Science and Innovation Funding: Six Important Ideas, Concepts, and Topics

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Introduction

This short essay will present six topics, three taken from both Edge's "What scientific term ought to be more widely known" (2017) and from the World Science Festival's (WSF) "Big Ideas Series" respectively. These six topics, concepts, and ideas are derived from a larger pool and this short essay will argue why these six topics specifically deserve more public attention and funding.

Edge: Antisocial Preferences (Quartz, 2017)

Antisocial preferencing refers to the willingness to make other worse off even when it comes at a cost to oneself. This departure from rational behaviour, or the *homo economicus*, directly goes against the core of many mainstream economic theories. Ilyana Kuziemko (2014), and other scholars, empirically demonstrate how people exhibit last-place aversion. For example, individuals near the bottom of the income distribution oppose redistribution as they fear that redistributing might lower their hierarchical status. This is so even if they constitute the bottom 5% of a country economically, and redistribution would in reality tremendously increase their welfare. In the United States currently, the poorest and unhealthiest states are the ones most opposed to Federal healthcare programs.

Steven Quartz argues that we must understand the contexts that trigger this paradoxical human behaviour, and we agree. The continued antisocial preferencing trap experienced by the poor prohibits fair and inclusive development. We must therefore comprehend the multivariate conditions that give rise to antisocial preferencing to solve the abovementioned societal paradox exploited by the concept of the *homo economicus*. In doing so, communities belonging to lower income groups can be rallied and fortified to call for a fairer economic playing field and more redistribution.

WSF: Spark of Genius? Awakening a Better Brain (Besser, 2015)

One in five Americans is taking mind-altering drugs to fight depression, improve their focus and/or learning ability, or alter other cognitive features. With the occurrence of devices that deliver electric shocks to targeted areas in the brain, this will become unnecessary. Brain tools such as *transcranial magnetic stimulation* (TMS) will provide individuals the ability to profoundly control the cognitive side of their brain. TMS modulates the neural excitability through which, depending on the stimulation parameter, information processing in the brain is either *disrupted* or *enhanced*.

Although this new development in the field of neurology generates aspired new knowledge, physical safety amongst users is not regarded as a priority in the newest electro shock technologies. Aside from this, the development of neurocognitive signatures has caused private data such as passwords and pin codes to be more prone to hacking and other forms of private life control. Still, TMS provides opportunities for individuals to enhance chosen skills while deconstructing any other negative aspects of their behaviour or psychic disorder. Incidentally, negative aspects can be thought of as well, thus implying that funding should be given to both the furtherment of the technologies as well as research on the risks to the public this technology invokes.

Edge: Determinism (Coyne, 2017)[1]

Physical determinism's most important implication is the absence of free will. All living creatures, including ourselves, are constrained by the environment, our genes, and evolution. Dualistic free will, therefore, is an illusion. The phenomenon is supported by empirical studies where people are tricked into thinking they have free will, whilst, using electroshocks, predictive brain scans, and other methods, they are observed to not have any free control at all. Grasping determinism means to come to terms with our inability of choosing otherwise, like coming to terms with mortality.

Jerry Coyne furthermore explains the implications this has for justice; naturally we should remove dangerous people from society- to imprison someone as a form of retribution for making a bad choice, however, is unjustifiable in a deterministic context. We strongly believe that more public understanding of the phenomenon is required. Not because social, physical, or technological *determinism* holds true, on the contrary: we believe strongly in *constructivism, nihilism,* and *ethicality* to shape human outcomes. Yet to oppose physical determinism, which on the virtue of scientific supremacy seems to be regarded as unjustly true, we must publicly debate and discuss the idea. Indeed, communicative action as the antithesis to deterministic futility is required to deter the implications deterministic thinking might have on our justice and moral systems (Habermas, 1987).

WSF: Moral Math of Robots: Can Life and Death Decisions be Coded? (Blakemore, 2016)

Can morality be programmed? Accepting the notion of technological determinism for a moment allows us to contend that the pace at which artificial intelligence (AI) is being developed matches exactly with the dangerous pace that Stephen Hawking, Elon Musk, and others identified in their open letter addressed to limit the development of AI. More recent examples where a person was killed by a self-driving Tesla show the need for morality in robots. If a self-driving car can save three bystanders, or two people in the car, which one does it choose? Does it employ simple utilitarianism, or is it programmed to value the lives of the riders over the lives of bystanders? These questions are debated by computer scientist Fernando Diez, bio-ethicist Wendel Wallach, cognitive psychologist Gary Marcus, and more.

The debate shown by the WSF shows a clear tendency of polarisation; hardcore-scientists believe in the necessity of AI, sometimes only by virtue of it being 'the next step'. Some ethicists and philosophers oppose AI purely on the basis of the unknown and 'doom scenarios'. Therefore, research into the morality of robots is required. Even if robots can be programmed to obey to

moral *code*, does the programmer writing it reflect a type of morality that seen in society? Should the morality of robots stem from a societal majority? Will the morality of robots differ depending on the societal context the robot is created in? These questions demand answers. We do not believe that a next step justifies carefreeness. Implications of new technologies must be considered prior to their introductions into societies.

Edge: The Ideal Free Distribution (Betzig, 2017)

According to the anthropologist Laura Betzig (2017), the concept of the *Ideal Free Distribution* commits itself to redistribution in its most effective ways. This to avoid predators and leave as many posterities as possible behind. In a situation where data and information are incomplete, ideal situations will logically be missed and the distribution of goods is done by an authoritarian system. In a position where information is complete, however, the allocation of certain conditions will comparatively be free and optimal.

Distribution of goods and services were at the beginning of the human time ideal, as human beings moved around with their prey and followed and collected the food they pursued for their families. However, with the occurrence of dynasties, distribution was ruled by an authoritarian system. This change caused the expansion of bodies in places where they were trapped. With the discovery of the *New World*, the movement of humans caused an increase of information through which the *despotism* collapsed and an ideal-free world again was created. Therefore, to accomplish the ideal free distribution in the upcoming years it is important to develop the growth of information, data and the movement of bodies as much as possible.

WSF: Alien Life: Will We Know It When We See It? (Szostack, 2016)

The search for extra-terrestrial life is an important factor when looking for planets that can be inhabited by human beings in the upcoming centuries. During this search, chemists, computer scientists, biologists and even the Pope work together to find out which elements on a planet

signify that living organisms can survive in human-appropriate climates and circumstances. With the use of precise telescopes, the dipping of the brightness of each star in the universe is examined as it exemplifies the signature of a planet. To do so, an examiner is required to analyse 100.000 stars. From these one must be lucky to observe one planet with the appropriate distance to a star and a habitable zone for people to live.

Even though there are living organisms on other planets, it is not yet clear whether these planets have the necessary complex structures to be a habitual zone for a human society. Thus, the criteria for the upcoming years remains the research to the unknown details on a planet that are necessary to preserve complex human life on a planet.

Conclusion

In this short essay we have argued for science funding towards six topics, concepts, and ideas. We have observed that most of these relate to societal or ethical problems that demand urgency in their public understanding and debate. In conclusion we observe that emerging technologies require more understanding of their implications on society prior to their installation. Similarly, societal concepts that have existed as covert human ideas or behaviours, such as antisocial preferences and the idea of determinism, call for more understanding and research.

Endnotes

[1] Incidentally the topic of physical determinism is also discussed by the philosophers like Alfred Mele in WSF's "Mind over Masters: The Question of Free Will." (https://www.worldsciencefestival.com/videos/mind-over-masters-the-question-of-free-will/)

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