

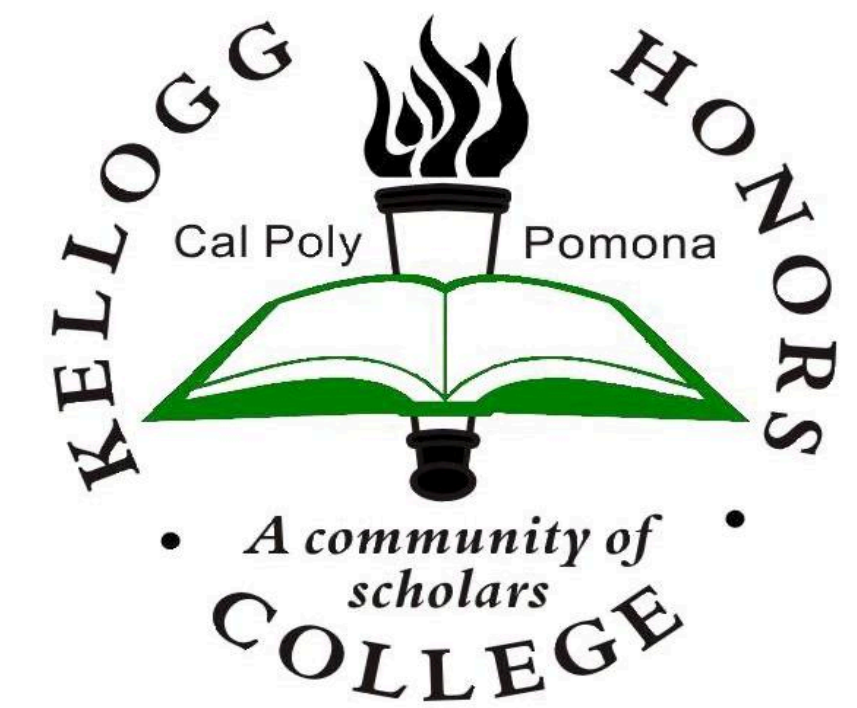
Perception and Judgment



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Abstract

Cognitive science is the intersection of biology, psychology, philosophy, linguistics, artificial intelligence, and computer science that focuses on the study of mental phenomena and its classifications. The nature of the mind has piqued the interest of scientists and philosophers for centuries, but we struggle to understand it because of inherent limitations of phenomenology (i.e., the inability to accurately and informatively self-report cognitive activity). Hence, studying consciousness is a black box problem because we cannot directly study cognition due to its elusive nature. In particular, one familiar cognitive product is perception, which refers to information that has registered in the mind and intangible qualia that manifest within the subjective experience. Judgment, on the other hand, is the subsequent metacognitive construction that consists of the linguistic report of epistemological concepts as a result of perception. Current vernaculars suggest that perception and judgment are interchangeable, however we should make clear distinctions when studying the mind in scientific contexts to make further refinements in cognitive classifications. All in all, cognitive science in the forms of psychological studies, computer modeling, and epistemological literature will have important implications in understanding artificial intelligence and ourselves.

I propose that there is a theoretical need to distinguish between perception and judgment.

Sensation, Perception, and Judgment

Sensation, perception, and judgment should be considered separate processes that occur in that order. It is very common to jumble all of these processes together in everyday language. This makes it difficult to discuss theoretical topics in cognitive science because it creates confusion and facilitates misinterpretation. Experimental psychologists, philosophers, and cognitive scientists alike need to practice care to distinguish sensation, perception, and judgment on the grounds that they have important distinctions. A scientific approach will be taken in this argument. Note that previous iterations of sensational and judgmental states can influence a current perceptual state.

Sensation

- Bio-physical reception of a stimulus
- Cognitive mechanism
- Translation and transmission of physical receptions of stimuli in the form of encoded electro-chemical impulses
- Constructive bottom-up process

Perception

- Mental registration of information and psychological experience of a stimulus
- Cognitive product
- Equates to qualia or the what-it-is-likeness to experience something
- Equates to ineffable subjective experience
- Intersection of current bottom-up and previous top-down processes

Judgment

- Metacognitive interpretation of the subjective experience of a stimulus
- Cognitive product
- Abstract and inferential process that is linguistic in nature
- Postdictive analysis that is preceded by a consciously inaccessible predictive analysis
- Easily associated with recognition
- Type I processing occurs naturally without conscious input or intervention
- Type II processing involves the escalation of cognitive resources to include conscious and critical thought patterns
- A single perceptual state can have multiple realizable consequential judgmental states
- A change in judgmental states is equivalent to a Gestalt switch
- Prior-oriented top-down process
- Limitations in phenomenology, language, and the pre-judgment process are the cause of restriction in terms of what can be judgmentally formulated



Assumptions

- (1) There exists at least one mental state with existing correlated biological and physical states.
- (2) The unconscious mind is not a factor in this argument. Essentially, its existence is possible, but it makes it easier just to ignore its possible existence because it would be difficult, if not impossible, to isolate integral functions.
- (3) Metacognition is linguistically accessible. That is, all metacognitive activity can be expressed in the terms of language.
- (4) People have marginally varied (theoretically comparable) sensational and perceptual states to the same stimulus. Even though neurologically there are vast differences, there is still a natural language in terms of how sensations are encoded, so there must be some underlying organic framework at large.

The Nature of Judgment

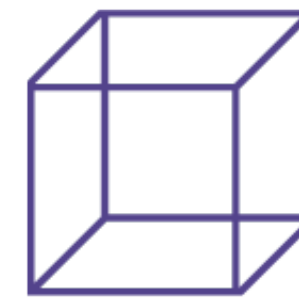
William James (1890): bodily expression precedes emotion. In other words, James says that the body reacts before the mind responds. For example, if the body trembles, then the mind will subsequently judge itself as being afraid. As such, judgment is naturally a metacognitive analysis that comes as a consequence of psychological perception.

- Judgmental states epistemologically describe interpretations of perceived stimuli
- Bodily expressions precede psychological action
- Judgmental states affect future perceptual and judgmental states

The Necker Cube

Macpherson (2017): The ambiguous graphic does not have a single correct interpretation such that the image can be interpreted in at least three ways:

- a 3-D cube viewed from a top angle
- a 3-D cube viewed from a bottom angle
- a set of polygons with no apparent depth



Preexisting notions and expectations (priors) inadvertently affect the way future judgmental states are constructed. A Gestalt switch officially occurs when you see something different.

- Priors allow for multiple possible judgments of a single perception

Acquired Taste

What does it mean for a food item to be an acquired taste? Generally speaking, it means that a person has to have a specific palette of taste to enjoy that particular food item.

- Taste preferences determine what foods someone enjoys
- Priors may affect sensation but certainly affect judgment
- Opinions are judgmental states

Social Context and Autism

Social cues correspond to judgmental states and are evaluations of social situations and norms. People with Autism Spectrum Disorder (ASD) have a condition in which they are less likely to detect social cues and judge social contextual information differently than someone without autism. In particular, those that have autism are predominantly predisposed to have difficulties with social interactions and recognizing emotions.

- Individuals with ASD tend to produce judgmental states about social situations that indicate difficulties detecting social cues
- Social constructions are higher order judgmental states and not something that can be perceived

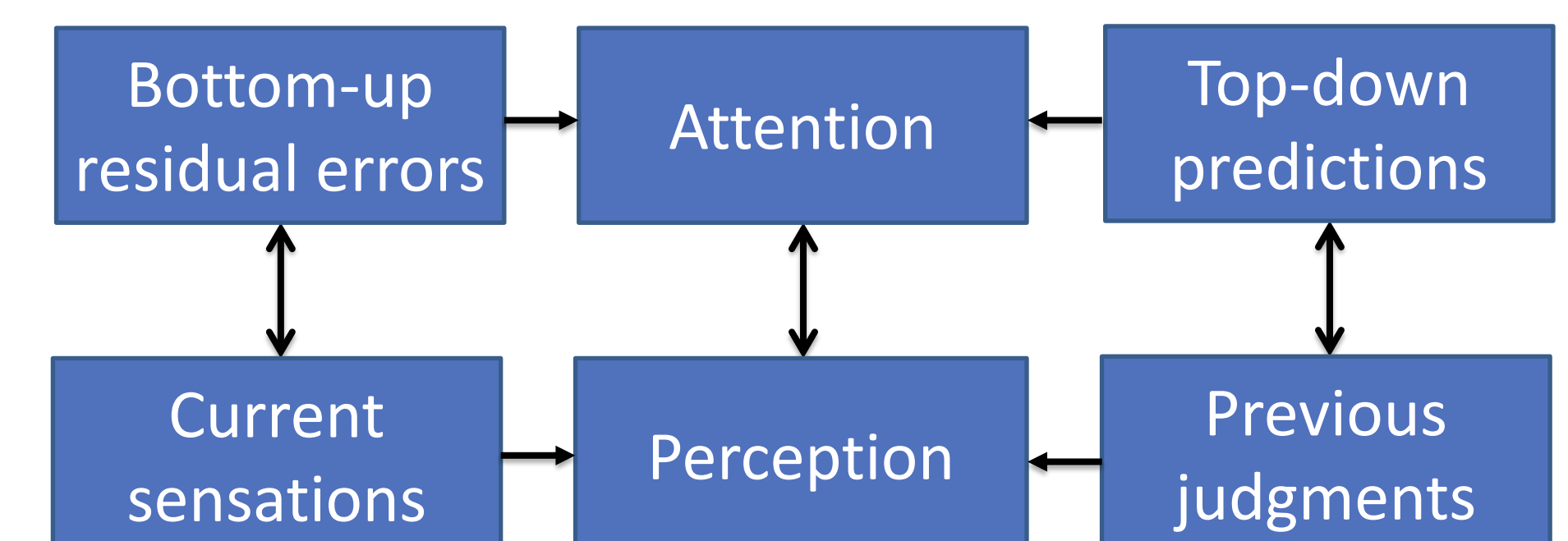
The Spinning Dancer

Kayahara (2003), spinning dancer Silhouette Illusion: The sensation of viewing the spinning dancer never changes, and we know this because the GIF is a graphic that loops. The perception also never changes such that the grayscale colors remain constant and it is a continuous display of a sequence of images in rapid succession. The viewer is forced to judge the dancer as being in a constant apparent motion with a single spin state: (C) or (CC).

- The illusion of ambiguous rotation occurs due to "lack of visual cues for depth"
- It is possible to experience only one judgmental state at a time
- A single perceptual state can have multiple possible judgmental states
- Judgmental states are not consciously produced
- Gestalt switches occur incidentally
- It is unknown what cognitive mechanisms cause a Gestalt switch

Compatibility with Predictive Processing

Clark (2015): Predictive Processing Model (PP). Clark proposes that attention is the intersection of bottom-up residual errors and top-down predictions. Bottom-up processing asserts that perception arises out of bio-psychological constructions of stimuli. Alternatively, top-down processing asserts that the mind constructs perceptual experiences out of preexisting mental states and expectations. The PP model is compatible with my proposal because the processes have a correspondence to sensation, perception, and judgment.



- PP asserts that minds live in a constant state of prediction
- PP serves to explain mental phenomena
- PP is simple and accommodates multiple interpretations of psychological phenomena
- PP is still controversial and requires further testing
- PP is compatible with my proposal

Significance

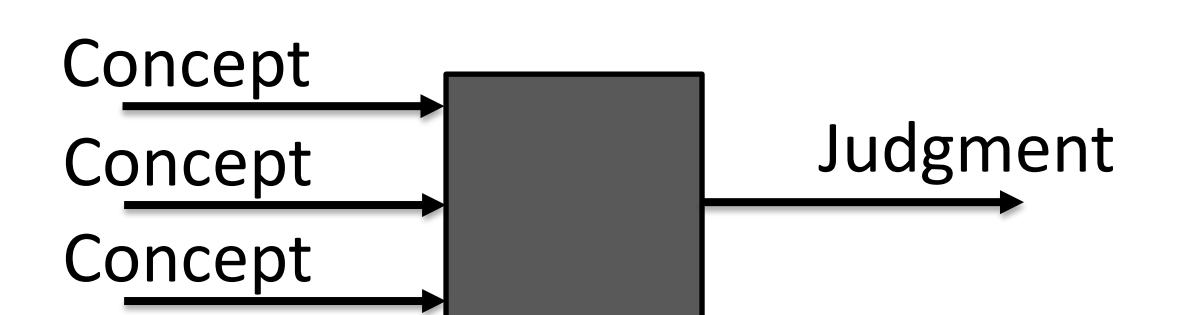
On their own, these processes can be difficult to differentiate due to current limitations of language. For example, the phrase of someone having a *burning sensation* is a vague notion because it can be used to describe the experience of a multitude of things such as the experience of putting your hand on a hot stove, hovering your arm over steam, or the chili peppers touching your tongue. All of these are still subject to their own sensational, perceptual, and judgmental processes, but we typically do not feel the need to distinguish them.

- The distinction between perception and judgment does not impact everyday language
- Distinguishing perception and judgment can change scientific approaches
- A similar distinction is made between weight and mass
- Cognitive science requires creativity to evolve
- Distinguishing perceptual and judgmental processes can help us further understand cognitive states

Future work

Heyes (2018) introduced the terms "grist" and "mills" to differentiate between cognitive products and mechanisms, respectively. More attention needs to be given to the intermediary cognitive mechanism (mills) that precedes judgment (grist) and is subsequent to perception (also grist). This theoretical process would constitute a sequence of conceptual processes and prior-oriented computations that would include the following:

- Logic
- Emotions
- Instincts
- Beliefs
- Motivations



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