

**Theory: Two Cognitive Biases That Greatly Influence Political Beliefs are Cognitive
Mechanisms Created Via Natural Selection**

Hypotheses

Myside bias (the tendency to base one's beliefs on one's existing convictions, including political party alignment), as well as *the tendency to base one's beliefs on the beliefs of one's associates*, are two dominant and highly pervasive cognitive biases that significantly influence political beliefs.

It is hypothesized herein that *myside bias*, in conjunction with multiple forms of "mis-thinking" that facilitate and fortify myside-biased beliefs, are together a natural selection-derived cognitive mechanism. This cognitive mechanism was designed by the process of natural selection to facilitate group acceptance, in-group flourishing, and out-group antipathy, all goals of significant importance to the survival and reproduction of our human ancestors.

It is also hypothesized *that the tendency to base one's beliefs on the beliefs of one's associates*, plus multiple forms of "mis-thinking" that facilitate and fortify beliefs influenced by this cognitive bias, are together a natural selection-derived cognitive mechanism. This cognitive mechanism was designed by the process of natural selection to facilitate learning from others, another goal of critical importance to humans throughout history.

While traditionally considered forms of aberrant thinking, reasoning that is myside-biased, and learning that is biased by the beliefs of one's associates, are actually natural forms of thinking for which human minds were designed. Based on the ways in which our brains and our minds were designed, as well as the purposes for which the process of natural selection designed them, open-minded and objective reasoning about our in-groups versus our out-groups, as well as learning via effortful independent research in which multiple points of view are both sought and seriously considered, are forms of thinking for which the human brain and mind are not optimized.

Both cognitive mechanisms make objective political thinking extremely difficult, and for most people, impossible.

Background

If you wanted to maximize the odds of reaching objective truth when forming political beliefs, and/or to maximize objective thinking regarding issues for which objective truth is not a relevant and definable endpoint, a reasonable approach to forming political beliefs (as well as one's beliefs about economic, social, scientific, and other issues that have become political) would include 1) recognizing the ever-present potential for bias and making a conscious, deliberate effort to stay as open-minded and objective as possible; 2) carefully gathering evidence, opinions, and arguments from the most credible sources on each side of the issue; 3) assimilating and analyzing the information gathered, including using "specialized" forms of thinking as indicated, such as probabilistic reasoning, scientific reasoning, and statistical reasoning; 4) spending a significant amount of time reflecting and just *thinking*, and 5) reaching a conclusion that is treated as a working hypothesis, as opposed to a firmly established fact. There are many variations of the above five-step process, but all of the above steps are critical to objective, open-minded, epistemically rational reasoning [1] [2] [3] [4].

You would take a similar approach when determining your overall worldview and overarching political ideology, reading, assimilating, analyzing, and contemplating many diverse political and political philosophical viewpoints before settling on your own perspectives.

Finally, you would again take a similar approach when choosing which politicians, media organizations, and other sources to trust for political information and opinions. You would vet potential sources by carefully comparing the information and opinions provided by those that generally support your existing views with the information and opinions provided by thoughtful sources from the other side of the political spectrum, and by carefully comparing and contrasting the issues and events each side chooses to cover in the first place. And you would constantly remind yourself that the sources you pay attention to – the sources that almost always tell you good things about the politicians and political party you support and bad things about the politicians and political party you don't support – are not honest, objective, and *neutral* just because they reinforce your existing political leanings.

Many people never approach complex political issues, determine personal worldviews and ideological stances, and/or choose information and opinion sources as described above, and of those who do, most do it rarely. Instead, most generally use non-reflective, heuristics-based

approaches that allow one to quickly draw conclusions in which one is highly confident, without going through any of the above-outlined steps [5]. “Confident,” however, does not mean “accurate.” [6]

Judgment heuristics are mental shortcuts that allow one to reach conclusions quickly and without putting in much work, but that are associated with cognitive biases and multiple other forms of “mis-thinking.” [5] As will be explained herein, such mis-thinking phenomena include:

- *Substitution* of complex, difficult to answer questions with simpler questions that are much easier to answer [7].
- Answering of questions – that is, formation of beliefs -- in a manner that is highly susceptible to cognitive biases, such as *myside bias* and the *tendency to base one’s beliefs on the beliefs of one’s associates*.
- *Backward thinking*, involving the gathering of confirmatory evidence and arguments to support the belief one has formed, to create belief-plus-evidence-and-other-reasons narratives.
- *Ignoring contradictory evidence and arguments*.
- Confidence – usually, *overconfidence* – in the belief and the narrative one has formed.
- Development of very strong *belief perseverance*, including clinging strongly to one’s belief and steadfastly refusing to even consider changing one’s mind.

An example will help explain the concept of substitution. In effect, when we form beliefs about highly complex political issues, we often address much easier, simpler questions that we substitute for the original difficult ones, without realizing we are doing so. Consider the following cyclically recurring, complex question: *Is a particular national political leader guilty of the scandal of which they are currently accused?* Instead of addressing this question with the five-step approach outlined above (or a reasonable variation of it), most people in effect substitute and address much simpler questions, such as *Do I think this politician is a good person? Do I support and trust the political party to which this politician belongs? How do I feel about those who are doing the accusing? How worried am I about the prospect of the party I favor losing power and the other side taking over? What conclusions have my friends reached?*

What have I heard most recently from my trusted political information and opinion sources in the media (the ones that almost always tell me good things about the party I favor and bad things about the party I disfavor)?

Myside bias is a pervasive cognitive bias that involves the tendency to “evaluate evidence, generate evidence, and test hypotheses in a manner biased toward our own beliefs, opinions, and attitudes – where the attitudes in question are convictions” [8]. By *convictions*, Stanovich refers to non-testable beliefs that are protected values, highly valued opinions generally stemming from one’s worldview or political ideology, to which one shows “emotional commitment and ego preoccupation” [8]. As examples, one’s beliefs concerning equality, equity, systemic racism, climate change, gun control, abortion, and political party alignment are convictions. Abundant data demonstrate that *myside bias* affects all aspects of our political thinking. While this point is actively debated, it appears to be at least as common in the highly intelligent and the highly educated as it is in everyone else [8] [9] [10] [11] [12] [13] [14] [15]. It is also common (and probably similarly pervasive) amongst the political left and the political right [8] [16].

Backward thinking involves the gathering of confirmatory evidence to support the belief one has formed, to create belief-plus-evidence-and-other-reasons narratives. We tend to think that it’s the other way around – that we collect evidence, and that based on the evidence, we form a belief. It rarely works this way, however, when one utilizes heuristics-based processing to form one’s political beliefs, which is most of the time [17].

Heuristics-based belief formation is not a highly rational form of thinking, epistemically-speaking. That is, it is not a form of thinking conducive to the maximization of objective thinking, nor to maximizing the odds of reaching objective truth. However, it can be considered *instrumentally* rational, in that it does help humans achieve other goals (referred to herein as *instrumental* goals) that are important to them [8]. Examples of these goals include:

- Speed, with minimal expenditure of mental energy
- A sense of confidence, with minimal doubt
- Social goals, such as the desire to be seen favorably by others, group acceptance, group communication, group cohesion, and group cooperation

- The ability to feel good about oneself and one's group
- A sense of purpose, to have meaning in one's life
- Material goals, ranging from food, housing, physical safety, and access to healthcare; to financial security, college educations for one's children, money for family vacations, diamonds, fancy watches, and private jets

Many or all of the above instrumental goals, clearly of great importance to humans in the present day, were in the same or similar form also likely of great importance to the survival and reproduction of our human ancestors during the hundreds of thousands of years during which they evolved. It follows that the human brain and the biological, cognitive mechanisms (defined below) for which it is designed evolved for the purpose of helping our ancestors achieve them. It is reasonable to hypothesize that our brains are designed to "mis-think," epistemically-speaking, because in the environments in which our ancestors lived, thinking this way conferred adaptive advantages related to the achievement of instrumental goals.

Unfortunately, brain development that conferred advantages to our ancestors then may not be advantageous for the discovery of truth now, and may even serve as an impediment.

Evolution occurs in significant part via the process of natural selection [18] [19]. Spontaneous, random genetic mutations (changes in DNA) occasionally result in new physical or biochemical characteristics that confer on the host animal an improved ability to survive and/or reproduce. Descendants with the new adaptation thrive, outcompete, and multiply [20]. Those without the adaptation die off, and the species evolves. For humans, the ability to walk upright and the presence of opposable thumbs are characteristics that evolved over time and that have conferred survival advantages.

Based on principles fundamental to the discipline of evolutionary psychology, the brain evolved similarly, to develop a significant number of specialized information-processing cognitive mechanisms, or *ways of thinking*, that were designed to address specific adaptive problems our ancestors faced tens and hundreds of thousands of years ago. These ways of thinking conferred survival and reproductive advantages. Humans' ability to learn language as a child, simply by hearing words and grammar repeated over and over and by interacting, is a classic example [21] [22]. People are not born with language, and they are not born with the propensity for a

particular language. Rather, they are born with the mental mechanisms that allow them to *learn* language, any language, to understand it and to speak it, simply by being regularly exposed after they are born. In ways that are still poorly understood, physical and biochemical properties of the human brain – its structure, its composition, the presence and distribution of various types of neurons, the ways in which neurons relate to and interact with one another, neuronal intracellular structure and biochemical contents, neuronal electrical properties, the biochemical composition of neurotransmitters – gives humans the ability to do this in a way that separates them from all other species. Humans are not born with language. They are born with brains capable of acquiring language, any language, passively, just by hearing it and interacting with others, that evolved courtesy of the process of natural selection (Of course, humans also developed larynxes designed to speak and ears designed to hear the voices of others [21]). Language is likely an adaptation, a solution to an adaptive problem (or large number of adaptive problems) that by facilitating communication, increased our ancestors' abilities to survive and reproduce [21]. Communication of information “could help with an almost limitless variety of tasks: warning family and friends of danger, informing allies about the location of ripe berries, coordinating a coalition for hunting or warfare, providing instruction for the construction of shelter, tools, or weapons; and many others [23].”

The field of evolutionary psychology is still in its relative infancy. However, it appears that the brain adapted to its environment and evolved in other ways as well, that humans have many other cognitive mechanisms, that confer advantages related to survival and reproduction – or at least, that conferred advantages in the environment in which our ancestors lived as they evolved. Related to political thinking, humans were not born with specific political thoughts. However, their political thinking is likely deeply influenced by their evolved mental mechanisms, by the ways of reasoning and learning for which their brains and their minds were designed for the purpose of meeting various instrumental goals.

Argument

Multiple goals that humans pursue in the modern day were also, in the same or similar form, of critical importance to the survival and reproduction of our ancestors in the

environments in which they lived, tens and hundreds of thousands of years ago. Examples include:

- Group acceptance
- In-group flourishing, including group communication, group cohesion, and group cooperation; as well as empathy toward one's group, one's group's purpose, and one's group's goals
- Antipathy toward one's out-group
- Learning via adopting the views of one's associates

Conversely, many epistemic pursuits that would be helpful in the present day for the maximization of objective thinking and for the discovery of objective truth regarding complex political issues would have been of minimal value to our ancestors. Examples include:

- Reaching objective conclusions about one's in-groups versus one's out-groups
- Learning via the assimilation and open-minded analysis of large amounts of information from disparate sources
- Finding objective truth from short, carefully selected snippets of political information on a wide range of constantly rotating complex political issues most people know little about and that have little to do with their daily lives
- Developing a highly objective and open-minded, extensively-reasoned, and comprehensive worldview and / or political ideology
- Identifying accurate and objective sources about complex political issues that have little bearing on one's day-to-day survival (though this will be a subject of a separate manuscript).

Human reasoning and learning likely evolved to become efficient in the pursuit of the first set of goals. The second set of goals, however, would have had little or no relevance to our

human ancestors. In other words, humans likely have evolved cognitive mechanisms oriented to the pursuit of group acceptance, in-group flourishing, out-group antipathy, and learning by adopting the views of one's associates. No adaptations should exist for the second set of goals.

Myside reasoning, to foster group acceptance, in-group flourishing, and out-group antipathy

For the significant majority of human history, humans lived in groups. Group-based living improved one's odds of surviving and propagating one's genes. Group living enhanced an individual's ability to procure food via hunting and gathering, to protect oneself from predators, to find and build shelter, to reproduce, to protect oneself from aggressive rival groups, and to wage war against rival groups for access to their resources and for additional mating opportunities. For these reasons, our human ancestors had an interest in being accepted by a group and in helping the group to which they belonged thrive and flourish. In accordance with the principle of *reciprocal altruism* [24], helping others in one's group was also beneficial to an individual by making it more likely that others would offer help in return.

Though subconscious, our ancestors had another reason for wanting their group to flourish. For the significant majority of human history, the groups in which humans lived were relatively small. They were likely to include family and extended family, people with whom a given individual was likely to share genetic material. In accordance with *inclusive fitness theory* [25] [20], an individual is motivated to propagate not only one's own genetic material, but also the genetic material of one's relatives, since close relatives share many of an individual's genes. The closer the relative, the more interest our ancestors had in aiding the relative's ability to survive and to reproduce, because close relatives share more genetic material than more distant relatives. Inclusive fitness theory at least partially explains the principle of altruism; their brains are designed to care about the welfare of their relatives (in particular, it follows, their close relatives). The better one's relatives are able to survive and reproduce, the more of one's own genetic material is transmitted.

Antipathy toward one's out-groups, meanwhile, would have led to increased vigilance toward those wanting to steal resources from or even wage war against one's in-group, and to support

for aggressive action against one's out-groups (for the stealing of their material resources, and for additional mating opportunities).

Human reasoning was designed, by the forces of natural selection, for the seeking of group acceptance, for in-group flourishing, and for antipathy toward and distrust of one's out-groups. Reasoning in this manner would have supported the pursuit of multiple instrumental goals, such as group acceptance, group communication, group cohesion, group cooperation, empathy toward and support of one's group, empathy toward and support of one's group's purpose and goals, and the desire to view those outside our groups unfavorably. Ultimately, the pursuit of all of these goals would have facilitated the achievement of material and sexual goals, and to genetic material propagation. There would have been few or no natural selection-related advantages associated with thinking objectively about either one's in-group or one's out-groups.

Myside bias, in conjunction with multiple additional judgment heuristics-based "mis-thinking" phenomena that help facilitate and fortify myside thinking, permeates virtually all of our political thinking and is a biologically ingrained cognitive mechanism. It is critical to the direct and indirect pursuit of multiple instrumental goals.

Basing one's beliefs on the beliefs of one's associates, to facilitate learning from others

Our ancestors had two main ways to acquire knowledge and know-how for the acquisition of material resources, for the ultimate goals of surviving and propagating their genetic material: learning from personal experience, and learning from those around them. Compared to learning only by personal experience, learning from others would have enhanced their abilities to procure food and water, to protect themselves from the elements, to protect themselves from predators, to protect themselves from aggressive rival groups, to wage war against rival groups for access to their resources and for additional mating opportunities, and so on. For these reasons, evolving humans had an interest in adopting the beliefs of those around them, as opposed to simply "starting from scratch" and learning only from personal experience.

Conversely, opportunities for a third way of acquiring knowledge and knowhow, learning via personal study, were (compared to the present day) quite limited. Availability of significant

quantities of information that is not found in a person's immediate physical environment is new. Our human ancestors did not have access to these types of information. For most of human history, there was no internet. There was no television or radio. For the majority of human evolution, there was little or no written language. The printing press did not exist, and there were no encyclopedias and no books. It follows that for most of human history, there was little or no opportunity for our ancestors to search for evidence and arguments from multiple points of view (including from people in their out-groups), to painstakingly compile and analyze and assimilate it, and to reach highly informed and objective conclusions. Rather, our ancestors acquired information via the two other types of learning mentioned above: from personal experience, and by acquiring it from other members of their group.

Human learning was designed, by the forces of natural selection, for adopting the views of those around us. Learning in this manner would have facilitated the support of multiple instrumental goals, such as the formation of beliefs without the expenditure of significant time and mental energy, the ability to feel confident in the beliefs that are formed, as well the direct fulfillment of material needs.

The basing of one's beliefs on the beliefs of one's associates, in conjunction with multiple additional judgment heuristics-based "mis-thinking" phenomena that help facilitate and fortify this cognitive bias, is a biologically ingrained cognitive mechanism. It is critical to the direct and indirect pursuit of multiple instrumental goals.

"Mis-thinking" as useful thinking

Additional "mis-thinking" phenomena associated with heuristics-based belief formation, such as substitution, backward thinking, ignoring of conflicting evidence and arguments, overconfidence, and belief perseverance, all described above, likely aided our ancestors in the pursuit of goals ultimately related to survival and reproduction in the environments in which they lived. This occurred in significant part via facilitation and fortification of cognitively biased beliefs, such as those biased by *myside bias* and *the tendency to base one's beliefs on the beliefs of one's associates*. These phenomena are presented below as if they are all separate and distinct forms of thinking. As will be explained soon, they probably are not.

Substitution. As humans evolved, *substitution* of complex questions for simpler, easier to answer questions (and other heuristic processes) would have allowed them to form beliefs and thereby make life-lengthening decisions (about the procurement of food, protection from the elements, and protection from predators, as examples) quickly, from very limited data. These beliefs and decisions were either right or at least “good enough” most of the time [17]. Perhaps more importantly, substitution questions may have helped guide the mind away from time-consuming, difficult, open-minded, and objective thinking (which our ancestors would have had little if any reason to do), and toward the kinds of answers (beliefs) that would be influenced by *myside bias* and the beliefs of one’s associates, the types of beliefs that would have maximized the odds of survival and reproductive success.

Substitution of easy questions for complex ones in the present day may be our way of “switching” to forms of thinking for which our brains and our minds were designed, for the pursuit of instrumental goals.

Cognitive Biases. Maximum open-mindedness, objectivity, and intensive research into complex political issues may not have conferred survival advantages as our human ancestors learned and reasoned, but as has been explained above, formation of beliefs influenced by cognitive biases such as *myside bias* and *the tendency to base one’s belief on the beliefs of one’s associates* probably did.

Myside bias may have been important to group-living in at least one other way as well. Mercier and Sperber have hypothesized that the primary purpose of human reasoning is argumentation, and that argumentation was critical to group communication, cooperation, and coordination [26] [27]. If so, *myside bias* may also be a cognitive adaptation that helped an individual win arguments rather than reason objectively. In this regard, it would again have been a feature, not a bug, for our evolving ancestors.

Backward Thinking. *Backward thinking*, the identification of confirmatory evidence *after* a belief is formed, to create *belief-plus-supporting-evidence-and-other-reasons narratives*, may have

simply been a mechanism for reinforcing beliefs created under the heavy influence of cognitive biases, such as *myside bias* and the *tendency to base one's beliefs on the beliefs of one's associates*.

Today, it appears that backward thinking is so ingrained, so automatic, that few of us even realize we think this way (and that we are pursuing instrumental goals, not epistemic goals, when we reason in this manner).

Discounting and Ignoring of Contradictory Evidence and Arguments. The tendency to heavily discount or completely ignore evidence and arguments that run counter to the *belief-plus-supporting-evidence-and-other-reasons narratives* we have created, and to our existing convictions, worldview, and political ideology; may be another style of thinking that helped our ancestors cement the cognitively-biased beliefs they formed.

Today, this form of thinking appears to be built-in; as for the case of backward thinking, most appear to be completely unaware they think this way when they form political beliefs.

Overconfidence. The development of *confidence* likely had multiple important functions for our ancestors. Confidence would have allowed them to act, to take life-prolonging (and gene-propagating) measures despite having access to only limited information. *Overconfidence*, however, like *backward thinking* and the *tendency to heavily discount or ignore evidence and arguments* that conflict with the beliefs and narratives one has created, likely helped crystallize what are now considered cognitively-biased beliefs.

Belief Perseverance. It follows that *belief perseverance* may simply be another thinking style for reinforcing cognitively-biased beliefs our ancestors formed in the pursuit of instrumental goals.

Today, belief perseverance leads to one's tendency to treat beliefs as prized possessions rather than Bayesian thinking-derived hypotheses that should be continuously re-evaluated and updated (and sometimes even changed altogether).

The above six forms of “mis-thinking” (which are probably only forms of mis-thinking from the perspective of present-day humans) have been presented as if they are six separate and distinct phenomena. Based on the way in which they have been presented, the reader may even be tempted to assume that when one forms beliefs, these phenomena occur in consecutive order, in the way they have presented.

Modularity has been suggested as a principle by which the brain could have evolved to develop discrete, isolated mental mechanisms, or ways of thinking, that are more or less walled off from each other [28]. It is unlikely that there are discrete modules for each of the ways of thinking described in this section -- *substitution*, belief formation under the influence of cognitive biases such as *myside bias* and the *tendency to base one's beliefs on the beliefs one's associates*, *backward thinking*, the *tendency to reject or ignore contradictory evidence and arguments*, *overconfidence*, and *belief perseverance* – as if each independently developed as natural selection-influenced adaptations to problems our remote ancestors faced. It seems more likely that these mechanisms, all pervasively used in the present day for deriving answers to complex political questions without the expenditure of significant time and mental energy, and all leading to or reinforcing beliefs influenced by *myside bias* and the *tendency to base beliefs on those of one's associates*, together constitute an interactive and aggregate way of thinking that conferred evolutionary advantages to our ancestors. Rather than each developing as separate, distinct thinking mechanisms, perhaps with their own circuitry or modules, once again, it seems more likely that 1) *myside thinking* plus the five additional facilitating and reinforcing thinking phenomena collectively, and 2) the *tendency to base one's beliefs on those on one's associates* plus the other five facilitating and reinforcing thinking phenomena collectively, are two distinct adaptations that facilitated gene propagation. In the present day, in addition, *backward thinking*, the *tendency to reject or ignore contradictory evidence and arguments*, *overconfidence*, and *belief perseverance*, all playing similar roles, may not even be discrete phenomena. They may simply be different manifestations of the same cognitive mechanism(s).

Discussion

In this manuscript, it is hypothesized that for the formation of political beliefs regarding complex issues, *myside*-biased reasoning is an innate way of reasoning, and adopting the views of others is an innate way of learning. Objective thinking about political issues is extremely difficult for everyone, and for most it may be impossible.

For a reader of this manuscript who is not open to the possibilities that their own political beliefs are to a significant degree created via judgment heuristics-based processing, that their own political beliefs are heavily impacted by cognitive biases such as *myside bias* and the *tendency to base one's beliefs on the beliefs of one's associates*, that they engage in the other forms of judgment heuristics-based mis-thinking described earlier that facilitate and fortify biased beliefs, and that biased thinking is natural while objective thinking is unnatural, the hypotheses in this manuscript will not resonate. *How can biased political thinking be humans' innate approach to political thinking, and how can objective political thinking be extremely difficult or impossible, if my political thinking and that of my associates is objective, and only the thinking of those who reach opposite political conclusions is biased?*

It should be emphasized that this manuscript does not speak to the accuracy of one's political beliefs. Rather, it addresses only the processing methods utilized in creating them. It is theorized that the significant majority of people, whether highly intelligent or not, highly educated or not, and politically left-leaning or politically right-leaning, use similar processing styles in reaching their conclusions. This claim could be and should be tested empirically, with aggressive attempts to rigidly account for confounding variables. Controlling for the biases of those designing and interpreting these studies would of course be extremely challenging.

Those who are open to the possibility that the hypotheses put forth herein are valid will realize that virtually none of their own nor their associates' beliefs regarding complex political issues – ranging from whether a favored lawmaker is guilty in the latest scandal of which they are accused, to whether their favored political party deserves credit for today's economic climate, to whether their preferred political information and opinion sources are truly objective and truthful, to whether a society that is more heavily based on philosophical conservative principles would be more or less beneficial to the non-college-educated working class than would a society based more heavily on philosophical progressivism -- were created using an

approach similar to the five-step process outlined in the opening paragraph of this manuscript's Background section.

Once one possesses a set of beliefs related to "day-to-day" political issues (such as scandal guilt versus innocence, policy effectiveness, etc.), multiple deep political convictions, an ingrained worldview, and a firmly entrenched ideological viewpoint that all fit well with each other, it becomes very difficult to see the world from any other perspective. It is very difficult to see the world in ways that would require conflict with one's existing beliefs and perspectives, and with the ways of reasoning and learning for which our brains and our minds were designed. Two analogies are provided.

As analogy 1, consider the heights of two adult male humans, one five feet, three inches (160 cm) tall and the other six feet, nine inches (206 cm) tall. If you are an adult human being, it is natural to immediately consider one of these humans as short, and the other as tall. To a small insect such as an ant, both humans are quite tall, and the difference between them (18 inches, or 46 cm) is essentially irrelevant. Compared to the size of the universe, both humans are extremely short, and the difference is again irrelevant. However, the next time you see an adult male who is five feet, three inches tall, you are likely to see him as short, and the next time you see an adult male who is six feet, nine inches tall, you are likely to consider him tall. It is very difficult to see it any other way.

As analogy 2, the minimally understood neural connections and pathways (circuits) that facilitate the pursuit of instrumental goals can be envisioned as smooth, well-maintained, paved roads through the mountains, while thinking in ways that maximize objective thinking and the odds of discovering objective truth is analogous to veering off the road and attempting to drive through the uneven dirt and rocks and underbrush and trees instead. For most, the natural inclination is to simply follow the road, to go where everyone else is going. Veering off road might take one somewhere more interesting and perhaps even somewhere more worthwhile, but the journey will be much slower and more difficult. Most don't try. For most people, attempting this does not even cross one's mind. Most remain satisfied taking the established, low resistance routes and reaching the destinations to which these established routes lead.

The political thinking of most people is analogous, but while it is relatively easy to see biased thinking in those we disagree with, it is extremely difficult to see it in ourselves. We generally think of our side as enlightened, truthful, correct, and good; and we generally agree with our side's proposals, policies, and political platform. We generally see the other side as unenlightened, untruthful, incorrect, and even bad; and we generally disagree with its proposals, policies and political platform. Most people have spent little or no time in highly mental energy-demanding pursuits such as learning about and reflecting on the point of view of the other side. Few people have legitimately vetted their information and opinion sources for honesty and accuracy. Few people have open-mindedly read diverse political philosophical works, which should serve as the underpinnings for one's preferred political ideology, and few people have spent time in deep reflection while considering both progressive and conservative worldviews. We know this. Yet despite the above, we have significant difficulty seeing the world in any way that contradicts our present perspectives, and we generally don't try. Instead, the significant majority of people remain comfortable with the set of beliefs they have, that lead them to conclude their side is both enlightened and correct, and the other side is both unenlightened and incorrect.

For many or most people, truly epistemically rational thinking may be impossible, or so difficult that one does not even try (or even consider trying), automatically reverting instead to the types of heuristics-based thinking for which the brain was likely designed. For others, epistemically rational thinking may be more natural; or, some may simply have a higher tolerance for mental energy-demanding work, ranging from reading diverse political philosophical works with a wide range of different perspectives, to carefully reading policy proposals and then assimilating and analyzing thoughtful commentary arguing both for and against the policy's merits, to painstakingly reading the totality of scientific manuscripts related to a new scientific issue that has become political. What is clear, though, is that this style of thinking is time-consuming, and it takes a *lot* of work.

Many political issues, such as those provided above in paragraph four of this Discussion, are quite complex. Comprehensively addressing these questions in ways that maximize objective thinking and the odds of reaching objective truth (regarding issues for which objective

truth is a definable endpoint), once again, would require an approach resembling the five-step process described earlier. However, it is difficult to imagine that in the only partially understood environments in which humans evolved over tens of thousands of years, there would have been natural selection (survival and reproductive) advantages associated with this type of approach, especially for issues that do not directly impact one's daily life. There is therefore little or no reason, from a natural selection-based standpoint, that modern day humans would be adept at these tasks. The above tasks are relevant only to the very modern, developed world.

Human minds and brains are certainly capable of highly rational processing. Our ancestors likely used logic, critical thinking, statistical reasoning, causal inference, game theory, and even a form of Bayesian reasoning in utilizing limited data to reach conclusions regarding issues and activities relevant to their daily survival, such as tracking animals and deciding when particular plants are good to eat [29] [30]. For many complex issues today, however, especially those not relevant to day-to-day survival and those requiring assimilation of large amounts of information from disparate sources, judgment heuristics-based processing may be biologically ingrained. If so, this would help explain why so many of us find non-reflective, heuristics-based, System 1-dominated (fast, intuitive) [31] [32] [33] [17] [34] thinking so easy, why heuristics-based thinking is the default form of thinking for most of us, and why we find System 2-based (methodical, labor intensive, mental energy-demanding) processing, [31] [32] [33] [17] [34], open-minded thinking, and highly epistemically rational reasoning regarding complex political issues so difficult.

For biological reasons, it may be that objective thinking and the active and truly open-minded pursuit of objective truth may be so difficult for some that they will rarely or ever engage in this type of thinking. For others, these types of thinking may be impossible. It appears that while some people are able to think this way (albeit with a *lot* of effort), they probably cannot overcome heuristics-based, biased thinking completely.

This manuscript has focused on two cognitive biases that are extremely common in political thinking, including *myside bias*, as well as the *tendency to base one's beliefs on the beliefs of one's associates*. While disciplines such as judgment and decision-making psychology

and behavioral economics are beyond the scope of this manuscript, many other cognitive biases have been described. It may be that the use of heuristics and biases-based thinking in general, and the multiple types of mis-thinking that help facilitate it, are “normal” thinking, the kinds of thinking for which the human brain was designed by the hand of natural selection for the primary purpose of genetic material propagation. In the present day, this processing style does help people reach various instrumental goals. However, it is not geared toward maximally objective thinking, nor the discovery of objective truth.

Despite the confidence most of us have in our political beliefs (a strong sense of confidence probably *does* confer a survival advantage, once again, and we are generally great at becoming quite confident in the beliefs we form), there is little reason to think we are naturally proficient at forming them objectively and accurately. When we form beliefs about complex political issues in the present day, we are likely thinking in ways natural selection designed our ancestors’ brains to think, and we are likely subconsciously pursuing goals their brains were designed, by natural selection, to pursue. *Objective thinking (and the pursuit of objective truth) regarding complex subjects may not be one of those goals.*

Gradually, we may learn how to start to think in an actively open-minded and non-biased fashion regarding complex political issues, and with practice, we may get better at it (though as explained herein, this may involve finding ways around our actual biology). In their 2015 book *The Rationality Quotient*, Stanovich and colleagues attempt to describe what truly epistemically rational thought is [34], and more recently, Stanovich suggests some ideas about how to attempt to minimize *myside bias*. For now, though, until better methods are discovered, simply teaching people about the epistemically inaccurate nature of political thinking that almost all of people use — and encouraging them to take their and others’ day-to-day political beliefs, firm political convictions, world-views, and over-arching ideological leanings a bit less seriously — may be the best we can do.

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