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# Causal perception is special and is not similar to how we perceive the color

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## Abstract

We will describe the uniqueness of causal perception in the fields of human psychology and artificial intelligence, and also elaborate on why it is different from simple perception such as color perception.

## 1 Introduction

Before discussing the uniqueness of causal perception and why it differs from simple perception, we need to understand what causal perception refers to. In the field of psychology, causal perception refers to the human ability to perceive causal relationships between events. Causal perception is an important component of human cognition because it can help humans understand and predict relationships between events. Causal perception involves integrating information from multiple sources (including sensory input, prior knowledge, and expectations) to infer causal relationships between events. The study of human causal perception requires the use of advanced techniques. For example, researchers use functional magnetic resonance imaging (fMRI) to study how the human brain processes causal relationships.

Meanwhile, as a course in the field of artificial intelligence, the title of this chapter is Causality. In the field of artificial intelligence, Causality refers to the process of inferring causal relationships from data. Causality is an important element for artificial intelligence (AI) because it contributes significantly to rational decision-making. Causality/Causal inference in Artificial Intelligence is an important concept in the field of artificial intelligence, which can help us understand how probabilities change when the world changes, whether through intervention or through imagined actions.[2]

Causality is closely linked with the basic goal of science, which is summarized by the Greek phrase “Ceteris Paribus”, meaning “all other things being equal”. [3] Scientific laws generate an understanding that allows us to change one variable in a complex system and examine how the system changes while keeping all other variables constant. Discovering, verifying, and measuring these laws is one of the basic goals of scientific exploration. Causal perception in artificial intelligence is a complex process that requires the use of advanced algorithms and techniques. For example, Bayesian networks are a commonly used technique that can help computer systems infer causal relationships from data.

## 2 Why is it special

Causal perception is a special type of perception that involves perceiving causal relationships between events. It is different from other types of perception, such as color perception (the specific differences with color perception will be described in the next section), because it involves perceiving relationships between events that are not directly observable. Causal perception is part of cognition and is closely related to other cognitive processes such as attention, memory, and reasoning. Studies

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have shown that humans are particularly good at perceiving causal relationships between events, and this ability is crucial for many aspects of human cognition and behavior. According to related research, human infants can infer causal relationships by observing the relationships between objects.[4] For example, when one object hits another object, the infant will think that the former is the cause of the latter. Inferring causal relationships is an ability that humans have from a young age, and this ability develops with age. Infants as young as 16 months can infer the cause of failed actions. Infants can use limited information to infer the cause of failed actions, and they will take different actions based on different situations. For example, when they think that the failure is caused by themselves, they will seek help; when they think that the failure is due to the object itself, they will explore other objects. It can be seen that causal perception has a special significance for humans. In the field of artificial intelligence, causal perception refers to the ability of computer systems to perceive causal relationships between events. Causal perception is an important concept in the field of artificial intelligence because it can help computer systems understand and predict relationships between events. Causal perception involves integrating information from multiple sources (including sensory input, prior knowledge, and expectations) to infer causal relationships between events. Causal perception also has special significance for understanding and development in the field of artificial intelligence. It helps to solve the concept of “common sense” using a small amount of data to solve a wide range of tasks, that is, enabling artificial intelligence systems to have the ability to solve various tasks. Related research regards functionality, physics, intentionality, causality, and utility (FPICU) as five core areas of cognitive artificial intelligence with human-like common sense capabilities. When FPICU is a unified concept, it focuses on “why” and “how” questions, going beyond explaining vision’s “what” and “where” framework. These areas are invisible at the pixel level, but they drive the creation, maintenance, and development of visual scenes. Similarly in reference literature, we can also use methods based on causal theory to solve problems in transfer learning. [1]The authors use hierarchical Bayesian structures to model structural causal knowledge at abstract levels and use instance-level associative learning schemes to learn which specific objects can cause state changes through interaction. The model shows performance trends similar to human learners and more importantly shows transfer behavior in different experiments and learning situations.

### 3 Why is it not similar to how we perceive the color

Based on the characteristics of causal perception mentioned in the previous section, we can easily find their differences. The difference between causal perception and color perception is that causal perception involves perceiving causal relationships between events, which are not directly observable. Causal perception requires integrating information from multiple sources (including sensory input, prior knowledge, and expectations) to infer causal relationships between events. Causal perception is a complex process that requires the use of advanced algorithms and techniques. Color perception is a relatively simple process that involves the eyes detecting light waves. Color perception can be influenced by language labels, for example, dividing colors into different categories (such as green and blue) will affect people’s perception of differences between colors. Causal perception is necessary for many aspects of human cognition and behavior, while color perception is not.

### References

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