brain

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Introduction Art and Illusion: A Study in the Psychology of Pictorial Representation, published in 1956, is one of the most influential books written during the twentieth century on the subject of art. Those lectures became the book Art and Illusion. Gombrich continued to advocate many of the ideas put forth in this book throughout his life. Indeed, he not only revised the text and wrote a new preface for the second edition of the book published in 1974, he also wrote a new preface for the "Millennium Edition" published in 2004, in his ninety-first year. In Art and Illusion, Gombrich poses this essential question: At the heart of his theory is the notion of "schemata," that is, the idea that the artist "begins not with his visual impression but with his idea or concept" and that the artist adjusts this idea to fit, as well as it can, the object, landscape, or person before him or her. Gombrich calls this theory "making and matching. Thus, serious students of art and art history find Art and Illusion an important and necessary part of their education. Gombrich, a lawyer, and Leonie Hock Gombrich, a pianist. Gombrich credits his intellectual development to the music in his home. Leonie Gombrich was also well-acquainted with the great modernist composer Arnold Schoenberg and Sigmund Freud, the father of psychoanalysis. Gombrich said that he made his decision because "art was a marvelous key to the past" The Essential Gombrich. At the university, he studied with the great art historian, Julius von Schlosser. Another important influence in the life of young Gombrich was Ernst Kris, who asked Gombrich to help him write a book on caricature which incorporated the work of Freud. The rise of Nazism in Germany, however, interrupted the project, and Kris encouraged his Jewish assistant to leave Austria. His duty was to listen to and translate German radio broadcasts for the use of the military. With the end of the war, Gombrich returned to the Warburg Institute, becoming its director in 1945. During the 1950s, Gombrich wrote prolifically and lectured widely. His introduction to Western art, The Story of Art, was published in 1950. Since that time over six million copies of that volume have been sold. In 1956, Gombrich gave a series of Mellon lectures in Washington, D. C. A Study in the Psychology of Pictorial Representation Over the next forty-two years, Gombrich published more than twenty books and hundreds of journal articles. His last full-length book, The Preference for the Primitive, was published in August 1988. During his lifetime, Gombrich received many honors and awards. Most notably, he was named a Commander of the Order of the British Empire in 1974, and he was knighted in 1981. Gombrich died in London on November 3, 2004, at the age of 88. He is generally acknowledged to be one of the most influential art historians of all time. Plot Summary Part 1: The Limits of Likeness In the introduction to Art and Illusion, Gombrich asks the question, "Why is it that different ages and different nations have represented the visible world in such different ways? First, however, he provides the reader with a critical account of the history of style and the psychology of representation. He explains the many ways that artists through the years have learned how to represent light in their paintings. Chapter Two, "Truth and Stereotype," begins with a discussion of how a picture can be neither true nor false. By contrast, the caption of the picture can be so judged. Further, when artists undertake to paint pictures, they start not with what they see, but rather with an idea or concept, what Gombrich calls a "schema. Painting is an activity and the artist will therefore tend to see what he paints rather than paint what he sees. In so doing, the artist particularizes, starting with an idea, say, of chairness, and particularizing this idea until it represents the chair that is the subject being painted. The section continues with a description of how Greek art moves from a stiff rendering to more "lifelike" rendering. Gombrich asserts that this is a perfect illustration of the theory that making always occurs before matching. That is, an artist or culture begins with a schemata, which the artist then adjusts and corrects to make it ever closer to the appearance the artist wants the creation to have. Gombrich then moves to an exploration of "the basic geometric relationships that the artists must know for the construction to be a plausible figure. These books, according to Gombrich, "form a reservoir of formulas or schemata which spread throughout Europe. For Gombrich, however, "effective portrayal" is only possible when the artist goes beyond the formulas and demonstrates a willingness "to correct and revise. Gombrich relates this tendency to what psychologists call

"projection," wherein a person projects onto another person his own desires and personality. A beholder of art will likewise project his or her catalog of classifications onto the images created by artists. In this case, the artist creates and the beholder projects; both are necessary ingredients in the making of meaning. He discusses how our knowledge and expectations contribute to what we actually see or hear. The greater the likelihood a given word will occur, the less likely we are to listen. It is in this context that projection will do for perception. Artists cannot represent every detail of reality, no matter how painstakingly they work. It is the creation of an illusion that allows the beholder to fill in the details. In Chapter 8, "Ambiguities of the Third Dimension," Gombrich tackles perspective and the "rendering of space in art. A painting clearly has only two dimensions, height and width. In order for the painting to have depth, however, the painter must engage in the art of perspective. As Gombrich argues, "One cannot insist enough that the art of perspective aims at a correct equation: That is, a viewer estimates the distance of an object by how large or small it appears. Image makers take advantage of this assumption. In opposition to Gestalt psychologists, Gombrich asserts that interpreting perspective in a flat image is a learned behavior rather than an innate skill. In this, he draws on the work of philosopher Sir Karl R. Painting, then, that accounts for perspective is illusionist painting, meant to be viewed by a beholder who "willingly suspends disbelief" and sees what he or she expects to see, not what is really in the painting. Gombrich credits the rise of cubism, by contrast, to a "radical attempt to stamp out ambiguity and to enforce one reading of the picture" that of a man-made construction, a colored canvas. Invention and Discovery After recapitulating his stance on the power of interpretation, Gombrich next offers a brief history of perception, referring to Bishop Berkeley, John Ruskin, and Roger Fry. Gombrich argues that "all thinking is sorting, classifying. The eye is connected to the brain and the experience of the viewer, and the perception of any viewer will make meaning using that connection. For the painter, this process is deeply affected by his or her ability to view his or her subject in terms of the traditions of painting. With Constable, who viewed art as natural philosophy or science, Gombrich agrees that "only experimentation can show the artist a way out of the prison of style toward a greater truth. Only through trying out new effects never seen before in paint could he learn about nature. Making still comes before matching. Gombrich argues that "pure observation" is impossible in either science or art. Rather, all observation is predicated by hypotheses, which in turn, create expectations. Only through testing hypotheses do scientists and artists amend their already perceived picture of reality. In one of the most interesting chapters of the book, Gombrich turns to a discussion of caricature, drawing on his earlier work with Ernst Kris. He uses the work of Freud and other psychologists in the exploration of the "minimum clues of expression," those features that allow a viewer to see a face in only a few lines. Finally, Gombrich closes this section and the book with a discussion of the similarities between "the language of words and visual representation," concluding "the true miracle of the language of art is not that it enables the artist to create the illusion of reality. It is that under the hands of a great master the image becomes translucent. In addition, he was an early writer on the Gestalt theory of thinking, which worked its way into the theory of art through Rudolf Arnheim. John Constable John Constable, an early nineteenth-century English landscape painter, was one of the first painters to consider science and observation in his understanding of painting. Gombrich devotes a chapter of Art and Illusion to Constable and his experiments with paint and light, noting that Constable remarked, "Painting is a science and should be pursued as in inquiry into the laws of nature. Why, then, may not landscape painting be considered as a branch of natural philosophy, of which pictures are but the experiments? Sigmund Freud Sigmund Freud, the great Viennese psychologist and the founder of modern psychiatry, attempted to chart in a scientific manner the mysterious regions of the human psyche. According to Gombrich, Fry hailed "impressionism as the final discovery of appearances. William Hogarth Gombrich states that William Hogarth was one of the most interesting of eighteenth-century artists. Hogarth produced a series of prints called Characters and Caricatures. According to Gombrich, Hogarth believed that "caricature rests on comic comparison" while character "rests on the knowledge of the human frame and heart. Kris was acutely aware of the rise of the Nazi Party, and he urged Gombrich to leave Austria to find work. Gombrich credits Kris for both his fortuitous move from Austria and his first job. Popper Karl Popper was a highly influential philosopher. Born in Vienna like Gombrich, Popper also immigrated to London. Most notably, Popper rejected what he called the "bucket theory of mind. This theory defines the

mind as a passive recipient. Popper opposed his own "searchlight theory" of mind to the bucket theory. He hypothesized that gathering information about the world is an active proposition, one that requires the mind to match internal schemata with sensory information from the world. Most importantly for Popper and for Gombrich is the notion of "activity. John Ruskin John Ruskin was a prominent Victorian art and literary critic as well as a social reformer. Born in , Ruskin became interested as a child in art and architecture. Ruskin is perhaps most famous for his multi-volume work *Modern Painters*. This book exerted tremendous influence on nineteenth-century artists, critics, and viewers. Ruskin championed the work of artist J.

6: Art and Illusion: A Study in the Psychology of Pictorial Representation | www.enganchecubano.com

Considered a great classic by all who seek for a meeting ground between science and the humanities, Art and Illusion examines the history and psychology of pictorial representation in light of present-day theories of visual perception information and learning. Searching for a rational explanation of.

Resemblance Theories of Depiction 1. The idea is intuitively plausible, and it provides the basis for a variety of attempts by philosophers to define or analyse the concept of a picture, or to explain how pictures represent. It is true that pictures represent things that do not have shapes or colours, such as God and Justice, but they do so by depicting things that do have shapes and colours, such as bearded men and blindfolded women carrying scales. Accordingly, the basic thought that underlies resemblance theories of depiction is that pictures are composed of shapes and colours that resemble the shapes and colours of the visible objects they depict. But even if this provides an adequate starting-point, a convincing theory of depiction needs to be elaborated with care, as Nelson Goodman showed. The simplistic claim that A depicts B if and only if A appreciably resembles B is demonstrably false. Peirce described pictures as iconic signs, i. Moreover, Peirce acknowledges that these three categories of sign are not mutually exclusive, and that the signification of a picture can also depend on iconographic conventions, and on its context of use. But arguably the formula has some heuristic value, because it draws attention to some of the challenges a theory that explains depiction in terms of resemblance will need to address. Thus, according to Goodman, resemblance is a reflexive and symmetric relation, whereas representation is neither: Furthermore, many pictures resemble other pictures, such as copies of them, more closely than they resemble their objects, but they do not represent those pictures. For according to philosophers who favour the approach, the idea of resemblance is used to explain what makes a pictorial representation specifically pictorial, rather than what makes it generically representational. The depictive relation between a portrait and its subject is indeed neither reflexive nor symmetric. But resemblance remains a candidate for explaining what makes a representation pictorial or figurative, and therefore how a portrait of an individual differs from a text describing her appearance. However, the example of a portrait brings us to another objection to resemblance theories of depiction, which Goodman mentions in passing For if resemblance is a relation, and if the relata of a relation must be existing particulars, then it appears that pictures that represent fictional individuals Zeus, Pegasus , and genre pictures, which represent kinds of objects without representing any particular instances of them, cannot resemble what they represent. Hence, even if it is plausible that a resemblance theory can explain how a portrait represents a sitter, it cannot provide a general explanation of depiction. One response to this argument is to claim that fictional characters are abstract entities that actually exist Kripke Another is to claim that a fictional character can be a genuine relatum of a relation without existing: But even if one of these responses is correct, and the objection therefore fails to show that the concept of resemblance is unsuited to explaining how pictures represent fictional characters, the problem of genre pictures remains. However, John Hyman If this is right, the objection also fails to show that the concept of resemblance is unsuited to explaining generic depiction cf. Goodman places more weight on a third objection to resemblance theories of depiction. A theory of this kind, he maintains, would need to specify the visible aspect or aspects of its object that a picture imitates or copies. But every object can be seen in many ways, depending on the experience, interests, and attitudes of the viewer: According to Goodman and Gombrich, resemblance theories of depiction depend on the mistaken assumption that visual perceptions result from a process of interpreting two-dimensional patterns of raw colour, without any intrinsic meaning, which artists are trained to observe and record. Psychologists such as Hermann von Helmholtz, artists such as Claude Monet, and art theorists such as John Ruskin embraced a theory of painting of this kind. The whole technical power of painting depends on our recovery of what may be called the innocence of the eye; that is to say, of a sort of childish perception of these flat stains of colour, merely, as such, without consciousness of what they signify. But it is not an essential part of such a theory. If the depiction of an object depends on the imitation of its form and colour, it follows that an artist must be able to perceive these properties and reproduce them, but it does not follow that we need to conceive of painting in

the way Ruskin recommends. For as Descartes pointed out, it is unclear how the 2-D shape of a mark on the surface of a painting or drawing can resemble the 3-D shape of an object it depicts; and the use of foreshortening shows that rhombuses can represent squares better than squares, ovals can represent circles better than circles, and so on [] Furthermore, some pictures for instance, cubist paintings do not bear much obvious resemblance to the objects they depict in either form or colour. Hence, the basic idea that depiction depends on resemblances in form and colour will need to be specified in such a way as to meet what Dominic Lopes calls the diversity constraint Lopes Different resemblance theorists have responded to these challenges in different ways. John Hyman and Catherine Abell have proposed different theories of depiction in which the idea of resemblance plays a significant role. Hyman rejects the theory that pictures are iconic signs Both phrases refer to one and the same object, the planet Venus, but they describe or present it as a star that is visible at different times of day. They portray refer to the same individual, but they present him differently they differ in sense. The claim that A depicts B if and only if A appreciably resembles B, which Goodman criticizes, is about depiction qua portrayal, i. According to Hyman, the sense or mode of presentation of a picture, expressed in the most general terms, is an aspect or view of an object or arrangement of objects, relative to an implicit point or a variety of points of view. Different parts of a picture can present different aspects of an object or its parts, corresponding to different points of view, but nothing can be depicted independently of a point of view. Otherwise, Hyman points out, [we could] discover different aspects of an object represented in a picture by moving around it and studying it from different angles, as we can in the case of a free-standing sculpture. We shall concentrate on shape. For example, the occlusion shape of a circular coin viewed obliquely is an ellipse. This shape, Hyman argues, is a visible property of the coin. It is especially salient when an object is backlit, and appears in silhouette. It is relative to a point of view, and changes as the point of view changes. But Hyman insists that relative does not mean subjective. In other words, there is an exact resemblance between these shapes Together with a principle concerning colour, it is supposed to explain how the colours and shapes on the surface of a picture fix the colours and shapes of the objects it depicts. Nor do they imply that a painting of a bearded man resembles a bearded man, since they are only concerned with the shapes and colours of the objects in a picture. He explains how these two elements of a theory of depiction can be combined with the example of a silhouette: First, and most generally, Michael Podro argues that it expresses a bias in favour of realistic or literal representation Podro Third, it has been argued that indeterminacies in the occlusion shapes of objects represented in a picture may not match the indeterminacies in the shapes of the parts of the picture that depict them Kulvicki It is also a more ambitious theory, both because Abell does not distinguish between the sense and reference of a picture, but aims to explain both at once, and because she explains the depiction of specific kinds of objects, such as men and horses, in terms of resemblance, instead of confining the scope of the theory to the shapes and colours of the objects in a picture. Unlike Hyman, Abell does not specify which particular respects of resemblance are necessary for depiction, beyond the requirement that they should be visible As noted above, Abell regards pictures of objects that do not actually exist as problematic for resemblance theories of depiction. Her solution to the problem combines two ideas: Abell argues that because she does not specify which particular respects of resemblance are necessary for depiction, her theory is consistent with the diversity constraint, in other words, it accommodates the wide variety of stylistic conventions that have developed in different artistic traditions. However, it can be objected that it fails to accommodate another alleged constraint on an adequate resemblance theory of depiction identified by Lopes, which he calls the independence constraint. In fact, this objection only applies to a theory which implies that a spectator perceives a certain kind of object in a picture by perceiving a resemblance between the marks on its surface and an object of this kind, and a resemblance theory need not have this implication. However, she addresses the objection by highlighting alternative, context-specific sources of information about them Abell , ; cf. Conventionalist Theories of Depiction Resemblance theories of depiction differ from one another in significant ways. But they agree on the following crucial point: It is widely agreed that linguistic representation depends on conventions that create the vocabulary of a language and the semantically significant structures in which the elements of its vocabulary are combined. But the contribution words and structures make to the meaning of a sentence are hardly ever

explained by resemblance. If there are exceptions, such as onomatopoeia, they confirm the rule. Conventionalism was well established by the 19th century. What does exist is the skill of reproducing handy graphic symbols for natural appearances, of rendering familiar facts by set professional conventions. Goodman accepts that pictures may resemble the objects they depict, but he denies that this explains why they depict them: A picture that represents "like a passage that describes" an object refers to and, more particularly, denotes it. Denotation is the core of representation and is independent of resemblance. First, it is supposed to be the relation in which a name stands to its bearer, or a predicate stands to the members of its extension, or a portrait stands to its subject. Equally, the same predicates do not denote different individuals because they resemble each other, or have properties in common. On the contrary, they resemble each other, or have properties in common, because the same predicates denote them. Hence, resemblance is explained by, and therefore cannot itself explain, denotation. According to Goodman, pictorial symbol systems differ from linguistic ones in being analog and relatively replete, an analog system being one that is syntactically and semantically dense. For reasons of space we shall not discuss the relationship between analog and dense; see Lewis and Haugeland. Finally, a pictorial system is relatively replete because relatively many properties of a picture are relevant to its interpretation: Any thickening or thinning of the line, its colour, its contrast with the background, its size, even the qualities of the paper—none of these is ruled out, none can be ignored. Denotation is the core of representation, including depiction. All three claims have been contested. The first difficulty with 1 is that a set is dense only relative to an ordering. For example, the set of natural numbers can be given a dense ordering, but it is not dense in the familiar 1, 2, 3, ... ordering. In the first edition of *Languages of Art*, Goodman does not explain what ordering of pictures he has in mind, but in the revised edition he states that the ordering in question is understood to be such that any element lying between two others is less discriminable from each of them than they are from each other. First, is an ordering of pictures of this kind possible? The second difficulty with 1 is that digital photographs would normally be classified as pictures along with analog ones (Bach; Kulvicki); and some diagrams, which would not normally be classified as pictures, are analog and relatively replete (Peacocke). Furthermore, outline drawings are less replete than diagrams in which not only shape but also colour affects what they represent, but the former would normally be classified as pictures, whereas the latter would not (Schier; Kulvicki). For we want to know how pictures, including digital photographs, represent. The principal ground on which philosophers have contested 2 is that it is inconsistent with the so-called natural generativity of pictures. The argument is originally due to Flint Schier. Hence, it is arguable that Schier and Wollheim mistook a disanalogy between pictures and words for a disanalogy between pictures and conventional signs in general. First, what explains the fact that a picture has a particular denotation, e. Second, denotation is a relation—the relation between a name and its bearer, or between a predicate and the members of its extension. If the relata of a relation must be existing particulars, then it appears that pictures of these kinds cannot denote what they depict. So how do they depict them? He claims that what a painting or drawing denotes pictorially depends solely on the arrangement of colours on its surface, and the semantic and syntactic conventions that define the symbol system to which it belongs. But it seems to follow that few portraits, if any, portray a single individual, as opposed to every member of a class of similar individuals. For if pictures are effectively predicate-like symbols in a pictorial system, then unless X is the sole individual satisfying a portrait, i.

7: Project MUSE - Problems of Pictorial Perception

Pictorial Representation helping me in my first journey through his *Phenomenology of Perception*, which I find.

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Abstract Theories of perception seek to explain how sensory data are processed to identify previously experienced objects, but they usually do not consider the decisions and effort that goes into acquiring the sensory data. Identification of objects according to their tactile properties requires active exploratory movements. The sensory data thereby obtained depend on the details of those movements, which human subjects change rapidly and seemingly capriciously. Bayesian Exploration is an algorithm that uses prior experience to decide which next exploratory movement should provide the most useful data to disambiguate the most likely possibilities. In previous studies, a simple robot equipped with a biomimetic tactile sensor and operated according to Bayesian Exploration performed in a manner similar to and actually better than humans on a texture identification task. The biomimetic design of this mechatronic system may provide insights into the neuronal basis of biological action and perception.

Bayesian exploration, touch, tactile sensing, perception, somatosensory, affordance

Can robots perceive in the same manner as humans? How can we reconcile the apparently chaotic behavior of humans exploring their environment with their extremely effective judgment? The brains of higher primates are extraordinarily good at interpreting, learning, and recognizing complex situations and formulating appropriate responses to them, yet the details of their behaviors while doing so are maddeningly noisy to the experimental observer and inconsistent with the deterministic behavior expected of optimally engineered systems. Humans observing a visual scene cause their eyes to dart in sequences of saccades that seem capricious and are often repetitive (Yarbus and Riggs). Humans trying to identify an object by touch select specific movements according to the relevant properties (Jones and Lederman), but the details tend to be inconsistent and sometimes repetitive, frequently changing posture, velocity, and force of the fingers (Morley et al.). Nevertheless, the improvements in elegance, speed, and accuracy of object identification as children develop (Morronegiello et al.). The internal details of neural activity that must ultimately be the cause of exploratory behaviors are also not machinelike or consistent. Even when the motor behavior is tightly constrained to be repetitive, the activity of the individual neurons in the cerebral cortex varies wildly from trial to trial (Churchland et al.). This neural activity is not random, as can be seen by averaging data from many trials and extracting correlations with specific features of the behavior. Nevertheless, an engineer would wonder how such a badly designed machine manages to perform so remarkably well. The sensor has mechanical properties and sensing modalities that are similar to the human fingertip (Fishel et al.). Humans actively exploring surfaces use a wide variety of rapidly changing forces and velocities, but they vary inexplicably between subjects and between presentations of a single texture to a single subject; nevertheless, subjects discriminate surfaces accurately and fairly rapidly (Morley et al.). We initially considered that the movements observed in humans might simply be noisy and their details irrelevant, so we tried to compute features such as spectral patterns in skin vibrations that might be constant and distinctive for textures over a wide range of movement parameters. Through experimentation it became clear that those extracted features actually did depend strongly on the contact force and velocity of the exploratory movements. Furthermore, there was no predictable relationship across objects; e. Interpreting the tactile data required judicious selection and consideration of these exploratory parameters.

Biomimetic Mechatronic systems whose designs and functions are enabled by features and principles of operation found in biological systems. This review considers what high level strategies and internal representations might account for complete behaviors that include both action and perception. This review attempts to unify the concepts of perception and action by drawing parallels between the visual system, which is usually considered from the

perceptual perspective, and the haptic system, which is usually considered from the action perspective.

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*CHAPTER 1 M A R G A R E T. H. G E N Generative Theory: A Perceptual Theory of Pictorial Representation
Introduction: M a j o r Issues and Theories in Perception Constructivist Theory of Perception Constructivist Theory of Representation Critique of Constructivist Theory of Representation Gestalt Theory of Perception Gestalt Theory of Representation Critique of Gestalt Theory of.*

9: Commonalities between Perception and Cognition

pictorial representation", the close relationship of the layout of the picture to that of the Images, imagination, and movement: Pictorial representations and their development in the work of James Gibson.

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