

## **Confirmation Bias: Does It Vary By Culture Or Education Level?**

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**Abstract:** Confirmation bias occurs when individuals seek out only information that agrees with their beliefs and filter out conflicting information. This typically results in poor decision-making. This study sought to determine if confirmation bias is related to culture and to determine if higher levels of education will reduce confirmation bias. Cultural comparisons were drawn from the U.S., Taiwan, China and Europe. The study found no significant difference from one culture to another. Confirmation bias was a problem in each culture. Confirmation bias was also measured among a group of first semester freshmen, junior and senior BBA students and among mid-career MBA and EMBA students. Surprisingly, the higher levels of education did not reduce the degree of confirmation bias. The study suggests that much more attention should be given to improving critical thinking skills in order to reduce confirmation bias and to improve decision-making.

**Key Words:** Confirmation bias; culture; devil's advocate; critical thinking

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### **I. Introduction**

*"Most of our problems do not occur because of what we don't know...they occur because of what we do know that just ain't so!"* Mark Twain

In layman's terms, confirmation bias is the tendency to seek out only information that is consistent with our viewpoint and to screen out opposing information. In a more academic description, confirmation bias is the tendency to make perceptual errors that result in hindering effective decision-making. The perceptual errors that make-up confirmation bias include attribution error, optimism bias, primacy effect, anchoring, and self-servicing bias. Confirmation bias has the potential for reducing decision effectiveness in each of the four primary organizational decision-making models: The rational model, the Carnegie model, the incremental process model and the garbage can model. (Gatlin, 2017)

Confirmation bias has been found to have a negative impact in many fields. It was shown to play a role in military pilot error (Stewart 2006), in doctor's offices (Bradford, 2015), and in investment decisions (Bashir, 2013). At least two professions have found that confirmation bias play significant roles in their profession. In the legal profession, attorneys are taught to provide only information that support their client and to make every attempt to keep contradictory evidence from being heard by a jury. In the auditing profession, auditors are taught to question initial information and impressions to avoid confirmation bias. (Jones, 2001)

Confirmation bias also plays a negative role in society as a whole, regardless of the cultural setting. It is easy to see in politics in the U.S. where approximately one-third of voters will only listen to conservative information sources and ignore contradictory information while another third will listen only to liberal sources and screen out contradictory conservative sources. The result is that we have a fractured and poorly functioning political system where decisions that are made frequently do more harm than good. The same can be said for the political systems in Taiwan, China and many countries in Europe. It is also seen in the area of religion, where beliefs are frequently not to be questioned.

Confirmation bias results from failure to critically analyze information, problems, opportunities and potential strategies. Groupthink occurs when highly cohesive groups bring pressure on the members of the group to accept group decisions without question, to not critically evaluate decisions by the group. Confirmation bias is a form of Groupthink without the group.

This study sought to answer two questions. First, is confirmation bias related to culture? And second, is it reduced as educational level increases? To answer the first question, data was collected from 68 EMBA students in Asia, 228 students in the U.S. and 70 students in Europe. To answer the second question, data was collected from 65 first semester freshmen, 97 junior and senior level students, and 134 mid-Career MBA students in the U.S.

## **II. Methodology**

A British psychologist, Peter Wason, conducted much of the original research on confirmation bias in the 1960's. This study used an approach very similar to Wason's. Students were provided with three sequences of numbers. They were told that each set of numbers follow a certain 'rule or pattern' but were not told what the rule was. The three sets of numbers included: 1-2-4; 2-4-8; and 5-10-20. The students were asked to do three things. First, develop a set of three numbers that follow the same pattern or 'rule'. They were then asked to give a written explanation of the 'rule or pattern'. Finally, the students were asked to identify, on a scale ranging from 10% to 100% their level of confidence that they had correctly identified the 'rule or pattern' being followed. Results were identified for three different cultures (Asia: China and Taiwan; the U.S. and Europe). Results were also identified for three different levels of education. These samples included first semester freshmen with an average age of 18, Junior and Senior Business Students with an average of 21 and mid-career MBA and EMBA students with an average age of approximately 30. Given the relatively small sample sizes, Chi-square analysis was used to test the results.

## **III. Results**

The first test hypothesis was:

H1: There is no statistically significant difference in the tendency for confirmation bias between cultures.

Data results for Asian EMBA students in China and Taiwan included 68 samples. Of these, 60 identified an 'incorrect rule'...most commonly that each number had to be twice the size of the previous number. While the examples they had been shown did double each time...this was not the rule. The actual rule was simply that each number had to be larger than the previous number. The samples they had been shown created an immediate perception and the subjects were reluctant to question their initial impression. This failure to question one's thinking is one of the hallmarks of confirmation bias. Only 8 of the students in this sample correctly identified the numerical rule. The average confidence level for students who identified the rule incorrectly was 91%. The average confidence level for the few students identifying the correct rule was only 50%.

Data results for U.S. students included 228 samples. Of these, 207 identified an incorrect 'rule', most commonly that each number had to be twice the size of the previous number. Only 21 students correctly identified the much simpler and straight forward rule that each number was larger than the previous number. The average confidence level for the incorrect respondents was 85%. The average confidence level for the accurate respondents was only 51%.

Data results for European students included 70 samples. Of these, 69 identified an incorrect 'rule'. As with the Asian and U.S. students, the European sample generally felt that each number had to be doubled. Only one of the European students identified the correct rule.

Results were tested using Chi-square analysis. The results confirm the Hypothesis that culture does not have an impact on confirmation bias. The Chi-square statistic for U.S. vs. Asian students was 0.3867, p-value was .53406. This result is not significant at the .01 level of significance. The Chi-square statistic for U.S. vs. European students was 4.7435, p-value is 0.2941. The result is not significant at the .01 level of significance. The null hypothesis that there is no relationship between culture and the tendency toward confirmation bias is found to be true.

This study indicates that there is little variation in confirmation bias between Asian, U.S. and European business students. In each case, the students were found to suffer from confirmation bias to a great degree. The tendency to fail to critically analyze information and to seek out other possibilities plays a role in reducing the quality of decision-making. The second research question sought to determine if higher levels of education result in lowering the incidence of confirmation bias.

H2: As education level increases, confirmation bias is reduced.

The sample consisted of 65 first semester freshmen, 97 3<sup>rd</sup> and 4<sup>th</sup> year undergraduate students, and 134 mid-career MBA and EMBA students. Chi-square analysis indicates that there is little or no difference between the three groups of students. The Chi-square value comparing mid-career MBA and EMBA students with junior and senior Level BBA students was 4.7192, with a p-value of .029827. This result is not significant at the .01 level of significance. The Chi-square value comparing MBA and EMBA students with first semester freshman was 0.4175 with a p-value of .518202. This result is not significant at the .01 level of significance.

The test hypothesis was found to be false. Unfortunately, higher levels of education do not, in and of itself, reduce the tendency of individuals to experience confirmation bias. An interesting outcome of the study involves the confidence level displayed by those who identified an incorrect pattern as opposed to those few who identified the number pattern correctly. A third hypothesis was tested regarding confidence levels displayed by the two groups.

H3: There is no significant difference between the confidence level displayed by students incorrectly identifying a mathematical pattern and those correctly identifying the pattern.

The null hypothesis was found to be false. There is a significant difference between the two groups at the .01 level of significance. For the sample, those identifying an incorrect numerical pattern identified an average confidence level of 87%. For those few who identified a correct numerical pattern, the confidence level was only 53%. The Chi-square value of 64.9674 indicates that the two groups are significantly different at the .01 level of significance. This might suggest that the stronger one feels he/she is right, the more likely they may be wrong. This is likely an outcome to be expected from those suffering from confirmation bias.

#### **IV. Conclusions and Recommendations**

This study confirms that confirmation bias is a serious perception related problem that can have a negative impact on decision-making. Confirmation bias grows out of a combination of attribution errors: the primacy affect, anchoring, optimism bias and self-serving bias. The study suggests that confirmation bias is a human condition unrelated to culture or educational level. Subjects who are impacted by significant confirmation bias will be more likely to make poorer choices than those who are better at critically analyzing information. Given that education level was not found to result in less confirmation bias, it can be argued that we as parents and our schools in general have done a poor job of teaching critical thinking skills and habits. It has also been suggested that confirmation bias may be on the rise due to the impact of technology and social media.

Paul Resnick and colleagues at the University of Michigan's School of Information argue that "collectively, online filters will isolate people in information bubbles only partially of their own choosing, and the inaccurate beliefs they form as a result may be difficult to correct. Ironically, then, the proliferation of search engines, news aggregators and feed-rank algorithms is more likely to perpetuate ignorance than knowledge" (Chamorro-Premuzic, 2014)

In a recent Time magazine article on the problems being caused by the growth of social media, Roger McNamee suggests that for social media, and particularly Facebook there are dangers. "To Facebook, facts are not an absolute; they are a choice to be left initially to users and magnified by algorithms. In the same vein, Facebook's algorithms promote extreme messages over neutral ones, which can elevate disinformation over information, conspiracy theories over facts. Like-minded people can share their views, but they can also block out any fact or perspective with which they disagree" (McNamee, 2019). While not a focus of this study, the relationship between the growth of social media and the impact on confirmation bias might prove to be fertile research ground.

What can be done to improve critical thinking skills in order to prevent or reduce confirmation bias? One of the most common approaches is to appoint individuals or small groups to play the role of Devil's Advocate when approaching a decision. These individuals are not simply given a chance to be a contrarian, they are charged with the responsibility to critically advocate for 'another look'. The concept of using the Devil's Advocate approach is not new but it is infrequently taught in a formal way in most business schools. The practice was started by the Roman Catholic Church hundreds of years ago. When someone was being

considered for sainthood, certain priests were appointed to ‘represent the devil’ and to point out reasons why the person should not receive sainthood. Fortunately, most business leaders are not candidates for sainthood and do not rise to that level of scrutiny. In spite of the age of the Devil’s Advocate technique, there is little attention paid to actually teaching the skill. There are numerous other techniques that can also be taught that will improve critical thinking skills. These include Brainstorming, Nominal Group Technique, Delphi Technique, Ishikawa Diagrams (Fishbone Diagramming) and the 5 Whys method developed by Sakichi Toyoda in the 1930’s. These techniques became more popular and widely used in the quality movement that grew rapidly in the 1970’s.

Another more recent suggestion for improving individual and especially group decision-making can be found in Edward de Bono’s widely acclaimed book ‘The Six Thinking Hats’ (1985, de Bono). The book suggests that individuals and especially groups should go through six structured approaches to solving a problem or developing a strategy. In each step, the individual or group must assume the role of ‘wearing a certain hat’ that represents the required way to think of the issue. When wearing the white hat, one must list known facts, truths, and figures. No speculation is allowed. When wearing the red hat, emotions, feelings, intuition and hunches are allowed. The time devoted to red hat thinking is typically restricted. Black hat thinking calls for caution. You list the reasons an idea may not work. The focus may be on content and process. Yellow hat thinking looks for constructive, positive thinking. Why might a solution work. Green hat thinking is creative, non-judgmental, lateral thinking. Blue hat thinking requires focus, control of thinking and the use of summaries and conclusions. When using blue hat thinking one is acting like a conductor of an orchestra. He/she controls the tempo but do not actually play an instrument or ‘make the music’.

A final recommendation is for leaders to encourage a culture of critical review. An example is Warren Buffett. At a recent annual meeting of Berkshire Hathaway in Omaha, Warren Buffett invited Doug Kass to speak to the stockholders. Kass is a hedge fund trader who is a vocal critic of Buffett and his investment style. Rather than asking for validation of his approach and the exclusion of opposing views, Buffett sought out a contrary viewpoint (Dooley, 2013). This practice of encouraging dissenting views and of appointing well-meaning individuals to become ‘Devil’s Advocates’ may help reduce confirmation bias as will the use of the other critical thinking tools and approaches mentioned above.

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