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Confirmation Bias and its Significance

Naresh Kumar

Independent Researcher, India

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ABSTRACT

Have you ever thought why after having a video chat with our small grandchildren on WhatsApp, we frequently see small kids walking with parents on the road, why our eyes often see wedding destinations while travelling in a car after we have just bid farewell to our daughter after her marriage; why do we often see a brand of car on roads after we decided to buy that brand?

All these happen due to 'Confirmation Bias'. Our brain is so wired that given all information, it picks only those which support our belief system and the rest information is ignored.

We shall explore this queer act of our brain in this paper and shall research the meaning of confirmation bias, its types, its history, its causal roots, its significance...

You will agree that this is a very interesting subject!!

Keywords: Confirmation bias, Mind and its aberrations, Pareidolia, Our biases,

How true is the quote from Ina Catrinescu- "Confirmation Bias" is our treasured enemy. Our opinions, our acumen- all of it, are the result of years of selectively choosing to pay attention to that information only, which confirms what our limited minds accept as truth.

Over the past years of life, we accumulate experiences which build our belief system and our mind continuously filters out to reject the thoughts which go against the belief system. Not only that it strives to search out and treasure only those thoughts which support the inbuilt beliefs. This is true for most of us. And this is "*Confirmation Bias*".

Confirmation bias manifests after we have built some strong beliefs in our mind. I narrate incidents of my life which built the belief that ghosts exists and we can see them. I did not realize that this belief finally resulted in confirmation bias.

As a child, I was always curious about things which baffled mankind. I had my first such experience when I was six years old:

When I was hardly six years old, I underwent an incident that was not only very bizarre but also strengthened my belief that ghosts exist.

We were visiting a family friend's family and at their house, suddenly it appeared as if some invisible entity pushed my hand to push a glass lying on the table to fall on the ground and shatter to pieces. I was looking around for the invisible entity but could not find it and in that startled mode, fear appeared on my face. My mother and others thought that I was trembling because of my mistake of toppling the glass tumbler and was afraid of getting a punishment but the thought of punishment had never entered my mind; I was terrified thinking about the invisible push that I had got. My mother approached me to console me but I retreated away from her. Everyone thought that I was getting scared of her as she was wearing a black sari but this was not the case; I was afraid that maybe that invisible entity may harm my loving mother also so I should move away from her. The startling incident ended in a few moments and I suddenly became a normal self and forgot the incident and started playing with other children. What was that invisible entity that pushed my hand? Was it a ghost? I grew up hearing the stories of ghosts, which made me think about life after death.

The belief of life existing after death went on becoming stronger and that led to our "Ouija Board" sessions at night at our hostel during my post-graduation days at Indian Statistical Institute, Calcutta. We were fascinated with an eerie feeling when one discarnate spirit 'Tandra Das' appeared to communicate during the Ouija Board sessions. 'Ouija Board' is a board having printed alphabets 'a' to 'z' in and digits 0 to 9 at the circular circumference periphery of the board. At the centre of the board is a circular red patch on which a coin is placed during the Ouija session. At the left side of the circular patch the words 'YES' are printed and at the right side are the words 'NO'.

Ouija sessions were conducted at night when a group of students joined together to communicate with a discarnate spirit. Each of the gathered students put a finger on the coin kept at the board and closed his/her eyes and concentrated to call the discarnate spirit. We found that after 5-6 minutes of concentration, the coin touched by our fingers started moving freely on the board. This indicated that we had established contact with a discarnate spirit. We asked the spirit whether it was present amongst us and in response the coin freely moved to the words 'YES'. Later our communication was as

questions from the participants which could have answer as yes or no and the entity which was with us i.e., Tandra Das used to give answer by pushing the coin to yes or no printed on the board. The questions which warranted an answer as a sentence was answered by sliding the coins to alphabets to create the words and sentence. We were all thrilled to grope into the life of discarnate spirit when she was alive and also had glimpses of how she was living now after her death. Each of us curiously awaited the night sessions which were full of thrill with the company of Tandra Das. As brilliant students, we were serious about our studies as well so the sessions were few and distanced over time but whenever we had the mysterious sessions we were thrilled in the company of the same spirit Tandra Das.

Many years after we all dispersed and got busy in our professional lives some of the participants happened to gather together at Calcutta and then one of them, a friend of mine, Mr Tapan das Sarkar exploded a bombshell by revealing that it was he who was pushing the coin to answer the questions and Tandra Das was his imagination. We all felt as if we were thrown into an abyss!! We believed what we intended to believe and the thought that this could be a fraud never entered our minds. We were a victim of “Confirmation Bias” towards our belief that ghosts exist!!! I did not know about this bias then, but today after I am aware of the fact of brain fooling us, I am amused as to what extent we can get carried away with our inbuilt confirmation bias.

I narrate one more such incident before I begin exploring the topic of the paper “Confirmation Bias and its Significance” which will explain the meaning of the above phrase, how it originated, its history and how it gets generated in our mind, what it does and lastly what is its significance.

But first the experience:

I remember on February 23 2018 at 3 p.m. when my father died and I came out from ICU after learning about his death, I could see my mother for a few seconds, sitting in the area where ICU patients' relatives were sitting. I was baffled because my mother had passed away 36 years ago. I drew the attention of my brother who also gasped at the sight and exclaimed, “Ma has come to escort our father.” We kept on gazing at her for a few seconds till our sisters climbed the stairs and came to the ICU. Our sisters did not see my mother. And then when we re-looked, we found that she had disappeared and instead some other old lady was sitting there. We had gasped at this incident relating to the visitation of a dead person to the world and we wondered ‘How could this happen’.

Today when I know about ‘Confirmation Bias’ I can, now, think that this incident also could be due to “Confirmation Bias” manifesting because of my strong belief in life after death. The ‘Confirmation Bias’ makes one visualize the things that one believes in. Confirmation bias is an aberration of the brain. Brain tends to fool us many a time as is the case of Confirmation Bias. My interest in brain aberrations led me to a similar phenomenon called ‘Pareidolia’.

Pareidolia is a phenomenon where the mind is wrongly perceiving things---normal as well as Paranormal. Let us understand what Pareidolia is.

Pareidolia is defined as a psychological phenomenon that causes people to see patterns in a random stimulus. This often leads to people assigning human characteristics to objects. Susana Martinez Conde¹ maintains that human brains are attuned to perceive faces – an entire region of the brain, called the Fusiform Gyrus, is dedicated to it. The face detection skill by this portion of the brain, coupled with, our brain’s compulsion to extract meanings from the sensory chaos that surrounds us, drives us to see faces where there aren’t any. Pareidolia is often taken as a logical explanation for apparitions seen in vague forms in low illuminating environments.

Pareidolia could be the reason, which, made me feel to see my deceased mother.

I think Pareidolia at work created an illusion in our minds (mine and my brother’s), so our minds could perceive our mother through a wrongly morphed face of our mother on the lady’s face because of external stimuli of thought. Sisters did not experience it as there were no stimuli to their brains as we had not shared our feelings with them. Thus, the mind under external stimuli, can lead to a perception of anomalous happenings which, actually, have not happened but are creations of the mind under external stimuli.

Maybe Pareidolia manifests due to lingering ‘Confirmation Bias’ prevailing in our subconscious mind. We shall examine in detail Pareidolia and its correlation with Confirmation bias when we are deep down exploring our topic, “Confirmation bias”

Now, coming back to the topic, we start with by exploring the meaning of the phrase, “Confirmation Bias”

Meaning of ‘Confirmation Bias’

The belief system in us has taken shape over past years of life and we do not wish to challenge it. The confirmation bias is the bias which pushes our inner self to accept from the available facts the ones which confirm what we believe in and discard the ones which contradict our belief system.

Deyva Segal² defines this term in the following way:

Confirmation bias is a psychological term for the human tendency to only seek out information that supports one position or idea. This causes you to have a bias towards your original position because if you only seek out information that supports one idea, you will only find information that supports that idea.

Spencer E A and Heneghan C³ posit a view that *Confirmation Bias occurs when an individual looks for and uses the information to support his own ideas or beliefs. It also means that information not supporting their ideas or beliefs is disregarded. Confirmation bias often happens when we want certain ideas to be true. This leads individuals to stop gathering further information when the retrieved evidence confirms their own viewpoints. In a*

way, the information that goes against our ideas and beliefs stands ignored. We pick out only those bits of information which support our belief system and the rest is ignored.

The definition given by Dictionary.com is as follows:

Confirmation bias is the bias that results from the tendency to process and analyze information in such a way that it supports one's preexisting ideas and convictions. (<https://www.dictionary.com/browse/confirmation-bias>)

Another definition:

Confirmation Bias is the tendency to gather evidence that confirms preexisting expectations, typically by emphasizing or pursuing supporting evidence while dismissing or failing to seek contradictory evidence. (<https://dictionary.apa.org/confirmation-bias>)

An article in The Economic Times⁴ has the following to say about this bias:

Confirmation bias is a psychological phenomenon in which a person tends to accept those references or findings which confirm his/her existing belief in things. Confirmation bias leads to statistical errors, as it influences the way people gather information and interpret it.

Confirmation bias is a type of cognitive bias that leads to poor decision-making. It often blinds us when we are looking at a situation. In other words, it prevents us from looking at a situation objectively to make a decision.

The meaning of "Confirmation Bias" is brought clearly in the above paragraphs. Our mind tries to filter out available information and gathers the ones which support our belief system and ignore the ones which oppose it. In the process, many a time, we assimilate what is really not true.

Let us now look at different types of "Confirmation Bias". The subject matter to which this bias is concerned defines its types. Let us explore this aspect:

Types of Confirmation Bias

Different types of this bias are outlined by Deyva Segal²:

Biased Search- *This type of bias occurs when you do research and only look for information that supports your theory or hypothesis. In our modern era, search engines help us with this biased tendency.*

For example, if you search for a question with two variables such as, "Is renting better than buying?", you will be served search results that support renting a home over buying one. If you search the opposite question, "Is buying better than renting?" you will get search results that support buying.

Biased Interpretation- *This type of bias explains why you may tend to interpret data and information in a way that supports your opinion or hypothesis, regardless of the position supported by the data.*

Biased Memories- *This refers to a biased recall of memories. Studies show that you may remember events that support an idea you have more than ones that disprove it. Some experts believe your brain may even store information that agrees with your views more frequently than information that disproves them.*

All types of bias create artificial thinking which is created around your belief system. It takes you far from reality.

This bias is there with us from time immemorial. It is interesting to note that this phrase, though, came into existence only in 1960 when English Psychologist Peter Wason coined it, but this bias has been with us for a long time. Let us look at its history

History of 'Confirmation Bias'

The idea of this bias echoed in a narration by Francis Bacon in 1620 when he described this bias in the following manner: "Once a man's understanding has settled on something (either because it is an accepted belief or because it pleases him), it draws everything also to support and agree with it. And if it encounters a larger number of more powerful countervailing examples, it either fails to notice them, or disregards them, or makes fine distinctions to dismiss and reject them, and all this with much dangerous prejudice, to preserve the authority of its first Conceptions" (<https://catalogofbias.org/biases/confirmation-bias/>)

Confirmation bias was known to the ancient Greeks. It was described by the classical historian **Thucydides** in his text '*The History of Peloponnesian*'. He wrote, "It is a habit of mankind to entrust to careless hope what they long for and to use sovereign reason to thrust aside what they do not want" (Schlosser, J A⁵)—it captures the heart of this bias.

Kayla Van⁶ brings to us an interesting account of the history of this trait: Although concepts of confirmation bias existed before the 19th century (Francis Bacon's *Novum Organum*), a few notable people also described this idea in some of their works. Arthur Schopenhauer, a German philosopher who wrote *The World as Will and Idea* in 1844, described what is known as confirmation bias today. Schopenhauer wrote, "A conceived hypothesis gives us lynx-eyes for all that confirms it, and makes us blind to all that contradicts it (Schopenhauer 420). Russian novelist Leo Tolstoy also described the concept of confirmation bias in a few of his works. In *The Kingdom of God Is Within You* (1893), he wrote, "It is possible to explain the most intricate matters to a man of very hard comprehension, so long as he has not formed any idea about them; but it is impossible to explain the simplest thing to a very clever man if he is firmly convinced that he knows, and, besides, incontestably knows, what has been transmitted to him (Tolstoy 30)."

Various philosophers and writers noticed this bias occurring within individuals' minds and recognized its negative effects on their decision-making tasks. These expressions were often used as wise philosophical phrases to describe some of the human behaviors in the past leading up to the 19th century. It was not until the 20th century that this cognitive phenomenon would be scientifically investigated and properly defined in the area of social psychology.

In the 20th century, the idea of confirmation bias came to form with Peter Wason's Selection Test. In 1960, Wason released a paper introducing a task called the "2-4-6 task." Wason explained the instructions in his paper as follows, "You will be given three numbers which conform to a simple rule I have in mind ... Your aim is to discover this rule by writing down sets of three numbers, together with reasons for your choice of them. After you have written down each set, I shall tell you whether your numbers conform to the rule or not. Remember that your aim is not simply to find numbers that conform to the rule, but to discover the rule itself. When you are highly confident that you have discovered it, and not before, you are to write it down and tell me what it is". Wason did this task with "twenty-nine participants" who were "undergraduate students". He eventually found that "a majority of participants immediately following the announcement of an incorrect rule tested a new triple that was compatible with the rule just rejected" (Evans 2078). The more confirmations of their hypothesis they had, the more the individuals were swayed they had the correct rule. Although he did not call this occurrence confirmation bias or verification bias, he would eventually coin the term "confirmation bias" later in his other works and become known for it.

As research techniques advance with technology in the 21st century, new fields and methods developed to help further explore and possibly explain the occurrences of cognitive phenomena.

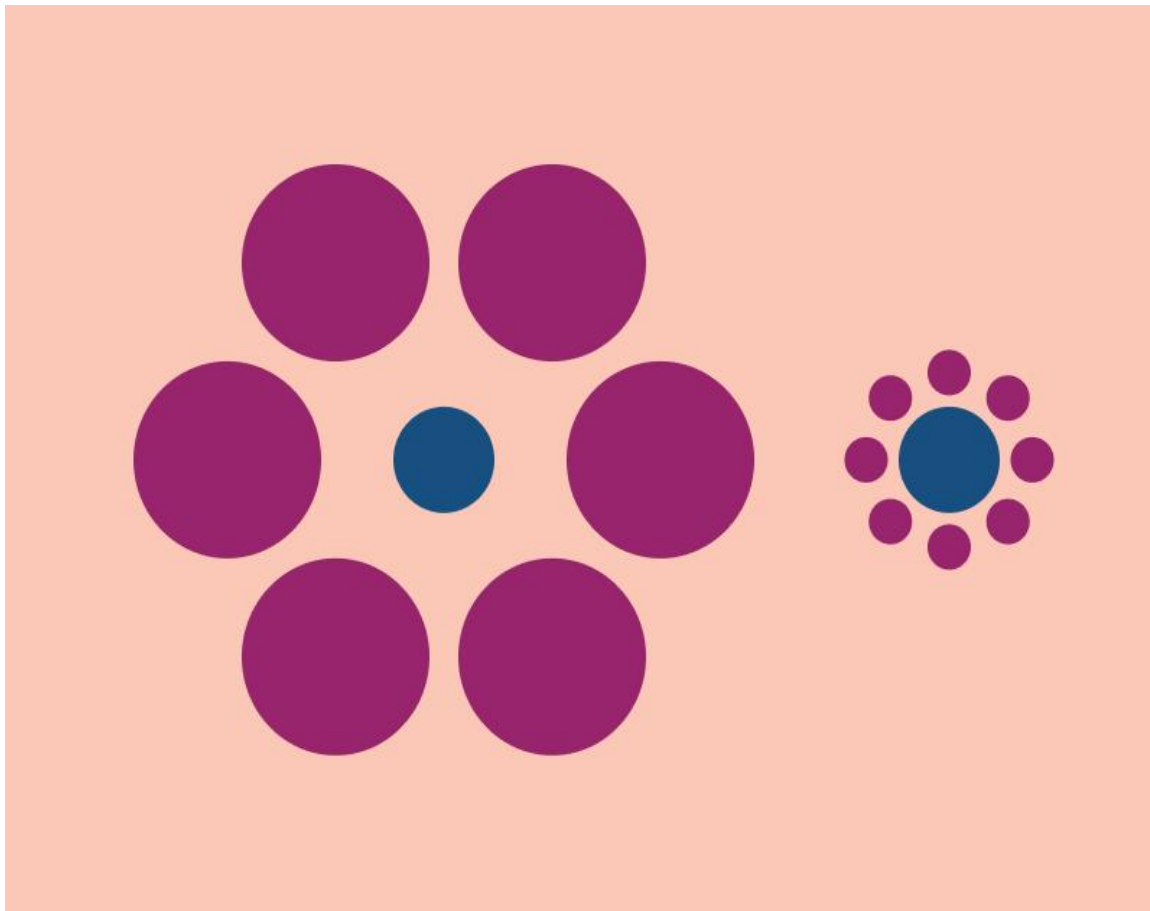
The humans had this trait embedded in their psyche from time immemorial, it is only recently that we have started discussing and analyzing this bias. While analyzing it humans explored why and how this bias crept into our psyche and here is what was found:

Causal Roots of Confirmation Bias

The main reason for the manifestation of this bias is the ease with which the brain accepts the evidence supporting the belief system. If evidence is against it, the brain has to work harder to accept it so the brain is tempted to choose the easier path and it makes confirmation bias happen. This is not the only way that the brain fools us.

Our brain is a mysterious organ and it fools us many a time. Manifestation of confirmation bias is one of them.

Look at the following picture:



(Source: <https://biasinsideus.si.edu/online-exhibition/the-science-of-bias>)

Look at the blue circle in two pictures. Which blue circle is bigger? Your mind will surely indicate that the one on the right side of the picture is a bigger blue circle.

This is how the mind is fooled! Both are the same size!!

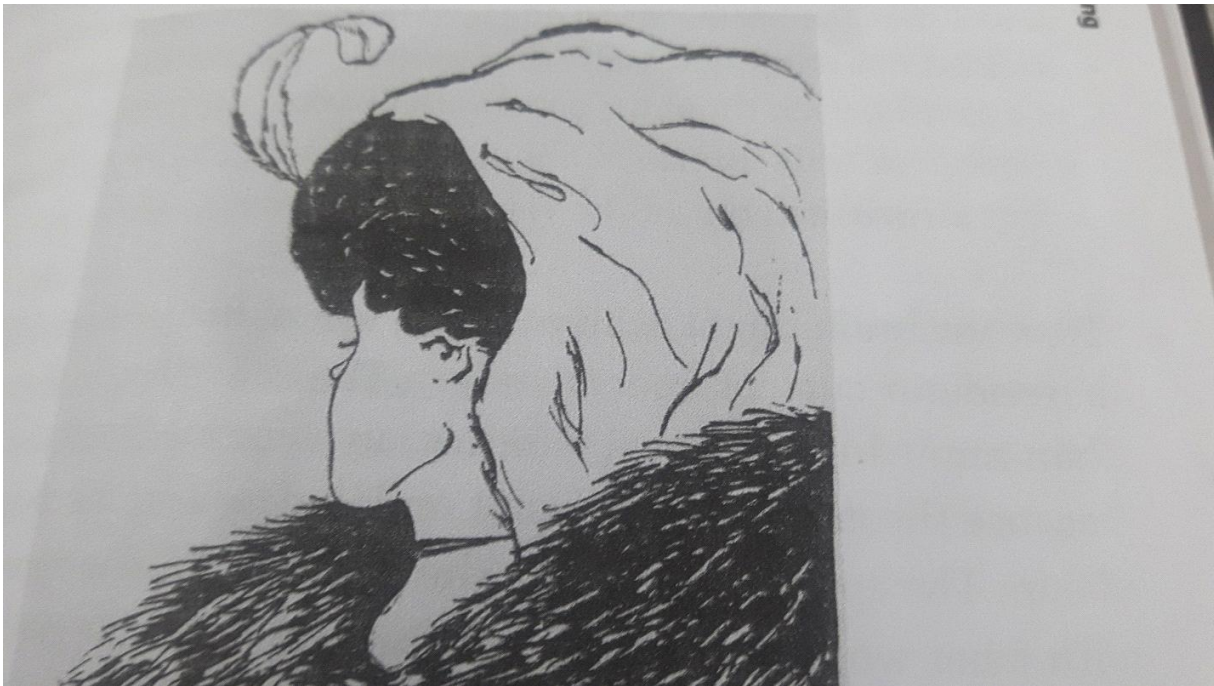
Our brain tends to fool us many a time, and confirmation bias is proof of this. It fools us in a way that we do not realize that what we are interpreting is not true.

If you look at clouds intently, your mind will capture a familiar face in the clouds. Maybe a bear or an elephant or a human face will emerge to us staring from the clouds. Similarly, if you look intently at the water spilt on the floor, a known pattern will emerge from the water. Our mind has a tendency to bring out familiar patterns from complex things which come before us and the brain happens to fool us many a time. This is Pareidolia which I talked about somewhere in the above paragraphs.

Pareidolia is defined as a psychological phenomenon that causes people to see patterns in a random stimulus. This often leads to people assigning human characteristics to objects.

Susana Martinez Conde¹ maintains that human brains are attuned to perceive faces – an entire region of the brain, called **Fusiform Gyrus**, is dedicated to it. The face detection skill by this portion of the brain, coupled with, our brain's compulsion to extract meanings from the sensory chaos that surrounds us, drives us to see faces where there aren't any. Pareidolia can also result in a perception of two things from a single image.

This visual illusion created by Pareidolia can be experienced by looking intently at the painting entitled "My Wife and Mother-in-law" by W E Hill. You will either see a young woman looking away or the profile of an old woman; two perceptions contained in the same picture. The picture is reproduced below:



(Source: <https://study.com/academy/lesson/illusion-facts-types-examples-psychology.html>)

The fooling done by the brain surely causes confirmation bias and hence the causal roots of this bias certainly lie in the working of the brain.

We observed in the above paragraphs that Pareidolia is the tendency of our brain to link faces to the complex patterns before it like the clouds bringing to us faces of bears, elephants... and spilt water on the floor assumes some faces to us.

Pareidolia and Confirmation bias appear to be two faces of the same coin. This is echoed in the quote given below:

When you need something to be true, you will look for patterns; you connect the dots like the stars of a constellation. Your brain abhors disorder. You see faces in clouds and demons in bonfires. Those who claim the powers of divination hijack these natural human tendencies. They know they can depend on you to use subjective validation in the moment and confirmation bias afterwards.—**David McRaney** (https://www.goodreads.com/author/quotes/4945190.David_McRaney)

This leads us to believe that "Confirmation Bias" must have some correlation with our brain because it seems to be manifesting due to the brain's capability of fooling us. It is not clear what causes this bias in our brains. Thinkers have given some thoughts on this.

Pilat D., & Sekoul D.⁷ throw some light on the causal roots of confirmation bias: Confirmation bias is a cognitive shortcut we use when gathering and interpreting information. Evaluating evidence takes time and energy, and so our brain looks for shortcuts to make the process more efficient.

Our brains use shortcuts

Heuristics are the mental shortcuts that we use for efficient, though sometimes inaccurate, decision-making. Though it is debated whether or not confirmation bias can be categorized as a heuristic, it is certainly a cognitive strategy. Specifically, it helps us to avoid cognitive dissonance by searching and attending to information that we already believe.

It makes sense that we do this. Oftentimes, humans need to make sense of information quickly however, forming new explanations or beliefs takes time and effort. We have adapted to take the path of least resistance, sometimes out of necessity.

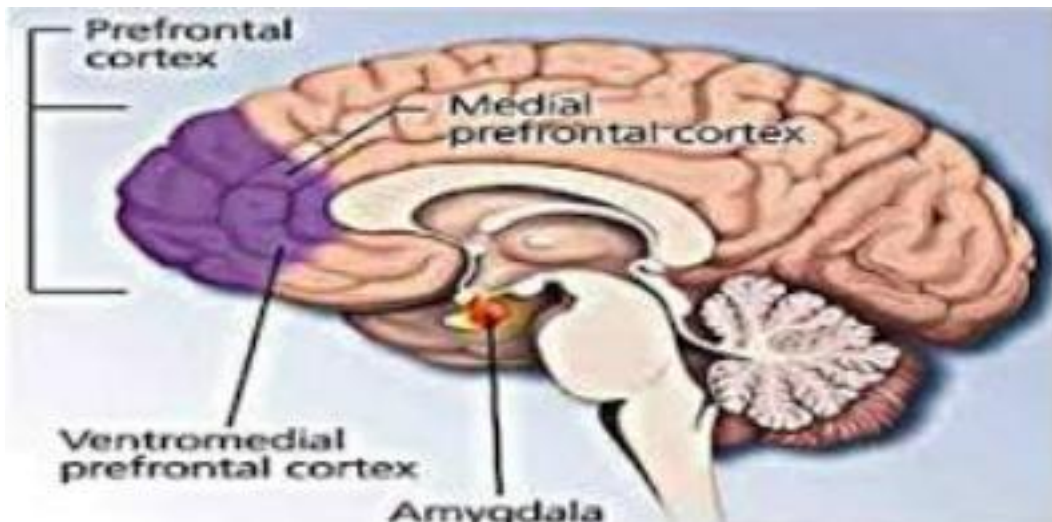
Evolutionary psychologists believe that the modern use of mental shortcuts for in-the-moment decision-making is based on past survival instincts and hence are necessary even if they mislead us and create Confirmation Bias.

No one likes to be proven wrong, and when information is presented that violates our beliefs, it is only natural to push back. Deeply held views often form our identities, so disproving them can be uncomfortable. We might even believe that being wrong suggests that we lack intelligence. As a result, we often look for information that supports rather than refutes our existing beliefs.

The brain does choose an easier path to manifest this bias and this processing happens in a particular area of the brain. Leslie Nemo⁸ has the details:

A new brain imaging study provides some insights into the specific regions that give rise to confirmation bias.

A [Nature Neuroscience study](#) looked at participants' brains as they made choices while considering a partner's decisions. The researchers found that a small region toward the front of the brain called the *posterior medial prefrontal cortex*, associated with judging performance and mistakes, was more active during the task.



Specifically, it was active when individuals were processing someone's agreement with their opinion, but not when they were dealing with an opposing view.

Seeing that this brain region responds more strongly when our suspicions are confirmed helps explain the mechanism behind cognitive bias, says study co-author Andreas Kappes, a neuroscientist with the City University of London.

Thus, nature has gifted us with an area in the brain which avoids cognitive dissonance and opts for an easy solution even if it means selecting a wrong option through confirmation bias.

Having explored, the meaning of "Confirmation Bias", its types, its history, its brain correlates, and its causal roots; we shall conclude the paper after exploring its significance.

Confirmation bias is an important part of our psyche and it is going to remain a part of our persona. Not that it carries a prominent place in all of us, some of us are more rational in thinking and may rarely get this bias but normally this trait is present in most of us. It may have a negative impact but its significance cannot be denied. Whatever it is, the bias holds an important status in our lives.

We shall now look at its importance in our lives:

Significance of Confirmation Bias for us

The meaning of 'Confirmation Bias' is suggestive of the fact that it is a negative trait and deserves careful attention. This bias badly affects our decision-making because it causes us to overlook pivotal information that goes against our beliefs. A poorly informed decision does not lead to optimal actions because all of the potential alternatives do not participate in actionable decisions. There are great chances that we are led to the wrong path.

Another influence it has on our psyche is that it tends to pollute the inner self. Our inner self was a clear mirror when we were born and as we grow it gets tainted with our learning from the experiences which gives it some tinge. But negative traits like confirmation bias build translucency over the mirror and make our inner self blind to some extent.

Wikipedia⁹ brings out the influence of this bias on Social Media- In [social media](#), confirmation bias is amplified by the use of [filter bubbles](#), or "algorithmic editing", which displays to individuals only information they are likely to agree with, while excluding opposing views. Some have argued that confirmation bias is the reason why society can never escape from filter bubbles because individuals are psychologically hardwired to seek information that agrees with their preexisting values and beliefs. Others have further argued that the mixture of the two is degrading [democracy](#)—claiming that this "algorithmic editing" removes diverse viewpoints and information—and that unless filter bubble algorithms are removed, voters will be unable to make fully informed political decisions. Not only this, Confirmation Bias happens to help in spreading fake news, the ones that are close to a belief system. The rise of social media has contributed greatly to the rapid spread of [fake news](#), that is, false and misleading information that is presented as credible news from a seemingly reliable source. Confirmation bias (selecting or reinterpreting evidence to support one's beliefs) is the main hurdle as to why critical thinking goes astray in these circumstances and fake news spreads.

While it is a negative tendency that impairs logic and decisions, it isn't always bad. It does have some positive side. The bias, in a way, also positively impacts our lives. It helps us stay confident in our beliefs and values and give us a sense of certainty and security. Dayva Segal² gives some benefits of Confirmation Bias-

Helps to process information- *Some people believe that confirmation bias helps you sort efficiently through the large amount of information you see every day.*

Builds confidence- *Other experts think that people seek out information to support their opinions to preserve or build their self-esteem. Finding information that supports their ideas makes them feel more confident.*

Reduces mental conflict- *Another theory about why people use confirmation bias is that it reduces the risk of mental conflict, also called cognitive dissonance. When someone holds or has information about two opposite ideas, they may experience psychological stress. Confirmation bias may lower the risk of feeling negative emotions from the stress.*

More thinkers bring out the positive side of Confirmation Bias. Uwe Peters believes that confirmation bias evolved because it helps us influence people and social structures so that they come to match our beliefs about them. This can result in significant developmental and epistemic benefits for us and other people, ensuring that over time we don't become epistemically disconnected from social reality but can navigate it more easily. (file:///C:/Users/admin/Downloads/s10670-020-00252-1.pdf)

Confirmation Bias influences our lives in so many ways; mostly it has a negative influence because it tends to drift us away from realities because the information opposing our belief systems is disregarded. But still, as we saw in the above paragraph it does have some positives attached to it.

With this, we reach the end of the paper.

We have explored startling facts about this bias and I am sure that readers have now become familiar with different aspects of this bias. The human brain is so wired that it takes shortcuts while processing information put before it and that is the reason that it assimilates only those pieces of information which are close to our belief system and disregards the ones opposing it.

The following describes this bias in a very interesting manner:

"If you are thinking about buying a particular make of new car, you suddenly see people driving that car all over the roads. If you just ended a longtime relationship, every song you hear seems to be written about love. If you are having a baby, you start to see babies everywhere. Confirmation bias is seeing the world through a filter."— **David McRaney**

(https://www.goodreads.com/author/quotes/4945190.David_McRaney)

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