

# RATIONAL REASONING FOR REALITY

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### 1. DEFINITION OF TERMS

- Reality- The real world that has the potential to cause effects that are observable.

### 2. INTRODUCTION

Rational thinking for developing claims about reality involves the use of the valid reasoning such as logic and science for determining the truth about reality. Some basic concepts used in rational thinking are described in this article in a practical way. Obstacles to rational thinking are described and examples given. Some recommendations are given on how to respectfully deal with people believing or making false claims. Also, some benefits to following the rational approach are mentioned.

### 3. RATIONAL SCIENTIFIC APPROACH

A key logical concept in Science for determining the truth about reality is called Proof by Elimination (PE). If there is a theory that describes a certain reality and all possible hypothesis for explaining that certain reality are false except for one hypothesis, then PE implies that this one non-false hypothesis is true. For example, if there are 10 different possible hypothesis for explaining a certain event and it is shown that 9 out of the 10 are implausible, implying they are false, then there would be a logical case that the one remaining plausible hypothesis is true.

The two assumptions PE is based upon is that there is a correct theory for explaining the reality being investigated and that reality follows the law of no contradiction. Without these two assumptions, reason could not determine the truth about any reality, supernatural or natural. If there is a correct theory that describes a certain reality and all possible hypothesis for explaining that certain reality are false except for one hypothesis, then PE implies that this one non-false hypothesis is true. If the remaining hypothesis were also false then there would be no correct theory which would contradict the premise that there is a correct theory. Thus, if the premise that there is a correct theory is true, then the one non-false hypothesis must be true otherwise the premise would be contradicted. Thus, PE is derived from the requirement for no contradiction which is a fundamental logical principal. Since PE is derived from a logical concept PE is also a logical concept. Science attempts to use PE and other logical concepts to

determine the truth about reality; thus, the scientific procedure has the potential to logically determine something true about reality.

Making a scientific case for some claim involves showing all possible hypothesis are false except for one. Thus, the scientific procedure involves determining what are all the possible hypothesis and collecting relevant data from observations to check if the data implies any of the possible hypothesis false. Observation of reality plays a key role in the scientific process because observation is the one source of information humans themselves have about reality. Thus, a scientist job involves collecting as much relevant observations through experiments or research to see if any of the information implies any of the possible hypothesis false. If it can be definitely shown that all possible hypothesis are false except for one, then a case has been made that the one hypothesis that is not false is true. Hypothesis are shown false by either deterministic criterion or indeterministic criterion.

### **3.1 Deterministic Principals**

Deterministic principles are non-probabilistic mathematical or logical principles. If a hypothesis contradicts a deterministic principle, then it is considered false.

### **3.2 Indeterministic Principals**

Indeterministic principles are related to probabilities. If a hypothesis has a sufficiently low probability of occurring, then it is considered implausible, implying it is false. The way to check if an indeterministic criterion is appropriate and objective can be difficult because it is often difficult to estimate probabilities. There are mathematical formulas for probabilities. Mathematicians have come up with statistics which allows one to objectively estimate probabilities from randomly collected data, but this often requires a lot of data that is often difficult or essentially impossible to get. If one can show that a indeterministic principle is derived appropriately from probability or statistics then they have shown that the indeterministic principle is objective.

### **3.3 Summary**

If a hypothesis is shown true through just deterministic principles, then it is considered completely proven true. When indeterministic principles are involved then there are different levels of the strength of the argument depending upon how small the probabilities are for the other hypothesis that are considered false or implausible. The smaller the probability for all the other implausible hypothesis being true, the stronger the argument that the one plausible hypothesis is true. Some scientist have presented a certain small probability as small enough to consider the rational argument involving indeterministic principles a proof that the alternative hypothesis are false implying that just the one with a reasonable probability is the correct hypothesis. Ref. 3 determined a probability of  $10^{-150}$  which is small enough to apply to any claim about any known reality. Ref. 3 determined this number for subatomic events.

In many cases it is difficult if not impossible through PE to determine the truth about some issues. That is because in many cases it is not possible to rule out all hypothesis except one. This is especially true when continuous variables are involved. A continuous variable is a parameter that can take on an essentially unlimited number of values. For example, there are many different weights an apple could have so it is not possible to determine the weight of any apple perfectly. When scientist are working with continuous variables their claims are usually for an interval that they associate a probability to. For example, they will claim they are 99% sure that the weight of an apple is within 0.029 pounds of 1.231 pounds. In other words,  $1.231 \pm 0.029$ . While the scientist may not know the exact weight of the apple at least they are in a position to reject clearly false theories such as the apple weighs 10 pounds. A discrete variable is one that takes on just integers such as 1, 3, 0, -4 or -7. If one were considering just the number of apples, then only a discrete variable would be involved because the number of apples would always be some finite integer. Thus, with discrete variables the work with rejecting all other hypothesis can be finite; thus, practically solvable. Therefore, it may be possible to determine a certain hypothesis true such as the exact number of apples in a basket. For example, one can check a theory that there are four large apples in an ordinary basket by observing four large apples in the basket and then by looking meticulously through the whole basket and not observing any other large apples one can reject that there is anything else but four apples in the basket, making the logical case through PE that there are truly four apples in the basket.

Inherent to the scientific process is rejecting hypothesis; thus, a crucial part of the scientific process is developing appropriate theories and checking them with relevant observations to see if they are false. A theory that does not have the potential to be shown wrong is unfalsifiable. Thus, just the theories that are falsifiable can be checked through the scientific procedure of comparing observation to theory. If an approach to formulating hypotheses is one that can explain essentially all possible observations, then that approach does not have the potential to be rejected, in other words, it is not falsifiable. Thus, if an approach for establishing claims about reality is unfalsifiable it would not be considered a scientific approach.

A common mistake made is claiming to have proven a hypothesis true when all other possible hypothesis have not yet been shown false. Such mistakes are called premature conclusions or unsubstantiated claims.

### 3.4 Criterion

Scientists through using mathematics, logic, probability and statistics have developed a whole bunch of criteria for showing a hypothesis implausible. All certainly cannot be presented in this article; however, a few general and more specific ones are listed in this section because they are basic and commonly useful. These criteria are based upon both deterministic and indeterministic principles. The eighth criterion uses PE in conjunction with the first seven criteria to make the case a certain hypothesis is the correct one.

1. The hypothesis must explain something about the relevant reality (that is, taken together with other true statements, imply further statements describing present, observable data).
2. The hypothesis must not be illogical (that is, none of the assertions it makes contradicts any logical or deterministic principle)
3. The hypothesis must be self-consistent (that is, none of the assertions it makes contradicts any other assertion it makes)
4. The hypothesis should be more plausible (that is, make the observable data more probable, Bayes equation) than the total probability of all the rival hypotheses
5. The hypothesis should explain more about the relevant reality (that is, imply a greater variety of observable data) than all the rival hypotheses.
6. The hypothesis should be more consistent with reality (that is, be implied by a greater variety of accepted truths about reality, and its negation implied by fewer accepted truths about reality) than all the rival hypotheses
7. The hypothesis should be less ad-hoc (that is, include fewer new suppositions about reality not already implied by existing knowledge) than all the rival hypotheses
8. The hypothesis must fulfill 1-3 and so exceed its rival hypotheses in fulfilling conditions 4-7 that there is little chance (as calculated by Bayes equation for all rival hypotheses), after any further investigation that any rival hypothesis would exceed it in meeting these conditions.

From these general criteria more specific or practical relevant criteria can be derived such as those listed below.

Humans are quite complex; thus, their behavior is difficult to describe by deterministic principles. However, there are definite trends about the way humans are motivated and think; thus, certain criteria can be made that make claims about the probability of different actions. From this understanding the following more specific relevant criteria have been developed. These guidelines are practical ones useful for cases involving evaluating human testimony such as typically done by jurors.

1. Neutral or hostile testimonies- typically have a much higher probability of being reliable than self-advantage testimony because there is typically no reason for a neutral or hostile person to fabricate a report with which they have no motivation for producing.
2. Multiple attestation- The more independent sources in which an event is recorded, the stronger the support for it actually representing a true historical event. Independent sources are not as likely to be under the same influences; thus, are less likely to have the same motivation; therefore, it is less likely that they would make up the same thing; thus, their reporting the same thing increases the probability that the reported event is authentic.
3. Self-embarrassing reports- There is no self-serving motivation for self-embarrassing reports; thus, it is less probable that self-embarrassing reports are fabricated which means it is more probable that they are authentic.
4. Coherence- The more consistent a report is with other reports that are considered reliable or the archaeological record, the greater the probability it is authentic.
5. Eyewitness testimony- In order for a report to be reliable, the testimony must ultimately have as its original source the testimony of witnesses who actually observed the events reported.

Some claim the scientists have been wrong in the past; therefore, scientific claims can never be trusted. Such examples do not necessarily imply any problem for the actual scientific method because these past incorrect scientists may not have been properly applying the scientific method. They may not have been using PE to determine their hypothesis true. For example, they may have assumed that planet orbits followed a circle well they had not yet proved they followed another orbit such as an ellipse. Certainly the consensus scientific positions or the best known theories have turned out to not be completely correct. However, this does not justify claiming no scientific claim can be compelling. Whether or not past consensus scientific positions were completely correct is not a crucial point for determining if scientific claims can be compelling. The crucial point is whether or not certain scientific criteria have

ever been incorrect. For example, has anything ever definitely determined true by proof by elimination turned out to be false. Has any of the criterion used to determine hypothesis false ever turned out to be identify a true hypothesis false. For example, has something occurred that has a very low probability when the probability calculation was definitely done conservatively. Has something ever occurred in nature that definitely contradicts something else that occurred in nature.

### **3.5 Rational Critical Thinking and Faith**

Checking if a hypothesis is wrong is a crucial part of the rational thinking process which means one thinks critically. Some may have the impression that all critical thinking people are just looking to try to show somebody is wrong or right; thus, just have a negative self-serving attitude. There certainly are such cases where certain people just like to point out that others are wrong. A condition where a person is being critical just for the stake of showing other people wrong or right, this article defines as destructive criticism. Human society has a significant level of inconsistencies, more defensiveness than openness, unsubstantiated claims, priority given to emotions over rational reasoning for determining belief, manipulation, spin doctoring and hidden motivation. The more one understands rational reasoning the more they realize the extent these things occur in human society. Discovering this causes many people to get frustrated and often results in them digressing to destructive criticism. However, critical thinking does not have to digress to destructive criticism. Critical thinking is a crucial part of rational reasoning; thus, critical thinking can come from a genuine motivation to determine the truth. In general, it is beneficial to know the truth so critical thinking can be a positive thing and for a rational person is really a requirement to be intellectually honest. The more people know the truth the better they understand reality and can deal with it. Also, knowing the truth tends to makes one less vulnerable to being manipulated because false claims are more likely to be exposed.

As explained in Ref. 1, based upon good values, rational thinking can be used to make decisions that promote good values in society. Constructive criticism is interested in determining the truth about reality for the purpose of promoting of good values, rather than just for the purpose of showing some individual wrong or right. Constructive critical people can be compassionate and caring.

This article defines a belief where the evidence is strong enough to rationally prove the belief is true as “rational belief”. A belief in something about reality where there presently is no rational proof of it’s truth, is a belief that involves “faith”. In many cases where indeterministic criterion are used, the probabilities for showing the other hypothesis are small, but not small enough to consider the reasoning a proof. In these cases, the smaller the probabilities for the other hypothesis being false, in other words the stronger the case that the belief is true, the more the belief is characterized as “rational faith”. This article defines a case where there is no rational evidence that the belief is true as “blind faith”. This article defines a belief where the evidence has rationally proven it false as “irrational faith”.

The more something gives a person hope for the future, the more personal reason a person has for believing in that something.

## **4. IDENTIFYING IF A CLAIM IS RATIONALLY BASED**

Determining if a claim about reality is rationally based involves determining if PE has been used to prove the claim true. The previous section describes PE so one could possibly use the reasoning presented and other rational information to determine for themselves if PE has been used to show the claim true. This would involve collecting a sufficient amount of data and analyzing it using the rational criterion. In some cases not much effort is needed and in other cases much effort is needed to determine if PE has shown the claim to be true. In many cases even with all the available data it is not possible by PE to determine if the claim is true or false.

Scientific journals are supposed to fully explain the reasoning for their claims by statements within the article or by reference. Thus, claims made in scientific journals are supposed to be rationally based and presented in a way that the reader can check if the claims are indeed rationally based. Articles in Scientific journals do not always pass this test; however, of all publications, scientific journals have the highest standards for requiring a verifiable rational substantiation for claims about reality.

Most people are not in a position to research the proper publications or information in their investigation into some claim. This article presents some practical guidelines and examples that can help evaluating claims that people deal with in their common lives.

### **4.1 Critiquing the Expert**

People are often confronted with experts in different areas of their everyday lives where they have an interest in checking out the claims. For example, an automechanic may claim that the car needs an expensive repair job. A salesman may claim the deal they offer is much better than anything else offered. A contractor may claim that the house needs an expensive repair job. A doctor may claim that the bump under the skin is not cancer, rather just

temporary reaction to some trivial infection. In such cases it is of interest for the person to check out for themselves the validity of such claims. If the person is not an expert in that field, then it can be of value to educate themselves so that they can be able to critically evaluate the claim.

The first thing one can do is to ask the expert making the claim their reasoning behind them thinking their claim is true. Then perhaps the person can evaluate if the reasoning is valid. If they cannot, then a good option is to talk to other experts. Other experts agreeing independently especially on the reasoning is a good sign that at least the reasoning is commonly accepted by the experts in that field which at least implies that the individual making the claim was not just concocting up the reasoning. The best an expert can do is to give the person the tools to be able to evaluate the claim critically. For example, the expert could explain the reasoning for the claim and give the person the source of the information used in the reasoning such as a reference to a scientific journal. A good indication of credibility is if the expert gives the person the sources which provide the best criticism of their claims. If the expert making the claim does indeed have valid reasoning, then they should typically have no problem with presenting the reasoning and the best criticism of it. Thus, if the expert making the claim avoids presenting their reasoning or gets defensive when asked for it, then the expert is either not aware of reasoning for the claim or for some reason is unwilling to present it. If there is no good reason for the "expert" to not present his/her reasoning, then avoiding presenting the reasoning is an indication of lack of credibility.

Before asserting a claim to be true, scientist should have in some way made sure that all other possible hypothesis are false. Thus, a valid claim in a scientific article should in some way explain how they ensured that they considered all other possible hypothesis and showed them false. Articles that are a result of motivation by personal preference are often a result of a search to just select supporting data and will claim something true without going through the proper process of considering all the other possible hypotheses and showing them false. Thus, articles that claim to be scientific, but do not address in any objective way, how all the other possible hypotheses were shown false should be considered as a candidates for being just a biased article, not a scientific article.

When relying on somebody else's conclusions, that person's credibility is an issue when considering their testimony as evidence for the determining something as true or false. The information in Section 5 can help to evaluate someone's credibility. Credibility is not an absolute criterion. Just because one has always been credible in the past does not mean that will always be credible in the future. On the other hand, someone having no credibility in the past does not mean that will never be credible in the future. Thus, credibility criterion for humans are not absolute; thus, are not part of the rational criterion. For example, just because some scientist at one time thought a false hypothesis was true does not mean that no scientist's claims should ever be considered as reliable. People interested in valid reasoning should as much as possible focus on the data and the reasoning of the argument rather than the credibility of the people involved.

## **5. CHARACTERISTICS OF OBSTACLES TO THE RATIONAL APPROACH**

An obstacle to the rational approach is something that restricts people from rationally evaluating claims or causes difficulties for people to make their choices consistent with what is determined true or false by a rational evaluation. Obstacles can be either a presentation of misleading information or obstruction to obtaining the information useful for rationally evaluating a claim. Society has developed a lot of approaches that are not rational for defending positions about reality. Sometimes it is done intentionally for good or bad purposes and other times it is done unintentionally. This section discusses categories that identify characteristics of these approaches that can be obstacles to the rational approach. These characteristics are not always necessarily obstacles to the rational approach. The sections discuss cases or condition when the characteristics tend to produce obstacles to the rational approach.

For cases where manipulation is involved with a discussion, written discussion is preferred over verbal discussion. In verbal discussions the manipulator is much more able to make false claims without getting exposed because it is more difficult to critic their claims. For example, their reasoning can be glossed over and the supposedly "supporting data and reasoning" most often cannot be checked. In a written debate all the claims are recorded and time can be taken if needed to check out the claims by thinking through the reasoning and doing research and analysis.

Often in a discussion when asked for the reasoning for the claim, the person making the claim will just remain silent or change the discussion. In such cases the person making the claim does not think they can defend the claim or for some other reason they do not want to present their reasoning for the claim.

### **5.1 Emotions**

Emotions can have neutral, good or bad results. Just because one tries to be rational does not mean they do not have or appreciate emotions. Emotions are a real and genuine part of all rational and irrational people. The authors best suggestions on how to based upon one's good values, develop or maximize the amount of good emotions are

listed in Ref. 1. This section discusses how emotions can distract from the process of rationally examining claims about reality.

Humans are full of emotions, especially during the younger years. People have a strong desire to maintain certain good feelings they are comfortable with and people like to avoid uncomfortable feelings. What one believes about reality affects their emotions. Thus, often people will believe certain ideas because it makes them feel better even though the evidence may actually indicate that certain idea to be false. For example, acknowledging that one has a terminal disease or is an alcoholic, their spouse is unfaithful or their car needs an expensive repair job brings on negative emotions or pain. Acknowledging these realities typically brings on negative emotions which people who like to maintain good feelings may want to avoid. Thus, they may want to deny these realities which could cause them to believe or make false claims so they can maintain their preferred emotions. However, avoiding negative emotions in the short term can make long term consequence even worse because such approaches often avoid dealing with problems that should be dealt with.

A real example of well-known person avoiding the truth to minimized negative emotions in the short term, resulting in long term negative consequences is the famous singer with a very beautiful voice, Karen Carpenter. She had a serious problem with anorexia which is a curable psychological problem. In 1983, just 10 days before she died from anorexia her music partner and brother Robert talked with her and told her he could tell she had this problem and should try to deal with it. Unfortunately, Karen's response was the typically defensive one of denial. She said she did not have the problem and that he should not even discuss it with her because it was disrespectful and rude of him. She knew she had the problem, but her giving a priority to avoiding short term negative emotions, unfortunately kept her from admitting the truth and dealing with the problem, resulting in her death. At that time if she would have admitted her problem, she could have gotten treatment which would have saved her life because anorexia is curable.

Especially in first world countries, humans have plenty of extra resources beyond what is needed for just survival. Thus, people often spend a significant proportion of their time in doing things for their enjoyment and pleasure. American society is full of entertainment such as amusement parks, movies, television and comedians that are affordable to most all people. Much of the entertainment media through television and the movies focuses on entertainment by immediate stimulation of emotions rather than interesting or challenging the intellect. This is evident by the proportion humor, sensual scenes, suspense, sensual stories and violence in the stories of shows presented by the entertainment media. American society is full of material things to make one feel good such as fancy cars, fancy clothes, cosmetics, decorations, fancy food, fancy resorts, fancy homes, fun places to shop etc... Thus, the American society is full of ways for people to make themselves feel good and keep immediate emotions stimulated. One could keep themselves indulged in these stimulating emotions throughout much of the day. One could carry a walkman with them always playing stimulating music, always have their car stereo playing stimulating music, some work places keep music playing and then when they get home they could always keep the TV on some stimulating show.

One of the strongest emotions that causes people to be irrational is fear. In the moment of strong feelings of fear people can be completely captivated by the possibility of something about to occur. This can cause them to be distracted from thinking things through and using appropriate reasoning. In such a state of mind, a person is more prone to be irrational.

Feelings of guilt are difficult to deal with and make people uncomfortable. Thus, to avoid the feelings of guilt people can be motivated to deny evidence that they did something wrong.

When someone is challenged about a position they prefer to maintain, especially in a conversation, defensive feelings often develop. These defensive feelings can arouse emotions which can distract the conversation from focusing on the legitimate issues that should be addresses when rationally evaluating the person's position. Rational evaluation of any claims involves checking if the claim might be wrong. A person defensive to the extent that they are unwilling to consider that their position is wrong is a sign that the person just wants to maintain their position and is not willing to accept the implications of an unbiased rational evaluation of their claim.

Emotions are a real and genuine part of being human; thus, emotions should be given appropriate respect and appreciation. Emotions produce some of the most wonderful human experiences. Emotions do often influence people in what they believe; however, emotions do not provide an objective means for determining truth. Rational reasoning as explained in Section 3 does provide an objective means for determining the truth. Thus, rational reasoning rather than emotions should be the preferred means to discuss with people the truth about things.

This article focus on rational reasoning, but the author does not intend to dismiss the significance of emotions. Emotions are a real part of humans and should be considered by a rational person. By developing one's morals rationally, the author thinks one puts themselves in the best position to allow emotions to develop and occur in a way that makes for the best potential for a fulfilling human experience.

## 5.2 Motivation

American society with its capitalistic economy and intensive amount of media is full of people trying to sell things in business and even personal relationships for their own self-interest and not the interest of the one being presented to or the general community.

People have their own interest which motivates them and could make them bias in developing their claims for their advantage. For example, an expert could be uncritical of their own views or bias and promote theories as true when their theory has not yet been objectively shown true through use of PE as explained in Section 3. People often have their hidden agendas. To gain the advantage they prefer, it is often beneficial for them to convince others that something is true that has not yet been proven true or may even be false. For example, if a salesman selling a product could convince a potential customer that their claim which promotes their product is true, then the customer will be more likely to purchase their product.

Biased misleading presentations are often developed by strategically presenting just the information that supports their claim and making a perspective tailored to make the argument sound more convincing than it really is. This is called spin-doctoring when a presentation for supporting a claim intentionally excludes information that does not support the claim and a perspective is given that makes the presented information appear to support the conclusion more than it really does based upon the appropriate rational criterion.

Ref. 1 describes a method for trying to determine someone's motivation. This could help in determining the persons true motivation which can help in determining if the person making the claim would be interested in putting a spin on their presentation. Presentations where just specific selected out data are presented that support the claim are potential candidates for a spinned presentation. However, in many cases a genuine presentation just presents the best supporting data due to constraints such as lack of time. A presentation that provides the best tools to criticize the claims is a good sign of no spinning. Also, when data is presented, effort is made to present or consider all relevant data such as complete databases (for example, a survey of the complete relevant population) is also a good sign of no spinning.

Typically the more highly motivated make it into leadership positions. This strong motivation especially if for self gain causes the leaders to be more bias and less objective about especially claims that promote their agenda. Thus, quite often leaders produce unsubstantiated claims. This phenomenon has had a big affect on human society by leaders directing much of world history through use of unsubstantiated claims to influence those controlled or affected by the leaders in charge of businesses, political positions and other organizations that have an effect on society. Typically, the more unbiased and objective types do not have agendas that motivate them like the leaders, so they are less likely to get into leadership positions. However, it certainly should be pointed out that there are people with a significant amount of good or unselfish motivation that has played a significant factor in them becoming a leader. I wish this would be the case for more leaders because it would make the world a much better and fairer place for all.

## 5.3 Controlled Criticism Communities

Often people within certain communities or societies want the group to maintain a certain consensus or they may want to maintain control of the community or society. To keep the community believing their preferred positions it may be necessary to keep the people believing certain claims that are not true. Thus, criticism is controlled or not allowed so false claims are not exposed. The control of criticism could be done by pressuring the vocal critics or controlling information so it is difficult for people to become aware of the false claims. If the people in the group in general prefer to believe the false claims, then the people in general may pressure their peers to not criticize their false claims.

Highly motivated people tend to be the type that strive for positions of power or influence. It could be a position of political control in a government, financial control in a business or information control in the media or some other position that involves power or influence. If the motivation is for personal gain, then these people when in leadership positions are prone to tailor presentations to convince their subjects to believe certain things that help to maintain or grow the leader's power. If the motivation is for promoting a certain view or ideology, then if there is some rational evidence that portions of the ideology are false, then the leader is prone to tailor presentations or control information to make it artificially appear that the ideology is completely true. In cases where there is a personal interest in power or portions of the ideology is false, the leaders are prone to promote to especially the highest positions of their organization, people that will not object to their false claims; thus, creating a power or influence structure where criticism is controlled for the advantage of the leadership.

## 5.4 Presuppositionalism and Invincible Artificial Defenses

Trying to use PE to prove something true about reality is an approach that really tries to make a case for something about reality with the least amount of assumptions about reality. The two assumption that PE makes is that there is a correct theory about the reality being considered and reality is self-consistent. Without this

assumption, it would be impossible to develop a logical argument for anything about reality. Thus, PE involves the most minimal assumptions about reality, in other words, it make the most minimal amount of presuppositions.

Arguments for reality that do not make the most minimal amount of assumptions about reality, presume as true things that may not be necessary for determining the truth about some reality. Presuppositionalism is a category that describes these approaches where extra unnecessary assumptions are made for determining true something about reality. For example, a Presuppositionalist would assume planetary orbits were circular before making sure that the orbits did not follow another pattern such as an ellipse. A Presuppositionalist is one who gives presuppositions priority over the implications of observations. For an extreme example, if one presumed there were six apples in a basket and after seeing there were only four in the basket, still believed there were six in the basket, then he would be thinking as a Presuppositionalist. An unbiased scientist is one who tries to minimize presuppositions and tries as best possible to use logic such as PE and observations to determine the truth about reality. Note the "unbiased" adjective because there are those who claim to be scientists but are biased.

Presuppositionalism is quite common in many different parts of human society. Presuppositionalist often use invincible approaches to maintain their beliefs. A good sign of a Presuppositionalist is an unwillingness to admit to or follow legitimate rational criterion for determining (especially their personally preferred) hypotheses false. Not adhering to the implications of legitimate criterion for determining hypotheses false is an approach that allows one's beliefs to be disconnected from observations of reality that would imply their belief false. This could allow one to maintain their belief regardless of what is real; thus, such an approach would be invincible. This makes such approaches tempting because one can maintain the position they personally prefer. However, such approaches do not involve legitimate reasoning, in fact such approaches avoid legitimate reasoning because they are unfalsifiable, so such approaches are called Artificial Invincible Defenses. Scientific approaches are supposed to be falsifiable and open to consideration of any data that might show a hypothesis wrong. Thus, invincible or unfalsifiable approaches for the hypothesis selection process for determining belief do not deserve to be considered as scientific approaches. Popper is a philosopher who is famous for promoting the idea that the scientific process should be falsifiable (Ref. 6).

Humans are often highly motivated and when the motivation is for a good cause, the motivation can be a good thing. However, motivation can also make one biased in their hypothesis selection process for determining belief. For example, often people want to maintain a certain beliefs for personal reasons because of the consequence from changing their beliefs such as negative emotions. For example, they may want to be able to deny they have a problem such as alcoholism when it would be painful to admit it. Often in these cases in order to maintain their belief, people develop an artificial invincible defense where they can avoid the implications of the evidence. For example, they may claim there is no reason to believe any scientific argument that contradicts their personally preferred beliefs.

If someone is not interested in questioning their presuppositions when they can question them, then it is at least questionable what is their primary motivating interest; a personal interest of wanting to hold onto their presuppositions or an objective interest in determining the truth.

I do not think anybody is a perfect Presuppositionalist or unbiased scientist; however, I think a honest thing to do whenever one is considering their beliefs is to honestly ask if they are thinking more like a Presuppositionalist or an unbiased scientist. This should give better insight into themselves as they better understand their own presuppositions and why they hold onto them.

## **5.5 Public versus Private Principals**

Public principal people state their true values publically and they follow them so they are consistent. Private principal people publicly claim certain values, but not their true values because they think they are too selfish to present publically. This becomes evident with their changing their public positions based upon how changing circumstances can affect them personally.

## **6. EXAMPLES OF OBSTACLES TO THE RATIONAL APPROACH**

There are three main categories for examples of obstacles to the rational approach. The first is for cases where the claim is about a concept that does not necessarily involve any claim or fact about the real world. For example, there are many mathematical formulas or logical principles that are not related to anything about the real world. These claims are defined as "abstract" claims. The second category is for claims specifically about the real world that exist. For example, it may be a claim about how many people live in a certain town or if a certain sickness is terminal. These claims are defined as "reality" claims. The third category involves issues about whether something is neutral, right or wrong morally. According to Ref. 1, morals are rules set-up to promote or diminish certain "values". A value is something that is considered important and given priority to. The rational criterion described in Section 3 inherently make no claim about the importance of things; thus, morals involve some presumptions about what is important. Given the presumption about what is important which defines a value it is potentially possible as described in Ref. 1

to rationally evaluate if a certain moral does promote or diminish a certain value. Claims about whether or not something is moral are defined as “value” claims. Claims can involve just one of these categories or could involve a mix of these categories. For example, the question about whether or not a glass contains deadly poison is a “reality” claim; however, the question about whether or not it is right to make someone drink it involves “values”, that depend upon the “reality” claim of whether or not the glass truly contains deadly poison.

## **6.1 Business**

### **6.1.1 Salesman**

The capitalistic society has created a huge army of professional salesman and just about everybody has learned techniques of selling things whether products, services or their own views. Section 5.2 can help to identify if the salesman is presenting a spinned story. Also, Section 4.1 can help to check out the salesmen who often claim they are experts in the field.

Salesmen can motivated to influence other people for personal advantage rather than being motivated to determine the truth. Salesmen may not need evidence that the claim is true, they can just makes claims as long as they think the claim won't be exposed as false or the claim has not yet been proven false. Unsubstantiated claims can be exposed by asking for the reasoning for their claims.

Scientists acting with integrity would be motivated to determine truth. So before making a claim they would work to see if the claim is false by critical analysis. Thus, they should only make claims if they are sure it is true. Thus, when asked for evidence they do not need to be defensive, but can present the evidence because typically they already did the homework prior to making claim. Scientist typically do not mention adjectives that add exaggeration, rather mention qualifiers to show the limits of the known.

#### **6.1.1.1 Auto Repair Man**

I have an example for my personal experience of an auto repair man that was obviously spinning a story for his advantage and my disadvantage. The auto repair man said my brake pads need to be replaced so I went over and looked at them and asked him to tell me why. He told me it was based upon his “years of experience”. I asked him what criterion he had developed such as pad thickness or surface texture. He would not inform me of any criterion, he just kept saying based upon my “years of experience” Then we got out the new set of brake pads. I measured their thickness precisely with a dial caliper and measured the thickness of the pads on my car and found their minimal thickness of the old brake pads to be at least 50% of the new bake pads. So the old brake pad were no more than 50% used. I asked him what he thought about it and he just kept saying that they still needed to be replaced based upon his “years of experience”. Obviously he knew he was making a false claim and trying to manipulate me into thinking my brake pads needed to be replaced when they did not. In fact previously when he had asked to replace my other brake pads which were actually low, he did show me they were low in thickness; thus, he truly knew and would follow the appropriate criterion at least when it was to his advantage. I did not have my brake pads replaced and I have never gone back to his shop since then.

The “years of experience” statement provides nothing for someone to check out and verify some observation about the car; thus, it provides an unfalsifiable approach where he could just always say “years of experience” and not direct the customer to anything that can check out his claim. However, with just a little bit of practical knowledge and reasoning the intent in this case to manipulate the customer could be exposed so the customer was not taken advantage of.

### **6.1.2 Stock Market**

According to Ref. 4 there is a rational way to value a stock. There is an abundance of money interested in multiplying itself and people in the financial community interested in manipulating stock prices for their own advantage. This creates as explained in Ref. 4 all kinds of obstacles to getting the proper information to rationally value a stock and for the stock market itself to behave rationally.

### **6.1.3 Buddy Systems in Management**

Since there is so much money involve with corporations there develops a lot of motivating factors other than the unbiased interest in rationally determining the truth about claims and trying to be consistent to the truth and fair to all those involved. In many but not all cases, it is an advantage for a high level officer in a corporation to place under him those people that would follow his directions that would help him to maintain his position and control over the areas he is assigned to. If the officer can select people that are loyal to him even if they know his directions are not what is best for the company or society as a whole, then he has arranged as best possible an invincible hold on his position. Managers who do not have the confidence that they can be one of the best for their position or have as their highest priority maintaining their power and control are interested in arranging these sorts of situations where their reports will always follow in line with keeping him in power. This means the officer prefers to select friends that he

thinks will have this type of loyalty rather than select people on the basis of who would do what is best for the company or society as a whole. People who want to stick to their good values or try to be consistent with what is rationally determined true have independent principles that may not always help the officers control over his position. For example, an engineer could find a hidden weakness in a design of a product that would greatly cost the corporation to fix. Since customers being aware of this flaw would be discouraged from buying more products from the corporation, it would be in the short term interest of the officer to keep this information secret; thus, encourage the engineer to not report the flaw in the design.

Often in business one is forced to deal with unsubstantiated claims because of pressures associated with business such as manager insisting on making false claims to give the company an advantage. If an employee is pressured by their management to make false claims; for example, job termination threatened, then one way for the employee to deal with these situation is to document the evidence in an official company report so that the manipulative managers are aware that their corruptive pressure could be exposed.

## **6.2 Selective Presentations in Scientific Publications**

There certainly are many scientific publications that present valuable information. However, there are many case where scientific publications are published more for just the reason that professors or graduate students are supposed to publish something. Few people like to publish a failed experiment, so failures are often not published, just success which can be misleading. For example, my job is to determine the correct theory on strength of composite holes in planes. There is one popular theory which is published in Ref. 5. Of all the publication I read while in school the data always matched well. However, at my company our data hardly ever matched the theory well. It became apparent to me that there probably was many cases where graduate students ran experiments where their data did not match the theory so they just did not publish them because few people like to publish a failure. I am sure this sort of selective publishing occurs in many scientific fields which result in a false impression of success. This is one of the reason why I think an objective scientific evaluation considers complete set of databases, rather than a biased selection just the data which is successful. The guidelines I present in Section 3 and 4 could help some to avoid being misled by such selective publishing.

## **6.3 Personal or Social Issues**

The human mind has a great ability to imagine. This is especially evident in children. In adults the imagination can also play a big role in developing their beliefs. Sometimes people develop fantasies that allow them to think things are a certain way when they are not. Often there is a lot of resistance and struggle to undo the fantasy. It really challenges a person because it often makes them realize they do not really have something they hoped for or desire and causes them to accept something they do not prefer.

### **6.3.1 Romance and Relationships**

Especially during the young adult years most people have a yearning for romance or a close partner. Sometimes people will get started in a relationships that they have high hopes for, but in reality the people do not presently have the characteristics to make a good relationships or have some destructive characteristics. The emotions involved with the romance and the hopes of keeping the dream alive can cause the person to not accurately evaluate the true potential for the relationship. They could deny the existence of destructive behavior the partner has or they may not think through what it takes to make a good relationship. Unfortunately, a lot of people end up putting a lot of time and effort into relationships that end up being more destructive when they people could have been building much more constructive relationships in their lives.

### **6.3.2 Peer Pressure**

Especially in the adolescent years when friends often play an important role in forming one's own self-esteem what one thinks their peer's think of them can strongly affect the person's self-esteem. A person who has not developed their own values is really susceptible to this kind of pressure because they do not have their own means to judge themselves so they tend to just arbitrarily accept the judgement of whoever happens to be the peers of the time. This peer based approach to developing one's self-esteem is fundamentally irrational. The fact that changing peers changes the peer pressure but does not change the person, shows that this process is independent of the actual characteristics of the person which shows it is purely arbitrary and irrational. The rational way to judge a person is based upon good and appropriate values. Thus, the peers opinions are actually only of value if they are formed through valid reasoning based upon good and appropriate values. Rather than relying on one's peers, it is much better for the person if they can form themselves the proper and appropriate opinion of themselves through valid reasoning related to good and appropriate values. Ref. 1 presents the Steve Hinrichs' suggestion on using rational reasoning for determining morals (guidelines for behavior) based upon values.

### **6.3.3 Conversation Gimmicks**

Sometimes politicians will avoid tough questions by not really answering the question but responding in a way that just sounds like they are answering the question. Then they will go onto to say what they want to make a good image for themselves or emphasize a point that they wanted to make which may not be related to the question.

When challenged to explain their position people will sometimes say they are not a certain extreme, but are not willing to say exactly where their position falls if they have one. Certainly people have the right to remain silent; however, such a response avoids a transparent conversation that could provide the opportunity for people to really understand each other.

### **6.4 Fear**

One of the strongest emotions that causes people to be irrational is fear. In the moment of strong feelings of fear people can be completely captivated by the possibility of something about to occur. This can cause them to be distracted from thinking things through and using appropriate reasoning. In such a state of mind a person is more prone to be irrational.

In 1942, German submarine U552 was depth charged by a American B-25 bomber. The depth charges did damage to U552 and it started sinking. The crew became frantic as U552 kept sinking. They all thought that they were going down to the bottom of the sea which would kill them all. This caused so much fear that the crew assumed the worst that there was no hope. However, as U552 was dangerously deep at about 230 feet Curth Claus realized that they had forgotten to blow the water out of the ballast tanks which would keep U552 from sinking further. They did blow the water out which caused the U552 to float back up to the surface so they all survived.

The U552 crew was so captivated by the possibility of them soon dying that they forgot to think through the proper procedures and consider the other possible hypothesis such as the ballast tanks were not blown. In a state of fear, one's mind often gets fixed on some negative scenario about the impending doom which distracts them from rationally thinking through all the possibilities to determine the truth so often instead they just end up reacting to their emotions.

### **6.5 Religion**

Religious interest often comes from an interest in discovering if there is a meaningful purpose for humans which most people have. Religion is a part or has an influence in most humans cultures so it's effect in humans society is quite significant. A strong religious interest can be a distraction from thinking through an issue rationally or accepting the implications of rational reasoning. Many religions make historical claims about the past and even claims about the future through prophecy. Also, religions typically make claims about morals and values and often makes super natural claims. Rational reasoning can also make claims in these same areas; thus, for cases where both religion and rational reasoning make claims about the same issue, rational reasoning could be used as an independent check of the religious claims. Ref. 1 explains how rational reasoning can be used to derive morals from values so it could be used to check if the religious morals are consistent with certain values. Ref. 2 explains how religious claims about reality can be checked by what rational reasoning determines true about reality. Also, Ref. 2 presents a rational method to identify if there is evidence for the intervention of the supernatural which could be used to check if there is objective evidence supporting a super natural claim made by a religion.

Religion is not necessarily irrational and according to Ref. 2 there can be some rational basis for a religious faith. In fact, as explained in Ref. 1, for there to be a real fundamental basis for a meaningful explanation for humans, there must be a supernatural intelligence that really had a purpose in mind for humans.

### **6.6 Politics**

It takes a highly motivated person to get involved with politics enough to the point of getting elected. Often this motivation comes from an interest in being in a position of power. If this is the primary interest as it often is, then the politician's own personal interest for political power are likely given more importance that the interest of the subjects. This often motivates the politician to suppress rational arguments that indicate the politician is putting his interest over the interest of the subjects. This way the politician can keep a large portion of the subjects thinking he is more interesting in their interest than the politician really is. This helps the politician to maintain his goal of being in a position of power or personal agenda. Politicians often present spinned presentations to make themselves look more attractive and their rival less attractive.

### **6.7 Media**

The media (movies, television, newspapers and radio) is the main source of information for most people. The media is full of people who are highly motivated about expressing themselves. Many of them have thier own personal views they prefer to promote. This motivation can be beneficial because of the extra effort people in the media give

to their task.. However, this extra motivation can also cause biased presentations that mislead and hinder the rational process of accurately determining the truth. The most biased presentations usually involve issues where there is the most personal preference such as political and social issues. The free press condition is quite advantageous because it provides the opportunity for extensive independent cross-checking of stories from different news organizations. Thus, a lot of different news organizations reporting the same thing about an event is a good sign that the report is credible. A lack of consistency between news organizations or verification from actual facts can be a sign of a lack of credibility. I think the McNeal-Leher news hour is one of the most objective. They often allow experts from both sides of the story make their case on their show which is a good sign that the McNeal-Leher show is interested in fair and accurate presentations. Cases where just one news organization presents a story without verification and the conclusions are controversial and involve social or political issues are candidates for being biased.

Talk show hosts are some of the most highly motivated people in the media. They have a love for discussing controversial issues and are prone to making unsubstantiated claims. Talk show hosts have the lowest credibility as a reliable source for presenting accurate unbiased information. There are many documented examples of popular talk show hosts putting a spin on a story just to make their positions appear more credible or captivate their audience. For example Bill Handell.

### **6.8 Name-calling**

Often people use adjectives to characterize others in a way that is not accurate, resulting in a misleading characterization of that person. Sometime this is done intentionally to unfairly dismiss or misrepresent the person. Other times it is done unintentionally out of a misunderstanding or false information. The adjectives are often general stereotypes with a negative tone such as "ridiculous", "old-fashioned" or "backwards". General stereotypes such as these typically mean quite different things to people and most of the time there are much better ways to describe a person without adding negative characterizations that may not be accurate. A technique often used is to assign a negative adjective to a position that insults the other to make it sound as if they have no credibility and should be given no respect. For example, a politician may characterize a position that goes against his as arrogant or selfish, when he may be just wanting to maintain his positions for essentially just his own selfish political gain. Certainly there are times when for ease of communication stereotypes or general adjectives should be used. However, they should be used in a way that is accurate and do not mislead, otherwise they are confusing and hinder the rational process of accurately determining the truth about people.

Especially when characterizing a person in a negative way, first it should be definitely determined if the characterization is accurate. Second the purpose of mentioning the negative characterization should not be to hurt the person, but there should be some good purpose such as trying to encourage their improvement or protecting others from the negative characteristic.

## **7. Rationally And Respectfully Dealing With Non-Rational Approaches**

If someone is aware that there is evidence that some claim is false that another believes is true then there is a difference between these people that could possibly be resolved through communication. If it is an area of personal interest for the person that believes the false claim, then conflict could arise through the communication so it is beneficial for the person who knows the truth to use special skills to minimize the defensiveness which would distract from a constructive conversation. The person who knows the truth should be prepared to give a clear explanation of the reasoning why the person's false belief is indeed false.

A key to initiating the conversation in the best way is for the person who knows the truth to start the conversation in a way that the other person can see that they are just interested in helping them see the truth or promote some good value they mutually share rather than the person with the false belief thinking the person who knows the truth is just trying to show they are wrong or hurt them in some way. It is best to have the person with the false belief discover the truth for themselves rather than being told to just accept it. Thus, it is better for the person who knows the truth, to present the data and the reasoning to the person with the false claim so they can convince themselves of the truth, rather than just accept someone else's statement. If possible it can be helpful to show the person with the false belief where they accept in other beliefs the reasoning that indicates their false belief is not true so that they can see their inconsistencies.

If the person with the false belief has hidden motivation or just doesn't have the ability to understand, then they may reject the evidence even when the obvious is explained to them. In such cases other techniques may work better. However, one who knows the truth should not give up so easy, it is difficult for humans to maintain their false positions when presented with a honest confrontation with an obviously strong case that something is true or false.

## 8. BENEFITS OF USING RATIONAL APPROACH

The rational approach provides a basis to gain an accurate understanding of the truth about reality. This can help in many ways to deal with reality better. Science has discovered many things that have been beneficial to humans and help them make better decisions. Dealing with a honest and real understanding of oneself helps to address one's real problems, real needs and be in a better position to make improvements in their own life and make better decisions.

Ref. 1 presents a way through rational thinking to develop morals that support rather than diminish certain values. For example, a rational person before making a judgement on a person will first make sure that the judgement is true. Thus, they will first respectfully try to understand the person which is beneficial in developing and improving relationships. The more people use the rational approach the more likely their beliefs about reality will agree which reduces the likelihood of counterproductive conflict between people.

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