

## Perception

by Ronit Herzfeld

*“On the whole, we naturally tend to trust our everyday perceptions; we assume their validity without it even occurring to us to question them. We naïvely believe that the way we perceive things is identical with the way things are. And so, because events and things, including the self, appear to have objective reality, we conclude, tacitly and often without any reflection at all, that they do in fact have an objective reality. Only through the process of careful analysis can we see that this is not so, that our perceptions do not accurately reflect objective reality.”* The 14th Dalai Lama, Tenzin Gyatso

Science is rigorously researching and discovering the genetic and environmental influences on various physical and mental diseases. It is just as committed to studying the flight of a bird, the movement of a whale or the nature of an ecosystem. We recognize that we are part of Nature and as such are continuously seeking to discover its underlying lawfulness. We pursue this knowledge because we are naturally curious, and because we seek to understand our environment so that we can better adapt to it.

What's become apparent to many of us is that the manner in which we have been operating is no longer adaptive. Our pursuit of knowledge and exploitation of our physical world in the service of our survival and adaptation is now putting us in a perilous predicament of bringing us to potential extinction. Yet we don't seem to be meaningfully impacted by this reality.

Deep Human Technology arose out of our recognition that if humanity really got that we are putting ourselves in harm's way, our survival instincts would drive us into action and mobilize all of our physical, intellectual and creative resources to collectively discover ways to prevent us from self-destruction. We concluded that since we are not mobilizing ourselves and our resources in this manner, we must not be registering reality on the level necessary for us to act. The question then is: what's maintaining our inability to truly perceive and act on the current environmental, political, economic and technological threats we are currently facing? We often talk about these threats as we experience climate change, displaced refugees, political, cultural and economic upheavals, new viruses, and unregulated technology. But talk is where it seems to end.

“The real problem of humanity is the following: We have Paleolithic emotions, medieval institutions and godlike technology.” — Dr. E.O. Wilson, Sociobiologist

To answer that question, we need to investigate the source of our behaviors and our apparent denial as rigorously as we do other aspects of our biology and environments. As we stand right now, we do not appreciate or understand the complexity of what brings rise to our perceptions, feelings, beliefs, abilities and behaviors. In fact, the opposite is true; we reach conclusions or opinions about everyday life experiences with extraordinary simplicity. The reality is our perceptions and behaviors are all intertwined with our emotions, memories, cultural/societal norms and neural wiring.

If we studied how we come to perceive and experience our reality with the same rigor we apply to other natural phenomena, we would discover that most of our beliefs and behaviors are determined by biology, not character flaws. We would be far less judgmental, and distrusting, better able to perceive ourselves and each other objectively, and able to meet our challenges with creativity and genius just as we do with the natural world. When we clear many of our simplistic misconceptions and judgements about our species, we will come to truly experience the nature of our mind and its lawful evolution within our biological/spiritual eco-systems. Our self and collective awareness would free us to perceive the world as it IS, and to respond with full access to our emotional, intellectual and still untapped powerful creative resources.

Throughout history, philosophers and scientist have been exploring the nature of reality, recognizing that 'there is more to what we perceive than meets the eye'.

Gratefully, the latest advances in sciences and technology are giving us windows into the invisible eco-systems that the live within us. The latest research in psychology, neuroscience, and the social sciences has made huge strides in understanding how automatic processes in the brain shape our perceptions, our actions and our decision-making. Research also gives us insights into how we can override our biases to bring them more in line with our conscious values.

The following is an aggregate of some of the findings that can help us piece together the evolutionary process of our perceptions, illustrating how our perception is shaped by the adaptation to survive in the unique environments into which we were born, and the impact it has on our feelings, thoughts and behaviors.

1. All of us carry around an invisible frame of reference - a filter through which we experience reality.

### Frame of Reference

"This episode looks at the role our frame of reference plays in how we feel about our lives. The main story is about a recent experiment that took place at Harvard. Researchers wanted to see if they could get people with Asperger Syndrome to see emotional and social cues in the same way that neurotypical people do if they stimulated the brain with magnets (a treatment called TMS). They found that some of the subjects in the study were able to see social cues in the world around them that had been entirely invisible to them before, but only for a brief window of time. We speak extensively with one of the people with Asperger's that took part in the study. Then Alix chats with Daily Show correspondent Hasan Minhaj about their shared experience of grappling with a frame of reference inherited from their parents."

2. We are unaware that our invisible frame of reference constructs how we experience our individual reality - how we feel and what we think about ourselves, each other and the world around us. We don't recognize that it underpins everything we know, what we believe, the actions we take and how we relate to each other. We operate with a fundamental assumption that we experience direct reality. However, the world is not what we think it is or how it seems to be. We believe we see things accurately because we undoubtedly trust our senses.

### Thriving in a World That Doesn't Exist

2:08-6:28 "Perception is everything"

"Visual perception can be misleading: our brains interpret what our eyes see by imposing meaning that may have been useful historically, but may no longer be the case in today's rapidly changing world."

3. We don't recognize that the information that we get from our senses is inherently meaningless and instruction less. It is our brains that organize and ascribe meaning and interpretation to our sensory information. Our brain is picking up sensory information from our external environment, known as exteroception, through our "five senses."

For example, we accidentally touch a hot pot and then automatically, without conscious thought, we rapidly withdraw our hand. Our brain is also picking up, organizing and interpreting internal signals such as changes in our bodily states to help regulate our bodies and anticipate our bodily needs. This is called interoception. For example, your brain is automatically receiving feedback from our body to help keep your blood pressure level.

### [Thriving in a World That Doesn't Exist](#)

6:27 - 7:16 "Information is Meaningless"

### [Interoception: The Secret Ingredient](#)

### [Interoception: The Hidden Sense That Shapes Wellbeing](#)

4. In order to be able to survive and adapt to our environments, and not get overwhelmed by all the sensory information within us and around us, our brain has evolved a survival-based selective perception; we only pay attention to the most critical information that helps us regulate our bodies and quickly adjust our behavior to ensure our physical safety. However, because we are social creatures that live within complex social ecosystems, our physical safety is also intertwined with social acceptance and belonging. Therefore, to ensure that we are accepted and belong, we pay particular attention to critical information from our social interactions and surroundings. This sophisticated selective mechanism enables us to function, navigate and adapt to both our physical and social environments.

### [The Ecological View of Selective Attention](#)

"We hypothesize that, to a certain extent, limiting sensory processing is adaptive irrespective of brain capacity. We call this hypothesis the ecological view of attention (EVA) because it is centered on interactions of an animal with its environment rather than on internal brain resources. In its essence is the notion that inherently noisy and degraded sensory inputs serve the animal's adaptive, dynamic interactions with its environment."

### [Why Our Brains Are Wired To Be Social](#)

"Neuroscientist Professor Matthew Lieberman outlines how social connection is one of the fundamental drivers of human behavior."

5. So how does our brain come to learn what information to pay attention to within our physical and social environments, and how does it ascribe meaning to this information? The answer lies within our memory systems. Our memory systems are composed of what we already know from our past experiences and what we have learned is safe, familiar and predictable.

### [Thriving in a World That Doesn't Exist](#)

7:17 - 14:26 "How does your brain make meaning?"

### [The Proactive Brain: Memory For Predictions](#)

"This cognitive neuroscience framework provides a new hypothesis with which to consider the purpose of memory, and can help explain a variety of phenomena, ranging from recognition to first impressions, and from the brain's 'default mode' to a host of mental disorders."

### [How Memories of Events in Your Past May Affect Perception](#)

"New research suggests our episodic memories may help train our perceptual system."

### [Memory Contaminates Perception](#)

"Imagery retained in the mind's eye can influence visual perception, according to a new study."

6. We each are born into, develop and learn within an environment of relationships; social ecosystems that have their own specific cultural/religious norms and teachings, socio-economic-educational orientations and influences, political beliefs, etc. Children, like all organisms, learn to survive and adapt to their social environments that are oftentimes chaotic, painful and challenging. In early childhood we are constantly exploring, and implicitly learning and then remembering with whom, when and under what circumstances we felt physical safety, and experienced psychological safety through receiving emotional attention, care and comfort.

### [The Foundations of Lifelong Health](#)

"This edition of the InBrief series explains why a vital and productive society with a prosperous and sustainable future is built on a foundation of healthy child development. The video summarizes findings from The Foundations of Lifelong Health Are Built in Early Childhood, a report co-authored by the National Scientific Council on the Developing Child and the National Forum on Early Childhood Policy

and Programs.”

### Young Children Develop in An Environment of Relationships

“Healthy development depends on the quality and reliability of a young child’s relationships with the important people in his or her life, both within and outside the family. Even the development of a child’s brain architecture depends on the establishment of these relationships.”

7. These instinctual and unconscious psychological learnings and adaptations to our individual social environments become imprinted into our memory systems and encoded into the structure of our brains. Children are born hyper-sensitive and absorb every micro facial expression, shift in energy. They brilliantly perceive the social and environmental patterns that will help them feel physically safe while seeking acceptance, belonging and emotional connection. Repeated experiences shape their brains and contributes to the construction of their frames of reference. They become imprinted into their memory systems and continue to organize and solidify their understanding of their physical and psychological environments into adulthood. These frames of reference persist throughout our adult lives.

### Serve & Return Interaction Shapes Brain Circuitry

“One of the most essential experiences in shaping the architecture of the developing brain is “serve and return” interaction between children and significant adults in their lives. Young children naturally reach out for interaction through babbling, facial expressions, and gestures, and adults respond with the same kind of vocalizing and gesturing back at them. This back-and-forth process is fundamental to the wiring of the brain, especially in the earliest years.”

### The Brain Architects Podcast: Brain Architecture: Laying the Foundation

“Why are the early years of a child’s life so important for brain development? How are connections built in the brain, and how can early brain development affect a child’s future health? This episode of The Brain Architects dives into all these questions and more.”

8. The repeated unique interpersonal and social experiences we each had as children provided us with explicit and tacit education of what is right, wrong, good, bad, should or shouldn't, etc. The foundation of our strongly held beliefs and opinions, our feelings and reactions, and the manner in which we understand ourselves and the world are often affected by factors unknown to us. What we don't recognize is that we each have a unique subjective experience of reality, based on the variables and conditions of our particular childhood environments. For example, your mind has constructed a meaning for each word or concept that you evolved through your own subjective experiences; what you mean by love, responsibility or trust is not the same as what those words mean to another person. We assume that others are experiencing reality essentially the way we do and ascribe the same meanings to words, events, and experiences. We operate under this belief until we suddenly find ourselves in conflict or confusion with another person. And then we make them wrong.
9. We are convinced that our beliefs, opinions and feelings are "rational" and "justified" since we believe that we are accurately reading reality. In fact, we are generally misreading reality because we are viewing reality through a frame of reference that was constructed from our past experiences. We cannot see or experience the present moment for what it actually is, because we are projecting our past onto the present.

### Why We Contradict Ourselves and Confound Each Other

The classic economic theory embedded in western democracies holds an assumption that human beings will almost always behave rationally in the end and make logical choices that will keep our society balanced on the whole. Daniel Kahneman is the psychologist who won the Nobel Prize in Economics for showing that this is simply not true. There's something sobering — but also helpfully grounding — in speaking with this brilliant and humane scholar who explains why none of us is an equation that computes.

As surely as we breathe, we will contradict ourselves and confound each other.

10. The very idea that "we are not responding to all of reality" is repugnant to us, because it requires us to see and accept that we don't have a direct experience of reality; to admit that "we don't know" what reality is.



11. From both a psychological and evolutionary biology perspective we have a need to “be in the know” in order to feel a sense of physical and psychological safety. “Being in the know” gives us a sense of control over and predictability of our physical and social environments: “I know what is going on.” Being in a state of uncertainty creates feelings of vulnerability, which expose us to risk and danger, where we may be physically or socially attacked or rejected at any moment. Being in the know, or being right also protects our self esteem.

### Uncertainty and Anticipation in Anxiety

“Uncertainty about a possible future threat disrupts our ability to avoid it or to mitigate its negative impact, and thus results in anxiety. Here, we focus the broad literature on the neurobiology of anxiety through the lens of uncertainty. We identify five processes essential for adaptive anticipatory responses to future threat uncertainty and propose that alterations to the neural instantiation of these processes results in maladaptive responses to uncertainty in pathological anxiety. This framework has the potential to advance the classification, diagnosis, and treatment of clinical anxiety.”

12. To avoid feeling the psychic fear and vulnerability of “not knowing,” we have evolved ingenious psychological defense mechanisms, adaptive tools. One of the most prevalent defenses we implement is “confirmation bias,” where we process information by looking for, or interpreting, information that is consistent with our existing beliefs. This bias is largely unintentional, and it results in us ignoring information that is inconsistent with our beliefs. Hence, human decision making and information processing is often biased because people are limited to interpreting information from our own viewpoint.

### Confirmation Bias in the Utilization of Others’ Opinion Strength

“Earlier this year, a study conducted by Kappes et al., with Dr. Sharot as corresponding author, was published in *Nature Neuroscience* that sought to examine the mechanisms of belief formation in the context of confirmation bias. Behaviorally, the research uncovered that people are more likely, when evaluating their own opinion, to consider the strength of another’s opinion only when it aligns with their own. Dr. Sharot’s team conducted functional magnetic resonance imaging (fMRI) to measure brain activity (based on changes of blood flow) in a brain region involved with reevaluating decisions upon new information gain. They learned that, similar to the behavioral trend, the brain region appears to track the strength of agreeing, but not dissenting, opinions.”



## Confirmation Bias and the Power of Disconfirming Evidence

13. This self-serving and self-protective bias has us each unconsciously seek and acquire information that validates what we already believe. As we mount evidence for our beliefs, we reinforce our experience that we are rational and are reading reality accurately. The unconscious nature of this confirmation bias makes our individual subjective frames of reference hard to see when confronted. In order to maintain our sense of self-esteem, predictability and belonging, we are literally wired to not see or believe that our perceptions are limited.
14. Being social creatures with a need to belong, we are driven to be constantly scanning our social environments, making rapid associations and predictions about people's feelings, thoughts and actions – do they like me? If I make a joke, will they think I am funny? If I bring something to their house, will they accept me? We draw from what we believe is safe, familiar and comfortable from our past social experiences from childhood to predict whether or not others like us or not, and then react in ways to ensure that we are not rejected or abandoned. Our invisible frame of reference is encoded with this survival wiring to move us toward social relationships and interactions that are psychological and emotionally familiar and comfortable and to avoid social unknowns and discomforts that could lead to us becoming socially rejected and isolated.

## The Relentless Pursuit of Acceptance and Belonging

"A great deal of human behavior is motivated by the desire for acceptance and belonging, and a high proportion of people's emotional reactions stems from concerns with actual or potential social rejection. The pervasive quest for acceptance can be seen in the attention and effort people devote to their physical appearance, their efforts to be liked, achievement-related behaviors, conformity, accumulating resources that others need, and generally being the sort of person with whom others want to have social connections. Depending on the context, concerns with social acceptance are typically accompanied by emotions such as social anxiety, embarrassment, jealousy, hurt feelings, and guilt, as well as lowered self-esteem. In addition, people who feel inadequately valued and accepted may behave in ways to increase acceptance, aggress against those who rejected them, distance themselves from other people, and/or engage in symbolic efforts to increase their subjective sense of being accepted. Concerns with acceptance and belonging exert a pervasive, ongoing effect on human thought, behavior and emotion."

## **Additional resources on perception**

[Action Shapes Thought](#) Barbara Tversky

[The Neuroscience of Perception](#) Beau Lotto

[The Biology of Humans at Our Best and Worst](#) Robert Sapolsky