

This paper will examine rationality, looking at it on a macro and micro level. By utilizing philosophical and scientific modes of evaluation, we should end with a clearer idea of what rationality means, or at least with a better idea of what it doesn't mean. The body of this paper should provide you (the reader) with a decent understanding of what we call "Rational thought", but please do not skip the conclusion: it is a crucial portion of the paper, not just a summary of all the information stated but a synthesis of it.

Rational Choice Theory

Housed within the academic spheres of sociology, economics, and politics; Rational Choice Theory provides us with one model for rational thought, postulating that people behave the way they do because they believe their chosen actions have more benefits than costs.

Assumptions of Rational Choice Theory

Completion - All possible actions have varying levels of value.

Option A > Option B > Option C

Transitivity - In respect to the above values:

Option A > Option C

Independence of Irrelevant Alternatives - A 4th Option, X, won't change the order of the other 3

Option A > Option X > Option B > Option C

Exchange Theory

Exchange Theory is Rational Choice Theory applied to social interactions. It looks at society as a series of interactions between individuals and is used to describe (and predict) many types of interpersonal interactions.

Assumptions of Exchange Theory

- People seek to rationally maximize profits
- The more often some reward is available, the less value the reward has
- Actions occur within social norms
- Most human fulfillment comes from other people
- Standards people use change over time

A Critique of Rational Choice Theory and Exchange Theory

At a first glance these two theories establish a solid basis for evaluating rational actions within a population of humans; however, a closer look proves them quite erroneous. The hidden assumption at the heart of Rational Choice Theory is that it is rational to value that which is

being taken into account during any given cost-benefit analysis. So, while the framework of Rational Choice Theory may provide a strong basis for classifying thoughts as rational or irrational, relative to the person, it only shows that one faculty of conscious beings is cost-benefit analysis. Perhaps a person can think rationally without believing only in objective truths, their brain a perfectly functioning oven into which a hodgepodge of impure ingredients is inserted, some measurements slightly altered to fit their taste, some ingredients regarded as frivolous and excluded from the recipe. Out comes a pastry, one that suits their tastes and one that is influenced by their culinary experience. The possible issue with this being that people have different tastes. No matter how well baked one's pastries are, no matter how rationally thought through a sentiment is, if the ingredients which go into the product seem rotten it is unlikely the recipient will enjoy their meal. Evolution of thought is impeded by the histrionic breed who runs at the first malodorous whiff of another's cooking; conversely, it is aided by the well mannered class who sits down for a meal, digests the pastry, and discovers the value of each and every ingredient that went into it.

Exchange Theory and The Economy of Thoughts

Exchange Theory takes into account the reality of a greater sized population to evaluate rationality. It looks at the influence of social norms and values on human decision, and it claims that people are likely to act in a way that results in them receiving benevolent responses and goods from others. Despite most communities functioning how Exchange Theory suggests, what is considered rational widely differs from one to another. Exchange Theory, similar to Rational Choice Theory, reveals a mode of thought which most people have the propensity to utilize. This theory can describe the way an economy of thought works and how it influences a society, but that doesn't warrant categorization of the central ideas of that economy as rational or true.

Like every economy, an economy of thought evolves and maintains a mutual dependence on those who it is comprised of. Being dependent on humans that have organized themselves into a hierarchy (which is almost always the case in a society) means that the upper class of a society has a greater influence on what ideas are valued and which are repudiated within said economy of thought. Furthermore, seeing as the higher class often strives to maintain their standing within a society, it makes sense that the economy of thought would be mediated by the institutionalization of knowledge and a subsequent high price required to receive a proper education. This reveals how an economy of thought could be related to an economy of money. There is good that proliferates from a concentration of brilliant minds working to sharpen the spear of knowledge; however, blatantly disregarding sentiments from people of different backgrounds does to a population of thoughts what eugenics would do to a population of humans. To immediately disregard the value of a sentiment held by a lower class because it lacks the same rationale is to objectify one's own reasoning and to deny that there is not an objective truth central to ideas related to the human condition. This is the issue with looking at rational thoughts on the scale of a society: just because an idea is backed by its categorization of rationality by the controlling class doesn't necessarily mean it truly is rational. After all, sentiments are really just suppositions confined to what is known by the thinker or the group of said thinkers.

Defining rationality through the lens of Exchange Theory, thinking thoughts that are valued for their reason and acting in accordance with said thoughts can lead to the development of multiple modes of cogitation within the classes of a society. Often times, the upper class denies of the truth and rationality that is intrinsic to propositions of the lower class. Ideas shouldn't be prosecuted, and people shouldn't be looked down upon for thinking differently. Rationality is really just the standard for behavior of one's mind within a population and a given economy of thought.

Freedom of Thought and Rationality

The official dogma of western society is, "if we are interested in maximizing the welfare of our citizens the way to do that is to maximize freedom" (Barry Schwartz). Schwartz goes on to talk about how this is true because, "we all consider freedom to be something that is in and of itself good, and because if people have freedom they can act on their own to do the things that maximize their welfare" (Schwartz). When Schwartz discusses freedom he uses a very loose definition, but in this paper determinism and specifics liberties allowed by any government or culture will be discluded from discussion. In the economic sphere Schwartz's "dogma of western society," is exemplified by how many options we have in stores. For example, in a supermarket, we are given a slew of options for every sort of food, countless opportunities to exercise our autonomy and curate our kitchen, but this is a curated veneer of freedom. The same few brands receive the money exchanged for your goods, the same few brands control what you eat. Whenever a society designates an activity people are dependent on as an industry (agriculture, manufacturing, etc.), personal freedom is taken away. Perhaps not a freedom people really wish to have but a freedom nonetheless. We learn to shop instead of to farm, similar to how those of this generation have learned to use a computer rather than a typewriter. As time goes on our freedoms, skills, and values change.

If economic liberties, desires, and values are influenced by the structure of society then so is the way you think. If the degree to which we value certain things is altered by society, then so is the outcome of a cost benefit analysis. To give an example, in their pursuit of unachievable beauty standards young people sacrifice the very real value of nutrition and develop eating disorders.

Logical thought, Language, and Rationality

The aim of Kant's *Critique of Pure Reason* is not to establish a dogma; afterall, Kant doesn't try to build anything but rather to deduce pure foundations from which one could construct pure sciences and philosophies. "I apply the term transcendental to all knowledge which is not so much occupied with objects as with the mode of our cognition of these objects, so far as this mode of cognition is possible a priori" (Kant 16).

In Immanuel Kant's *Critique Of Pure Reason* he proposes the concept of "a priori"(Kant). An a priori is knowledge existing apart from empirical observation and all sensuous experience: it is foundational knowledge. Kant gives criterion for an a priori: "the proposition must contain the idea of necessity in its very conception," "the proposition can't be derived from any other proposition except from one equally involving the idea of necessity," and "the proposition must contain strict and absolute universality." An a priori is supposed to be

antecedent to empirical knowledge, but it is not antecedent to one's existence. This means an a priori is a self-contained or self-evident truth, in which case, to become conscious of such a truth would be to introspect. The wonderful thing about this is that supposedly you don't need to go very far to find foundations for knowledge.

An a priori is elucidated by our observation of the effects it has on the world and our observations of the world are denoted with language. Therefore, a language capable of explaining empirical observation of the world must precede knowing what an a priori is. This brings into question whether or not what is considered to be a priori knowledge pertains only to the semantics of a language, or a priori knowledge could be laws of physics that one developed an awareness of through the simultaneous observation of cause and effect. In regards to the prior possibility, If the concept of a priori knowledge always ensues linguistic ability, containing its own syntax, then logical foundations of knowledge, a priori, could be confused with empirically deduced rules hidden in the semantics of the language. If this confusion were to occur then people could falsely validate sentiments communicated through that language because the sentiment's logical validity is measured using the false rationale deduced from a language. Using linguistic knowledge to analyze the rational validity of a sentiment communicated through language doesn't prove that it is rational, it only proves whether or not the author/speaker followed the arbitrary laws of that language. For example, in 18th century Europe, patients who were sick were regarded as being immersed within a disease whereas in 19th century Europe people were talked about as having a disease inside of them. This illustrates how even scientific jargon (commonly seen as a fairly objective way of speaking of things) can change with the evolution of ideas, and with it the way things are communicated, and perceived. In regards to the latter possibility of a priori knowledge being empirically deduced laws of physics, it would follow that a priori knowledge is not self contained knowledge intrinsic to humans but rather truths deduced from the external world. Thus, a priori knowledge couldn't be used to label an idea as rational because rational thoughts must be the result of the majority's rational cogitation unadulterated by subjective observations pertaining to the individual.

The phenomenon that is math's compatibility with the minds of people from all sorts of linguistic backgrounds shows that logic, deductive reasoning, a priori knowledge, etc. belongs to all and exists apart from the syntax of language. Math, which relies on logic and erects undeniable proofs, can be categorized as purely reasonable or transcendental thought. Although not particularly good at describing the human condition, it does a fabulous job at predicting physical happenings (physics) as well as aiding cost benefit analysis through statistical analysis. Attempting to use pure logic or mathematics to navigate one's life would itself be the result of some fear of acting irrationally, the motive to live in a mechanical way itself a result of an empirically gained bias against acting differently. Thus, the motivation to act or think in even the most rational way is the result of a subjective bias.

The syntax of language may be the best sort of neurological software one can be programmed with, allowing expression and interaction with both the logical and sensuous world; afterall, the human condition is heavily influenced by both worlds. Like any software it is likely to update and become better at what it does, describing the human condition. However, it seems likely that it will always have limitations to its use and what it is describing.

Dreaming and Rationality

Every night you close your eyes and descend into a state of consciousness far from what is deemed rational. Occurring during REM sleep, dreaming was barely understood until the early 2000's when MRI technology (which provides detailed images highlighting location and amount of brain activity) came around. Prior to the discovery of the true functions of dreaming and REM sleep there were many hypotheses of what dreams were: some cultures believing dreams to be messages from God(s); Freud hypothesized that dreams were means to experience suppressed desires; and a large portion of the scientific community believed that dreams were simply epiphenomena of REM sleep. Now though there is an evidence based understanding of dreams revealed in Matthew Walker's book *Why We Sleep*.

Functions of REM Sleep

REM sleep has 2 main functions

- 1) Nursing our Emotional and Mental Health
- 2) Problem Solving and Creativity

REM sleep benefits the mind in the 2 aforementioned ways, but, in order for it to fulfill these tasks dreaming, and dreaming about certain things, needs to happen simultaneously.

The Brain During REM Sleep

“During REM sleep several regions of the brain are reactivated: the amygdala & cingulate cortex (emotional centers), visuospatial regions at the back of the brain, the hippocampus and surrounding regions responsible for autobiographical memory, and the motor cortex” (Walker). During REM sleep there is also a significant decrease in circumscribed regions on the left and right sides of the prefrontal cortex (responsible for logical and rational thought). Therefore, dreaming can be described as strong activation in visual, motor, emotional, and autobiographical regions of the brain and a deactivation in regions that control rational thoughts. This suggests that emotion specific memory processing was likely, especially because emotional regions of the brain are up to 30% more active in REM sleep. In addition, the brain stops producing norepinephrine (noradrenaline) which is a stress related chemical, this allows for emotion specific memory processing in a stress free environment. Furthermore, a person's propensity to cope with, identify, and think emotionally is fine tuned by the process of dreaming and REM sleep.

Dreaming As Overnight Therapy

Robert Stickgold, a professor at Harvard, designed an experiment that would determine the extent to which dreams were a continuation of the previous day's events. For two weeks Stickgold had 29 adults keep logs of the events and emotional concerns of their day as well as a log of their dreams. When the reports were compared, only 1-2% of dreams contained a clear rerun of the previous days events, but, between 35-55% of dreams contained the same emotional themes and concerns that were logged during the day. This led Matthew Walker of UC Berkeley

to predicate his theory of overnight therapy. In Walker's book, *Why We Sleep*, he proposes that when we sleep it is, "to remember the details of those valuable, salient experiences; integrating them with existing knowledge and putting them into autobiographical perspective," and "to forget, or dissolve, the visceral, painful emotional charge that had previously wrapped around those memories" (Walker).

To test his theory Walker had a group of young adults view emotional images in an MRI machine, 12 hours later after ½ the participants had slept they were all shown the same images in an MRI machine. Both the emotionally subjective responses and the MRI readings supported Walker's theory. When the group who had gotten sleep viewed the images a second time they showed a decrease in response from the amygdala (emotional center), as well as an increased response from the prefrontal cortex (assists in logical thinking) whereas the group that didn't have the opportunity to sleep didn't. This goes to show that dreaming and REM sleep are essential steps in the process of getting over harsh negative emotions.

Another study conducted by Dr. Rosalind Cartwright also supported Walker's hypothesis... with a twist. Cartwright studied the dream content of people who were experiencing symptoms of depression and anxiety caused by emotionally traumatic events. She started collecting reports close to the time of the trauma and searched for connections to daily life. Up to one year later follow up assessments were administered. What Cartwright found was that those who dreamed about their respective traumas around the time of the event went on to gain clinical resolution of depression and anxiety, whereas those who didn't dream about their traumas remained influenced by their depression. Her studies showed that REM sleep and not just dreaming, but dreaming involved with specific emotional sentiments, was necessary for overnight therapy to be successful.

PTSD

Studies have shown that PTSD affects REM sleep, leads to higher levels of norepinephrine, and at least 50% of PTSD patients suffer from recurring nightmares. Matthew Walker, hypothesized that super high levels of norepinephrine (a symptom of PTSD) disrupts the emotion-stripping capability of dreaming and REM sleep. While doing research Walker found that Dr. Murray Raskind was treating PTSD patients with prazosin, a drug that causes a decrease in norepinephrine levels. While taking prazosin, patients reported a decrease in nightmares or being completely free of them, this supports Walker's theory of dreaming as a means to remove the emotional husk from memories in a stress free headspace.

Dreaming and Problem Solving

Dreaming helps immensely with creativity and problem solving. During the epoch of his life devoted to organizing the elements, Mendeleev ended a stretch of three sleepless nights with a slumber wherein he dreamt of the periodic table. Paul McCartney dreamt up "Yesterday" and "Let it Be" in his sleep. These are just a few examples of feats the human mind has achieved while sleeping. An experiment tested participants' capacities to solve problems after being woken up during REM and NREM (Non rapid eye movement) sleep. When woken up from REM sleep, participants' abilities to solve anagrams increased by 15-35%. Additionally, the participants thought in a more fluid way and said the answers felt like they just popped out. An

additional test was administered to participants, this one testing the participants' abilities to create a logical web of words. NREM sleep and waking states produced very similar results; word maps that had logically and closely related concepts. During REM sleep however, participants created very illogical connections between words. During REM sleep, one's capacity for abstract problem solving is augmented despite the decrease in our ability to think logically. Quite a helpful thing because it allows for an alternative of thinking about problems, problems which may very well belong to an abstract world incompatible with the "logical" one you live in.

Dreaming and Rationality

Dreaming, a mode of thought in which we have irrational thoughts, is required for the maintenance of our sanity and capacity to think rationally,. It also influences our creativity and development of ideas. To give an example of the second type of effect of dreaming on one's beliefs, actions, and values you can look to religions which claimed that dreams were messages from god(s). Thoughts, resulting from the interaction of our brains with the outside world, are the works of many happenings coalescing in an organized or unorganized manner. The human brain, which only devotes a portion of itself to rational thought, is the origin of several of these happenings. This brings into question whether you are capable of pure reason. Afterall, the regions of our brain responsible for so called rational thought do not operate independently from the regions of our brain responsible for abstract thinking and emotions. Perhaps humans have a limited capacity to understand the universe. Perhaps when facing questions with unfathomable answers the creative regions of our brain provide us with a technically irrational but subjectively ostensible solution.

Conclusion

My inquiry into rational thought began with the assumption that there was an easily distinguishable boundary between reality and illusion. Despite neurological wiring playing a prominent role in all that you do, it is very fickle, and using one of many disparate formats of cognition to categorize a thought as rational or irrational could in part be based on a prejudice of the brain favoring its current mode of cogitation. This holds true not only for the waking, logical, mode of thought but for REM dream states where it is rare to acknowledge to oneself that the reality they face is in fact driven by what they would commonly deem irrational thought. Seeing as rationality can't be defined by whatever mode of thought is facilitating our thought process, it only seemed fit to analyze the meet of our thoughts, language. But language seemed too fickle as well, empirical deduction and thought stemmed by our limited vocabulary and the semantics of a language. Semantics and jargon of the sciences pertaining to whatever epoch we live within, not to mention the effects of enumerable cultural biases on the motive behind our thoughts and the variations in our valuations which inevitably alter the outcome of any cost benefit analysis. It seems likely that rationality, like capital T truth, is a construct. A construct utilized to normalize and constrain human thoughts, and actions to the confines of a culture or society.

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