

Theoretical Model: Perceptual Processes to Categorize Interpret and Cognitive Biases

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Abstract

Many researchers have theorised, researched, and experimented with cognitive biases, and have classified many of them. This list will continue to grow as long as cognitive biases are important in study and assessment. Until these biases were remembered, there were over a hundred seventy-five prejudices, each with its own expertise, kind, and disintegration of parallels and overlaps. The study is an effort to provide fresh theoretical knowledge and interpretations of cognitive biases as they relate to the cognitive process as a whole. Our sensory systems are what keep us informed about the world around us. By using these data, we are able to engage with our surroundings and communicate with people in order to remain healthy, preserve social connections, and avoid potentially dangerous situations. We can't keep up with all of the information accessible to us at any one moment, and even if we could, we'd be overwhelmed. Every day, we'll make a slew of snap decisions by relying on cognitive shortcuts and strategies. Due to the abbreviations, we may make "exact enough" judgements that are often correct. However, cognitive biases are to be expected.

It is possible that I have created over one hundred seventy-five lists that try to depend on cognitive biases (decision-making biases, social biases, reminiscence errors, and many others.). There are a lot of duplicates in those listings, as well as a lot of biases in content with unique names that are identical. As Aristotle became the main to record reasoning errors in a systematic manner, the capacity to refute an opponent's argument has gained importance and looks at since the birth of Greek philosophy. He found 13 logical fallacies in the inferences he made. To far, theoretical research has provided a new understanding of cognitive biases, allowing researchers to classify those biases and, as a consequence, better address those biases in practical research in a way that eliminates the oddity in the way biases overlap.

For cognitive psychology research that integrate cognitive psychology theories into programming and algorithms for robot interaction, this knowledge and categorization is more helpful and easier to implement since it incorporates pc programming.

Keywords: perceptual processes, Cognitive biases, logical fallacies.

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Introduction

Many academics have studied cognitive biases via theory, study, and testing and have classified a large number of them, and this list continues to grow as long as they are critical in studies and assessment. Until the diversity of these biases reached over 175 prejudices, which confounded their information, categorization and the dissolution of similarities and overlaps between them. Does it have a foundation in philosophy after philosophy has provided many examples of logical fallacies and cognitive biases that overlap with one another. As a result, they began looking for a new way to explain cognitive biases, one that included placing them inside of the cognitive system.

We are totally reliant on our sensory systems to provide us with vital information about the world around us. These numbers help us interact with our surroundings and communicate with people so that we may remain healthy, maintain social connections, and avoid potentially hazardous situations. So many data are available at any one moment that even if sensory information is vital to our existence, it's impossible for humans to keep up with them all. In reality, we're only conscious of a small portion of the sensory data our senses collect over the course of the day.

We may make numerous fast and efficient choices every day by depending on cognitive schemes or shortcuts. Our ability to make "good enough" decisions is aided by these shorthand terms. However, we are prone to the kinds of cognitive biases everyone is.

In an attempt to compile as many cognitive biases as possible, I've penned several lists, some of which may total over 175 items (decision-making biases, social biases, memory errors, etc.). There are a lot of duplication and biases in the material that have various titles in these lists. Aristotle was the first to record reasoning mistakes in a systematic manner, since being able to disprove an opponent's argument is one way to win a discussion. This subject has grown in significance and study since the Greek philosophy period. He discovered a logical fallacy, which he labelled as a group of thirteen inference mistakes.

In addition to ambiguity and ambiguity, Aristotle's fallacies include the following: cause and error, multiple questions, and a series of summoning arguments such as the argument using an opponent, the argument using authority, compassion, and ignorance of something. Aristotle's logical fallacies include all of these.

He classified it as either one of two things:

1. Verbal fallacies are linguistic blunders in the presentation of the argument.
2. Physical fallacies are a kind of non-linguistic fallacy. They are a logical mistake in the subject matter the speaker is discussing.

There are two types of fallacies, according to (Hotelli, 1826).

1. Because the inference in them pertains to the introduction, physical fallacies are not considered errors of logic.
 - Ignoring what's needed is a mistake.
 - The confiscation fallacy is a logical error.
 - The myth of the presumed causation.
2. There are debates in which the inference is unrelated to the introduction that are called logical fallacies. They were split up into two categories by him:
 - This is only reasonable.
 - All of the remaining Aristotelian fallacies are included in the semi-logical, or quasi-logical, category.

According to (Ariely), the author of Predictably Illogical, our irrational behaviours are systematic and predictable, not random or pointless. Simply because of how our minds are wired, we keep making the same errors. 1

Cognitive biases are important because they allow us categorise them and deal with them in applied research in a way that is easier to comprehend and interpret since it eliminates uncertainty from the process of overlap between these biases. Cognitive psychology theories and algorithms for robot interaction programmes inspired by information processing systems are more beneficial and easier to apply when integrated with computer programming in studies that examine the relationship between cognitive psychology theories and computer

programming algorithms.

Research hypotheses

1. Our understanding of cognitive biases may be improved by examining how information enters and leaves the brain.
2. A cognitive bias may be categorised according to the three steps involved in the cognitive process.
3. Epistemology is the branch of philosophy that deals with perception and the resulting biases in judgement.
4. Another element of logical biases to be aware of is the fallacy.

Introduction to cognitive bias

Most conventional theories of human perception hold that individuals tend to be idealistic in their thinking when it comes to making decisions and passing judgement. There are numerous sayings in cognitive sciences and psychology that claim that individuals behave rationally but are really acting closer to idealistically. People who are excellent at both fundamental and complex cognitive problems are always on the lookout for new methods to get the most out of their interactions with the people and things in their environment. Since this is a rational factor that weighs the treatment's potential costs against benefits, it helps determine the best treatment option for each patient. This requires considering all relevant information in order to solve the treatment's problem while excluding any unrelated data that could cloud the decision.

Yet in recent decades, data from experimental psychology and allied areas has questioned and refuted the conventional perspective. This suggests that people's judgements and choices are frequently irrational because they are affected by variables that don't seem linked or because they fail to arrive at decisions and judgments that are suitable for the specific person. There seems to be a lack of logical decision-making and judgement when individuals continually fail to obtain sufficient and suitable outcomes in the same issue and with the same error. 3 As a result, a theory is needed to explain this pattern of illogical, consistent judgements and choices, often known as cognitive biases.

According to (Benson, 2019), it took him four weeks to try to comprehend a list of 175 prejudices and put them all to a spreadsheet in an effort to better understand them. He was hoping to come up with a clearer organisational framework to suspend these biases. After that, I used a different approach to removing the duplicates by combining biases that were comparable (such as the inquisitive effect and the humour effect) or complimentary (such as the optimism and pessimism bias). The list narrows down to approximately 20 different, but related, biased mindset techniques. I tried a few various approaches to classifying these about twenty pieces at a higher level before settling on categorising them based on the broad mental issue they were attempting to solve. The primary purpose of any cognitive bias is to save our brains time or energy. Consider them in terms of the issue they're attempting to address, and you'll see why they're there, how useful and what trade-offs (and consequent mistakes in judgement) they make. We may utilise a pattern of cognitive bias to solve four different kinds of issues, according to (Benson, 2019)

1. Information overload.
2. lack of meaning.
3. the need to act fast.
4. how to know what needs to be remembered for later.

Although (Benson, 2019) effort was admirable and inspirational when I read it, the issue that arises in my mind is if these prejudices can be categorised in a manner that is based on internal processes in our brains' functioning, and what is the method of dealing with the problems of the outside world. It's all about perception, and that means looking for ways to classify cognitive biases and understanding them as they manifest themselves across the many phases of perception. According to my findings, cognitive biases can be divided into three categories

based on the stages of perception, selection, organisation and interpretation and there is complementarity and interaction between these patterns. This means that a bias that occurs at one stage can be supplemented by a different bias that appears at a later stage, resulting in an additional form of bias that is actually the interaction and integration of multiple cognitive biases.

The concept of cognitive bias

When the same information is given to us in two distinct ways (for example, favourably and negatively), our choices will likewise vary, according to Nobel Prize-winning academic scholars (Fischhoff, Kahneman, Slovic, & Tversky, 2002) (writers of *Fast and Slow Thinking*). The following question was investigated by these two researchers: What evidence do we have that those cognitive biases influence how well people comprehend and communicate with one another? Because the human memory does not have an unlimited capacity, when we deduce or make a choice, we cannot randomly store huge amounts of information in our minds, as (Kahneman, Slovic, Slovic, & Tversky, 1982) in his book. There is no way for us to handle the whole issue with all of this knowledge, so we must instead concentrate on what is accessible and within our abilities. When it comes to more difficult issues, finding a perfect answer is out of our grasp, and even then, we can only do it within certain logical boundaries. To put it another way, make the best choice based on the facts you have. As a result, many cases of cognitive bias may be explained by this theory. (Kahneman et al., 1982) The Kahneman and Tversky Research Program on Inference provides a framework for studying cognitive biases. This strategy's justification is as follows:

A logical decision cannot or should not be made all the time due to the following factors:

- A. Collecting and installing evidence to address an issue takes time.
- B. Investing in knowledge resources that can be put to other uses is also necessary.
- C. A lot of the time, it's costly and fruitless to try to get close to the best feasible answer (i.e., what's good enough) while still processing to get the optimum one instead. So, whether via the use of rational thought or logical shortcuts, they arrive at a fast and economical conclusion. Rather than seeking a comprehensive understanding of the issue or an ideal solution, this inference process just seeks a "good enough" one that can be achieved fast and with little effort, but it also has the potential to lead to systemic mistakes.

There are two ways that the mind works, according to (Kahneman et al., 1982) dual system theory of human perception. The faster, intuitive, inference-based, instinctive and frugal first system works while the slower, hungry for information resource second system works rationally toward the best answer. A lot of our everyday activities may be performed in this manner since it is simple, fast to solve the problem or approximate (non-optimal) solutions are sufficient. Some job criteria, on the other hand, may trigger the backup system as well.

These cognitive biases have a major impact on the credibility of anecdotal and legal evidence because they cause mistakes in statistical judgement, social attribution, and memory. It's thought to happen as a result of the distortion process of inference's three phases of perceptual processes (selection, organisation, and interpretation). When selecting external stimuli, a bias can occur. When organising information for stimuli that enter the perceptual system, deviations can occur as well. There can also be deviations in the interpretation of information and the function of meanings that do not match the stimuli's origins. Complex deviations occur when information is interpreted, and function meanings deviate from the stimuli's origin.

Behavioral biases that affect the way we think

Every time we engage with the outside physical world, we have to deal with the information that comes from it in order to make sense of it and be safe and sound. Since our sensory systems enable us to perceive the outside world via hearing, seeing, smelling, touching, and tasting, we may say that we sense this world and stay alert to what is going on in it. Despite the fact that sensory receptors are continuously receiving information from the environment, it is our interpretation of that information that ultimately determines how we behave in relation to it.

Cognitive bias as defined by the study's author

For the sake of argument, I will use this definition, which I believe is the best fit for the notion of cognitive bias. If you have cognitive bias, you have a set of systematic (not random) aberrations in the processing of information entering the cognitive process that led to a logical fallacy, which distorts the treatment's output. This leads to cognitive bias because of the logical fallacy, a person's perception as expressed via judgements or choices Cognitive biases are divided into phases, each of which corresponds to a different kind of prejudice. When we look at the description of cognitive biases, we see the following additional element of what we know as logical fallacies:

It is a logical error when the information entering the perceptual process is processed in a way that inhibits the process of good logical thinking and results in erroneous information being outputted. According to the phases in the perception process, cognitive biases may be divided into three kinds, and the patterns of biases that occur at each step will be shown below.

First, selection biases

There are innumerable stimuli in the world around us, yet our brains are overburdened and cannot cope with them all. To come to terms with this, the first thing to do is decide what matters and what doesn't. We may pay attention to a familiar sensory input or something new, depending on the situation and on each of us individually. It's the selected stimulus - whether it's a scent, a sound, or anything else - that becomes the initial step in the perceptual process when we're in front of it. To put it another way, we turn external stimuli into information that the brain can interpret. The words we hear, listen to, look there, what's that scent, the colours, the room temperature, etc., bombard us with information every day. There are a select few. There are an infinite number of impulses hitting our sensory organs at the same time, all of which must be processed concurrently. However, we are not able to perceive all that is going on around us, and this is the extent of our perceptual abilities. As a result, we only see a fraction of the information that is accessible to us in the environment. And (Singer, 1987) has made this observation. "We don't see things as they really are; we only see them as they seem to our sensory receptors." 6

When confronted with a large number of conflicting stimuli, we selectively focus our attention on those stimuli that we are familiar with or are interested in. This is an example of cognitive bias, and it fits into a larger pattern of biases known as choice biases. A helpful bias helps us make fast choices that can't wait, while a choice bias causes us to ignore cues and information that were available in the circumstance but are more relevant to us in future cognitive treatments. We may incorporate a number of cognitive biases, referred to as selection biases, inside this pattern. A list and classification of the causal factors are possible.

determinants of selection bias

As a starting point, there are the physical factor biases.

In choosing a stimulus, physical elements, such as emotions that convey information to us, whether correct or muddled and distorted, and comparisons between stimuli for inclusion in the treatment process, all influence the bias in our decision. Time You had a bright light beaming in your eyes, your buddy next to you was venting about his issues with his brother, and it was a very cold winter day. All three of these things happened at once. When individuals wake up from sleep, around noon, or at the end of the night, they get sensory signals at different times of the day. When it's early in the morning, a person's overall health influences their bias in selecting stimuli. This is different from those who go about their lives at night.

There are many external variables that influence the selecting process, but the following are the most significant:

1. The stimulus's physical characteristics, such as colour, shape, size, intensity, and placement against a backdrop, as well as movement, change, structure, and arrangement, are all examples of stimulus attributes. Vibrant colours and loud noises catch our attention more

- than dull ones, and strong fragrances intrigue us more than subtle ones.
2. stimulus intensity fluctuation: stimuli with a constant intensity do not attract attention, thus stimulus intensity fluctuation helps to attract attention.
 3. Newness, modernism, and strangeness in stimuli: known stimuli do not attract attention since the person has grown used to them, whereas new or unfamiliar stimuli quickly grab the individual's attention.

The second factor, Motivational state biases

The feeling is a physical, physical process, whereas perception is a mental-psychological one. Often the choice is influenced by a person's motivations or motivations to behave in a certain way. Many other stimuli and stimuli are distracted when a person is dealing with intense urges that must be fulfilled right now. Choosing one stimulant or stimulus over another is a bias, since a person selects one over the other based on a psychological need or motivation. As an example, consider the following scenario: Walking to the kitchen and smelling cinnamon apple pies (students) activates your scent receptors and gives the impression that you're about to eat something while in reality you're just passing through.

As we discovered with the desire for food, psychological needs and motives have a significant impact on the cognitive bias process.

A hungry person will be drawn to the scent of cooking food, while a person who is full will not be. The stimuli that capture our attention are influenced by our long-term desires as well. A building engineer, on the other hand, is more likely to focus on the column structure supporting the building than an art historian who has dedicated their career to researching visual art.

Dimension Three: Values and Belief Systems Illustrate why we may pay attention to some stimuli but not others because of a selective selection bias. Most of the time, it seems that a person's personality traits including culture, attitudes, inclinations, and beliefs have a significant effect on how he responds to stimuli and how he interacts with the outside environment.

It's cognitive bias that's at play when someone chooses one stimulus over another because it's in line with their particular belief or trend, and that belief or trend leads them to choose that particular stimulus.

Here's an illustration of what I mean: It's likely that if you go to Europe and stay in a city where buildings combine to create a beautiful park and a basin for dancing water jets, you'll hear the call to prayer from a mosque nearby that you can't see, as well as the smell of rice and value sauce, and you'll wonder where it's coming from because of your curiosity. Your ideas and attitudes are influenced by the stimuli's selection bias.

The fourth factor, Mood: As a result of your emotional state and mood, you may be more likely to choose some stimuli over others, or to choose something else instead of the stimulus itself. According to (Kahan, Peters, Dawson, & Slovic, 2017), certain cognitive biases may be caused by emotions and emotions. Emotions are often omitted from the logical decision-making process because they may taint the findings. This is the way decision-making works in regular situations. 7 This may explain a large number of cases of decision bias caused by emotions. The decision-making process deviates from the logical context and from the rules of possibility and utility theory in the cognitive processing process. In our everyday lives, we hear things like these, like the phrases (I will turn green and everything and on me and my enemies). When you're enraged, you may not notice many of the cues around you that might help you relax. You have a cognitive bias that affects the input of your perceptual process when you are angry. You may also not pay attention or ignore errors made by others while you are overjoyed.

Factor five, Selective Focus Bias: A test bias is the ability to selectively concentrate on one stimulus while filtering out a large number of competing ones.

At a noisy party where music is playing and people are chatting and shouting, imagine yourself in the middle of a good discussion when someone interrupts you to ask about the song that just finished playing. You will probably be unable to answer this question because you have chosen to ignore the background noise by setting a conversation alarm and deleting all background noise information. 8

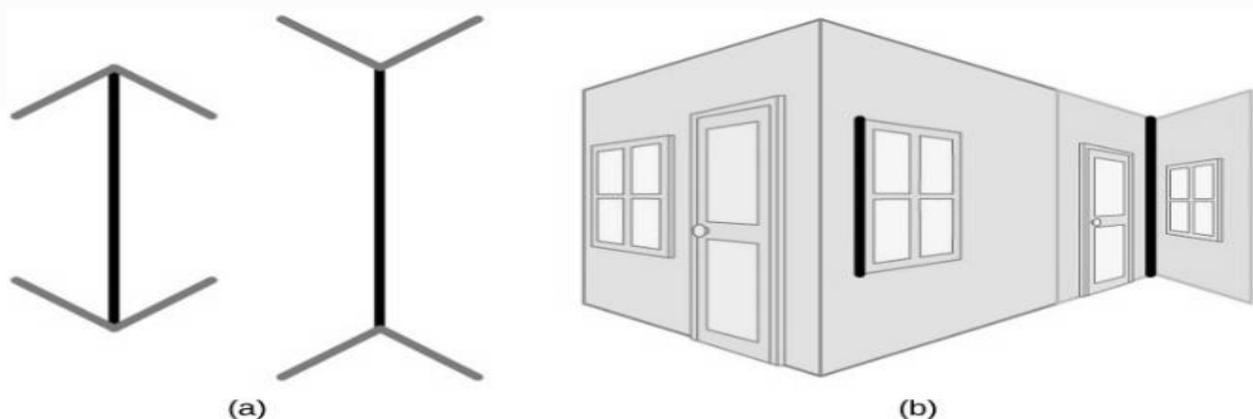
However, not all sensations lead to perception, even if they constitute the foundation of human experience. We often overlook the fact that stimuli are very stable over extended periods of

time. Somatic adaptation is the term for this process. Think of walking into an old mechanical clock in a small seminar room. When you first enter, you can hear the ticking of the clock. However, as you begin a conversation with your roommates or listen to the lecturer give a presentation, the ticking of the clock is no longer familiar to you. However, that information still affects your auditory system's sensory receptors. Selective bias is evident, and clock sound is no longer being used in the perception-processing process.

In another case, he presents one of the most intriguing examples of selection bias that exists. Researchers (Most, Simons, Scholl, & Chabris, 2000) found in a well-known research (1999). Participants in the experiment saw a video of individuals dressed in black and white basketball jerseys while they were taking part in the research. Participants had to keep track of how many times the white ball was passed by the other team. Someone dressed as a black gorilla moves between the two teams throughout the video. Do you honestly believe no one would pay attention to the gorilla? Despite being visible for nine seconds, the gorilla was missed by almost half of those who viewed the film. Due to the participants' intense concentration on how many times the white team passed the ball, other visual information was precisely calibrated. A lack of focus causes inattentional blindness, which is the inability to see things that are clearly visible. Using a computer screen to show moving pictures, the researchers investigated whether or not individuals might become blinded by accident. They were instructed to pay attention just to white or black objects, and to ignore anything else. About a third of individuals missed the red cross when it appeared on the screen. As a result of these biases in cognitive processing, people are prone to things like selective attention, perception adjustment, and even blindness.

The sixth factor, social status: the person's actual or perceived status in society or in an organisation that forces him to deal with stimuli and stimuli, particularly in regard to the social interaction, in a selective way that shows an obvious bias in selecting and processing stimuli while ignoring other stimuli.

The seventh factor, selection bias according to life experience: Culture has the power to shape perception because of the common experiences of those who live there. It was shown that people from city-dwelling cultures were considerably more receptive to reactions to a particular kind of visual illusion than those from tropical forest-dwelling civilizations in Africa, and the opposite was true. Right. For example, the Müller-Lyer (Fig. 1) illusion makes lines seem longer than they really are, which is common among city residents. Culture has the power to shape perception because of the common experiences of those who live there. It was shown that people from city-dwelling cultures were considerably more receptive to reactions to a particular kind of visual illusion than those from tropical forest-dwelling civilizations in Africa, and the opposite was true. Right. For example, the Müller-Lyer (Fig. 1) illusion makes lines seem longer



than they really are, which is common among city residents.

Figure 1. Müller - Lyer illusion: although being identical, the lines seem to have different lengths. While both lines have the same length, arrows at the ends of one make it seem as if it is longer than it really is (A). (B) Even though both black lines are the same length, the line on the right may seem longer when applied to a hologram.

Different kinds of environmental characteristics that individuals frequently live within a given culture were consistent with these perceptual differences. Those living in western cities, for example, have a preconception of straight-line architecture as the "carpentered world,"

according to (Segall, Campbell, & Herskovits, 1966). People from Africa's tropical forest dweller tribes, on the other hand, have a viewpoint. This illusion is less likely to occur if you have an eccentric vision of the world, where communities are made out of round cottages organised in circles. 10 Cultural differences impact more than simply eyesight. According to the findings of many studies, people from different cultures have different abilities when it comes to detecting and evaluating scents. As opposed to what some scientists in this area thought, selection bias is based on how a living system and a cultural system interact to find the best way to cope with the environment. Culture or living systems, in my opinion, need more investigation and study in order to provide helpful insights.

The seventh factor: Stimulus selection biases may be caused by a person's fundamental or unique personality traits. SEEKERS, like ecstatic youngsters, have a stronger affinity for very acidic foods. 11 Furthermore, those who have a favourable attitude toward low-fat meals are more likely than those with a negative attitude to say that low-fat foods taste better. In the direction of these items.

Second, Organization biases

During the second stage of perceptual processing, we begin to perceive physical and social objects and events in terms of their attributes such as form, colour, texture, size, etc. People may describe him from the viewpoint of their skin colour when he inquiries about what a person is, while others may describe him from the perspective of their race or nationality. Differences between individuals, their behaviours, and their distinguishing characteristics. 12 It's necessary to arrange the information once it's been collected from the outside by looking for significant patterns that can be quickly processed. Some academics refer to this level of organisation as categorization since it is achieved via the classification of objects or persons. When we choose (consciously or subconsciously) to pay attention to anything in the environment, it sets off a series of events in our brain. The sensory receptors in the body are activated to begin this nerve process (touch, taste, smell, sight, and hearing). We create a mental picture of an external stimulus (or in most instances several external stimuli) termed perception in our brains using receptors that transform input energy into nerve activity. "Metastable perception" refers to the process when various interpretations of the same input are made and then evaluated at random. 13

In ambiguous sensory information, metastable perception occurs when the brain automatically switches between two or more perceptual states. As a result, polymorphic phenomena have been extensively utilised to investigate the neurological correlates of consciousness because they separate brain activity linked to conscious awareness from that connected with sensory input. 14 Treatment preferences and categorization are influenced by regulatory biases created by ambiguity in sensory information and the alternation process between more than one cognitive state. When it comes to categories that are more closely tied to the stimulus's features.

Factors for regulation biases

The first factor: Psychologists use Gestalt theory to describe how people naturally see inputs as structured into patterns and groups. We can get a better grasp of regulatory bias by looking at how these laws work.

Gestalt grouping rules. It was originally suggested by Gestalt psychologists that the way people naturally see inputs as patterns and ordered objects is explained by Gestalt rules of grouping. It is the goal of gestalt psychology to discover the rules by which we acquire and retain meaningful perceptions in the midst of a seeming chaotic universe. Gestalt psychology is based on the idea that the mind is a self-organizing system that creates a universal unit. This phenomenon is known as the Gestalt effect and is caused by our brain's capacity to create full meanings. In order to better understand and interpret organisational biases, we can apply Gestalt theory's concepts and rules. Rather than seeing the forms of cognitive biases in a particular issue and counting them as mere groups of Spare, simple, and irrelevant cognitive processing processes, we find that according to Gestalt theory, our brain organises and combines the various cognitive processing processes. A few examples of these grouping rules are the laws of proximity, similarity, and closure: furthermore, there's the rule of base 10. 15

The law of proximity

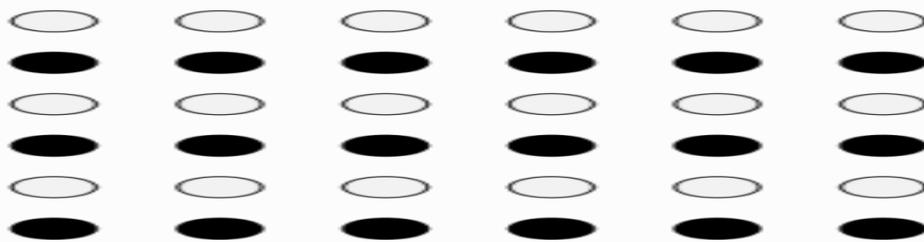
When we experience a collection of things, this rule implies we will process items that are physically near to each other when we feel them. As a result, objects may be grouped together into bigger ones, which lowers the number of tiny stimuli that must be processed. So instead of seeing a huge number of individual dots on a page, individuals perceive clusters of them. We can comprehend and perceive information more rapidly because the brain combines tiny inputs instead of processing huge quantities of them. ¹⁶



People are more likely to notice clusters of dots on a page due to the law of affinity than they are to see a huge number of individual dots.

Law of Similarity

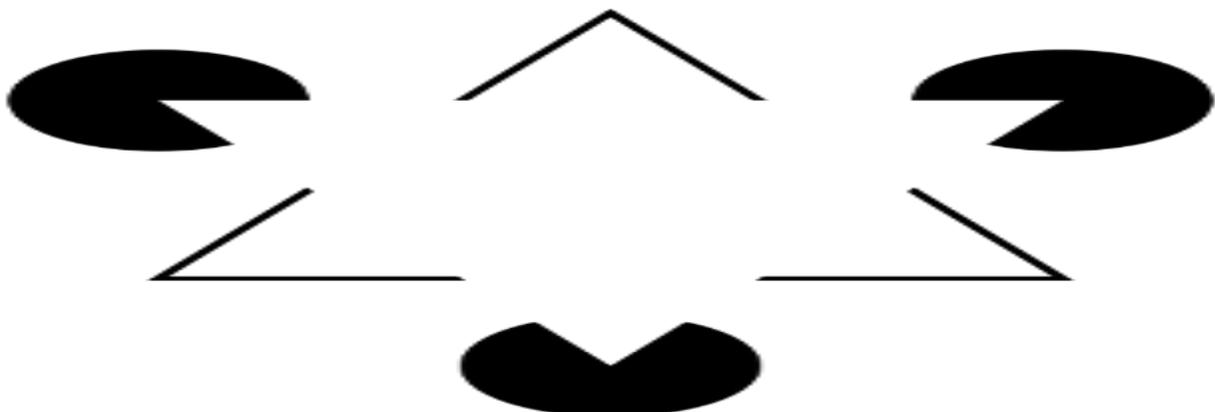
According to this rule, individuals will group together like things if they believe them to be comparable. The visual texture and resemblance of items may help us tell between those that are nearby or overlapped.



Most people perceive this as six clusters of black and white dots due to the law of resemblance.

Law of the Earth Form

Objects that stand out in the visual field are called forms, while those that blend into the backdrop are called grounds. This perceptual orientation is the basis for a slew of optical illusions."



Because of the Law of Shape and Earth, most individuals see a white triangle in the front while looking at the (Kahan et al., 2017) Triangle Illusion. This causes the black shapes in the background to fade away.

Lockdown Act

For example, as seen in the picture below, the Closing Law shows how our visualisation will match the incomplete components.



The closure law governs the operation of the circuit and square line.

The second factor, Various parts of the brain process different kinds of sensory input, which is why the human brain is so standardly constructed. Our brain's fusiform face area (FFA) has been specifically designed for the purpose of recognising and categorising individuals based on the biases that govern their distinguishing characteristics from the perspective of an individual. This unit was created to meet the human desire to get to know others and classify them in order to better our chances of surviving.

Factor Three, our proclivity for grouping stimuli allows us to control our emotions more quickly and effectively, but it may also lead to erroneous interpretations.

The fourth factor, we may use perceptual diagrams to better organise how individuals form impressions depending on factors such as appearance, social role, and interaction, among others. Stigmata may be defined as preconceived ideas about people or groups based on the knowledge they have in common. As a way to make complex information simpler to understand, stereotypes group similar objects or people together. This makes it easier to identify, remember, anticipate, and interact with the information. Things and individuals defy preconceptions by being as different as possible. Things and people in stereotypes are made to be as similar as possible.

As much as our proclivity for grouping like stimuli is beneficial for managing our emotions, it may also lead to erroneous impressions. To be harmful, stereotypes must mirror reality or be applied to whole groups of people without regard to individual differences. As a result, it has the potential to engender hostility, discrimination, and repression. The perceptual framework we employ to arrange our perceptions of individuals is known as psychological categorization systems (appearance, social roles, interactions, habits, etc.).

Using these diagrams, we may better understand how we see other things in the environment because of how we arrange people's perceptions based on their appearance, social roles, and interactions, among other things. These graphs serve as conclusions or shortcuts for the account, saving both time and effort. For instance, you may believe that the building you attend to in class appears symmetrical from the outside in your perception scheme. (Sometimes called "symmetry inference" or the tendency to remember things as more consistent than they are). Although it's unlikely, making that assumption has saved your sanity on occasion. Diagrams and inference have the advantage of helping us comprehend a complicated environment while also having the disadvantage of being inaccurate. Classes of items or phenomena are organised in a system according to the reciprocal connections that exist between them, and this organising process is a set of mental processes that the brain goes through while it's looking for significance:

1. In contrast or balance, it is referred to as a comparison, and it is seen in the connections and correlations between phenomena, things or events, and in perception and perception of man's extraction of these phenomena, things or events.
2. Objects or phenomena are classified according to what sets them apart from one another, and where grouping or classifying is put in place, and thus it contains particular ideas of phenomena or things are included in the classification process.
3. For thinking to be realised, it is done independently of the objects themselves by identifying the independent characteristics of things.
4. In order to determine the abstract properties of objects, thinking must have taken the form of generalisation. This is where abstraction and generalisation intersect.

5. It is necessary to return the mental process of abstraction and generalisation to sensory reality before one may have a proper grasp of the actual world's conditions.
6. To decode a complicated total phenomenon into its basic parts, that is to say, to its partial components, one must use logic.
7. To synthesise is to go backwards from the analytical process, because it's a mental activity that reunites the disparate parts of a complicated event.
8. It is possible to deduce the validity of one judgement based on the validity of other judgements. By using sound reasoning, one may come to trust that the conclusions obtained are necessary and inevitable. There are two kinds of inferences: inductive and deductive. (Varner & Beamer, 2011)

A.Deduction: Our reasoning comes to this conclusion because of the inferential procedure we use.

B.Induction: A general conclusion may be drawn from the observation of specific partial situations through the inferential process.

The fifth factor, exterior factors (objective) linked to external stimuli influence how a person perceives stimuli, events, people, and phenomena because these factors guide the individual's attention and perception in accordance with certain variables. Affiliation may be intuitively stated in the following way: "If A resembles B (or is a member of group B), then A will perform similarly to B. After then, all characteristics typical of the group are assigned to the model since it is seen as a representative. Let's take someone who studies at a university or wears glasses as an example of someone who is clever. These results suggest that addressing Bayesian reasoning issues, such as ignoring the base rate, may lead to mistakes. (Blanco, 2017)

Third, Interpretation Biases: The interpretation or translation stage occurs as the last step in the perceptual process after we commit to a stimulus and our brains receive and arrange the data. Using categories of information, we categorise and then interpret inputs rationally to give them meaning. Meaning that interpreting merely implies classifying information that was structured in a prior step so that it may be used to attach meaning to a particular stimulus or stimuli as an output. However, various individuals will perceive the same input in different ways. There are some who see sensory information as "vases" in the Robin Vase Illusion, while there are others who see "faces." This is an example of an erroneous reading.



Using a robin's vase is a popular visual trick for demonstrating how people see stimuli differently. (Haselton, Nettle, & Murray, 2015)

For things and material events, almost everyone agrees on their objective meaning; however, social events are a different story because each person views them as unique situations based on their prior experiences and cultural background, so differences appear in the perception of the same stimulus among people of different backgrounds. Also, people from similar cultures will have a repository of similar experiences and knowledge in terms of values and customs, so they may attribute similar meanings to the same motivation, and this means similar perceptions, so the process of understanding and conveying the precise meaning of verbal and nonverbal behaviours to each other... (Blanco, 2017)

Because interpretation biases are formed at this stage of the perceptual process, using interpretation as a means of imparting meaning to the stimulus offers benefits that must be taken into account. :(Ariely, Loewenstein, & Prelec, 2003)

- Interpretation of stimuli is subjective, thus different people will interpret the same stimulus in various ways.
- Stimuli are interpreted by the individual in light of his or her own expectations and perceptions of those expectations.

- It's a multidimensional construct that relates to a person's sense of "self" in relation to a variety of qualities, such as academics, social roles, gender and ethnicity, among many other things.
- Our representation and comprehension of stimuli in our surroundings define this stage, since it represents what we term an individual's viewpoints on the world.

Bias in cognition has a role in interpretation

These variables have a significant impact on cognitive processing patterns. They are active contributors to the creation of cognitive biases and to the creation of an individual's distinctive final appearance. For each individual to understand environmental cues and the meaning associated with them. People perceive stimuli differently depending on their level of experience. ([Hastorf & Cantril, 1954](#))

For example, the elderly has a different perspective on life since they can cope with the world and events in a more mature way than "youth and teenagers. They have various levels of expertise, as a result of which their interpretation bias differs. prejudice based on accessibility The ease with which something may be mentally represented affects the availability index. Sure, a hint exists, but it's almost certainly wrong. A well-known example is when people exaggerate the likelihood of an aircraft accident after seeing a movie about it. There are numerous biases that may be explained using this reasoning. For example, there is a recency bias, which refers to information that is readily recalled and thus is given more importance than other information (for example, judicial).

The kind of cognitive bias used to evaluate information may be influenced by a person's aspirations and expectations regarding the stimuli. The development of interpretive biases may be explained by looking at the advantages that come along with it. It is possible to identify interpretive biases when faced with time constraints to make life-or-death choices swiftly in accordance with the error management theory

It's preferable to flee when you notice a possible predator than to wait until it's visible but may be too near to see before you try to get away.) Due to these circumstances, decision-making processes that function rapidly and generate the so-called "least-cost mistake" are more likely to emerge. Rather of assuming the surrogate is the predator, it's preferable to incorrectly assume that it isn't present in the surrounding environment, implying there is no predator. Both errors have quite different outcomes (it may be a waste of time in one instance and lead to death in the other.) so we know this. ([OpenPSYC](#)) Even though a mistake is cheap, that doesn't mean it will happen. This bias tends to favour the result that has the lowest cost of mistake and can be stated using any of these techniques. Selection bias is how we categorise and interpret information in ways that favour certain groups of people or ways of looking at things. As a result, selective perception is often seen as a type of information processing bias. It's more like people tend to interpret information selectively based on what they now need or want or value or believe. Most of the time, this happens on its own, without any input from the user. ([OpenPSYC](#))

Heuristic disclosure may take many forms. One example is the fixation and modification bias. To have some idea of an answer to a question may affect how other people answer the question (these answers become closer to the anchor). Consider answering the question, "What year did Albert Einstein first come to the United States?" Assume you're speculating because you don't know the answer. If you want to choose a number that symbolises a certain time period, most people will go with "1950." If you were given the choice between two answers and asked to indicate the year within one of the following two cities (1200-2000), what would your response be? (1900-2000). Those who stated a range of 1900 to 2000 answered with greater numbers than those who said a number lower than that. This shows that each group's members provide a response to the question of how much they regarded (the anchor) while making their decisions. Consumer behaviour has been widely researched in relation to the impact of a brand's anchor or institution. There are several ways to influence how much money individuals are ready to spend for various things, including making them think about the last number of their Social Security number. This may be done by using arbitrary numbers (such as the last four digits of someone's Social Security number).

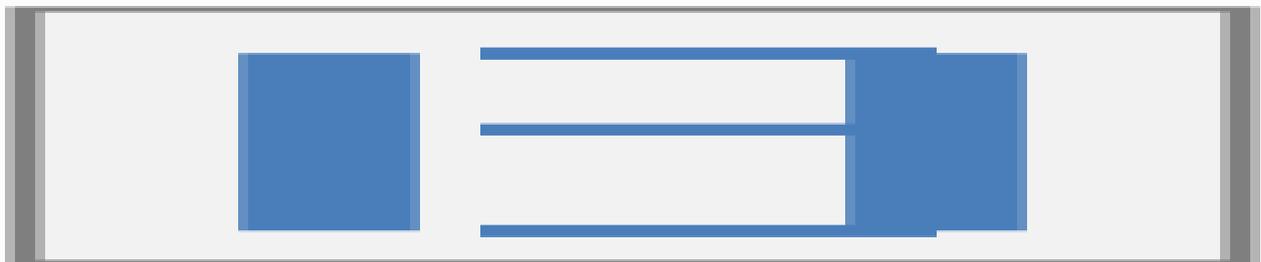
In a similar way, selective memory (also known as selective retention bias) preserves and stores certain information in memory (and therefore is retrievable) while discarding other information (and therefore forgotten).([Sullivan, 2009](#)) This is a bias in interpretation that happens

unconsciously. Using just certain pieces of information in future information processing procedures in order to tailor the result to the user's preferences. It's like someone who keeps you as an orphan and doesn't remember your nice acts, so he treats you unfairly because of your one transgression with him.

Fourth, Cognitive processing scheme: Because perception is a personal experience, it is shaped by the qualities of the person who has it.

As a result, by organising and interpreting information based on prior experience and knowledge, the chart aids in the development of precise perception. When we talk about perception, we mean how we consciously arrange, analyse, and experience our perceptual information. Between sensation and perception, there are often two processes at play:

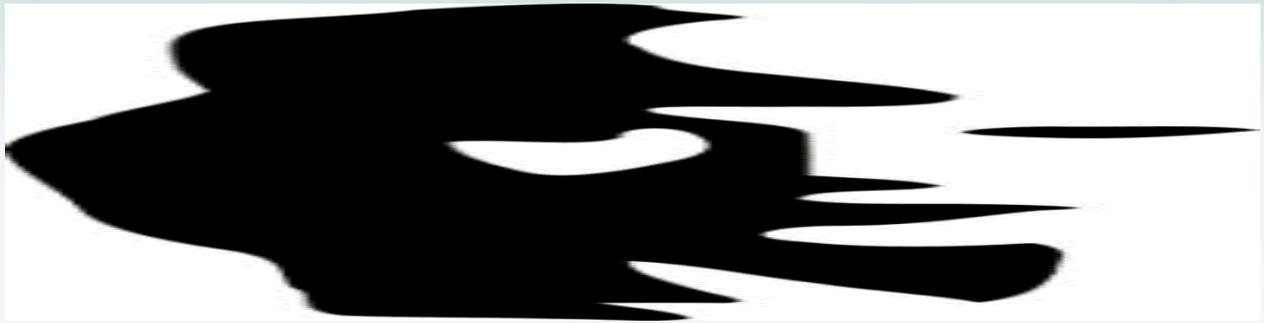
1. To construct perception, a mechanism called bottom-up processing processes information as soon as it comes at the brain's receiving end, from the bottom up. That is to say, your eyes notice the characteristics of a random picture on the screen, your brain puts them together and you perceive an eagle image. What you perceive is just a function of the sensory data that enters your brain. A technique known as ascending starts with the tiniest bits of sensory information and works its way up. Selecting the stimulus as an input to cognitive processing involves cognitive biases, so why is one stimulus present but not the other? The answer to this question is a selection bias process.
2. Top-down processing is a term used to describe the way our brain processes sensory information. When it comes to guiding our emotions, it's a system of influence that takes into account our current state of knowledge, past experiences, and current beliefs. Your brain fills in the gaps based on what it already knows and what it expects to see. Cognitive biases arise when our information, experiences, beliefs, and psychological state influence and direct sensation. As the perception process renews owing to selection bias affected by interpretation bias, which produces bias in the organisation, these biases reflect the interaction between the three entry points. They return and interpret based on this complicated treatment. Let's have a look at an illustration of what I mean:



Try looking at the square figure by yourself, and you'll see that your brain is working on it from the bottom up. It's divided into four sections by two heavy vertical lines and three thin ones. No top-down processing occurs since there is no context for it to have any particular significance. When faced with a choice between many options, people are more likely to choose one over the others due to cognitive bias. Then take a look at the same form in a new light. When a form is surrounded by letter strings, your brain automatically completes the sequence. The lines form the letter "B" when seen in this way. As a result of the shape's surrounding digits, it now seems to be "13." Your perception is influenced by your cognitive expectations when context is provided. From this point on, you'll be working your way down the form.³⁰



For example, your initial option was a sequential character pattern, but your second choice was a sequential number pattern, all while your perception was skewed due to cognitive bias. Here's one more top-down processing example. Take a look at the image below.



There should be a smattering of random dots in the picture above. Faces, from a biosocial viewpoint, are among the most significant stimuli in the world, and our brain is involved in recognising them. We can construct a nose and a mouth out of the floating-point point, which tells your brain that this is what it's meant to perceive. From there, it figures out that the picture looks like a "face" and tells your brain as such. Instead of seeing a person's face, the picture now depicts a saxophone musician with a huge hat. This may have been obvious to some of you from the beginning. In other words, there was a cognitive bias at work. When we don't detect a cognitive bias in our mental processes, it's just a smear of ink.

This interplay and overlap between different treatment biases may be shown by the following example:

1. Biases in perception based on expectations and assumptions about the world are known as perceptual expectation biases. The person frequently ignores other cues when he expects something to happen and concentrates on the sensations connected with his expectations. Willingness to see things from a certain perspective.
2. selective exposure bias is the propensity of people to favour information that supports their pre-existing beliefs while avoiding information that is contrary to those views. The term "confirmation bias" refers to selective exposure. People, according to the term's traditional meaning, tend to focus on just a small portion of the information given to them, disregarding the rest. According to the cognitive dissonance hypothesis, when people are confronted with opposing concepts, certain mental defence mechanisms kick in, resulting in a cognitive balance, which is described as a condition of harmony between new ideas and preexisting beliefs. The harmony that exists between a person's mental picture of the universe and the actual reality around them is called "environmental harmony." It is founded on the premise that even after taking a position, people would continue to look for knowledge about a subject. A person's decision-making process will be coloured by a variety of issue variables that are reinforced. You're in the shower, and you hear what you believe is your phone ringing, only to discover that it isn't? It was only after testing that it became clear that the difference between a significant stimulus and background noise was no longer discernible. Signal detection theory refers to the capacity to recognise a stimulus in the midst of noise or other distractions in the environment. This may also explain why a baby's murmur awakens the mother, but no other noises do so when she is sound asleep. The theory of signal detection has real-world applications, such as improving air traffic control accuracy. To keep track of aeroplanes in the sky, controllers must be able to distinguish between the different signals (flashes) that show on their radar screens. The researcher who came up with the idea of signal detection first set out to make air traffic controllers more sensitive to flying bullets.
3. Lack of clarity prejudice: ambiguity bias. If the level of ambiguity rises, the individual may have trouble comprehending the information. Cognitive bias is present at many stages of the cognitive processing chain in this case. There are two options: the person ignores the stimulating alarm and moves on to another, or the person chooses the mysterious alarm and treats it with bias, organising and categorising it in a way that does not suit him, and then bias in its interpretation according to variables that fit the person's characteristics rather than the stimulus's characteristics.

Conclusions

1. Processing information from the senses at various phases of the perception process helps

- identify, understand, and explain cognitive biases.
2. There are three types of cognitive biases, each corresponding to a different step in the information processing process (selection, organization, interpretation). Each stage's assumptions about cognitive bias have been deduced, and the biases interact as they go through the process.
 3. Cognitive biases are sometimes referred to as logical fallacies.
 4. People's choices and judgments in a broad variety of fields and activities may exhibit cognitive biases.

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