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OPINION ARTICLE

Hubris and Sciences [version 1; referees: 2 approved]Eleftherios P Diamandis ¹, Nick Bouras²¹Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, Ontario, Canada²King's College London, Institute of Psychiatry, Psychology and Neuroscience, London, UK

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Abstract

There has been an increasing awareness of the importance of leadership and decision making, including scientists and academics, over recent times. By whom and how decisions are made can have serious implications across all levels of society. Several people have been successful in their life and have been inflicted by excessive pride and self-confidence. There are times when the manifestations of such behaviours demonstrate noticeable signs of narcissism and on extreme cases, hubris. Hubris is an old concept originated from the Greek mythology. The risk of hubris affects politicians, leaders in business, scientists, academia, the military, entertainers, athletes and doctors (among many others). Power, especially absolute and unchecked power, is intoxicating and is manifested behaviourally in a variety of ways, ranging from amplified cognitive functions to lack of inhibition, poor judgment, extreme narcissism, deviant behaviour, and even cruelty. Hubristic behaviour of overconfidence, extreme pride together with an unwillingness to disregard advice makes powerful people in leadership positions to over-reach themselves with negative consequences for themselves and others. As the dangerous consequences of hubristic behaviours become more apparent and well described it is imperative that individuals, organisations and governments act to prevent such phenomena. Responsible leaders, including acclaimed scientists should exercise greater humility to the complexity and inherent uncertainty of their activities and strive to seek out and challenge hubristic behaviours.

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	Invited Referees	
	1	2
version 1		
published 01 Feb 2018	report	report

- Eleni Palazidou**, Queen Mary University of London (QMUL), UK
University of Nicosia Medical School, Cyprus
- Eugene Sadler-Smith**, University of Surrey, UK

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Comments (2)

Corresponding author: Nick Bouras (nick.bouras@kcl.ac.uk)**Author roles:** Diamandis EP: Conceptualization, Resources, Supervision, Visualization, Writing – Review & Editing; Bouras N: Conceptualization, Resources, Supervision, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing**Competing interests:** Nick Bouras was a member of the Advisory Group of Daedalus Trust Eleftherios P. Diamandis holds a consultant/advisory role with Abbott Diagnostics**How to cite this article:** Diamandis EP and Bouras N. **Hubris and Sciences [version 1; referees: 2 approved]** *F1000Research* 2018, 7:133 (doi: [10.12688/f1000research.13848.1](https://doi.org/10.12688/f1000research.13848.1))**Copyright:** © 2018 Diamandis EP and Bouras N. This is an open access article distributed under the terms of the [Creative Commons Attribution Licence](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.**Grant information:** The author(s) declared that no grants were involved in supporting this work.**First published:** 01 Feb 2018, 7:133 (doi: [10.12688/f1000research.13848.1](https://doi.org/10.12688/f1000research.13848.1))

The concept

There will be times when we think that audacity is the route to major discoveries and scientific breakthroughs. How often, however, do we question ourselves if what we know is a real knowledge and not some kind of information? How long will it take for the knowledge that is currently known to become outdated or obsolete? “I learned early in my career the dangers of being too entrenched in what I knew” stated Elisabeth Nabel¹, Professor of Medicine at Harvard Medical School, revealing “how limits of knowledge can be a weakness and how ignorance can be strength”. She continued by saying that “none of us in science and medicine have the answers we tell others we have, because the universe of what we don’t know dwarfs what we do know”.

There are times in our life that we must accept that what we thought to be correct will be redefined. For example, stomach ulcer was believed for decades to be related to stress and proved to be a bacterial infection. There are also times we would feel that our pride was hurt, or our confidence was cracked by facts that we had accepted as certain. There is nothing wrong about being wrong. Consequently, humility is essential to be embedded by all of us in everyday life. We should be ready to accept that most of what we know might change over time.

Humility

Humility is defined by the Oxford dictionary as the “quality of having a modest or low view of one’s importance”. Humility is the element that prevents a sense of over-confidence and exaggerated self-importance and helps to avoid being inflicted by hubris. The Greek philosopher Socrates was proclaiming that “one thing I know is that I do not know anything”, which epitomizes his sense of humility. It is rather surprising that humility is not formally taught at any level of education. Most of us are left to self-discover humility, and many, never discover it. The opposite may happen too. A number of objectively clever, creative and successful people may develop megalomania, which, when left unchecked, can reach the level of hubris.

Humility is necessary in science and technology since the remarkable contemporary advances and discoveries could encourage a feeling of acquired excessive power, with the consequence of developing hubris. Remarkably, some recent discoveries, such as the CRISPR-Cas gene editing technology, may encourage some to “play God” due to their supposed capability to alter the natural abilities of future generations of humans through genomics. In such instances, the discoverers of such technologies forget that they did not really create anything themselves, but they merely understood how microbes developed these tools through millions of years of evolution. The huge financial and commercial pressures affecting scientists in current times, together with those in academia for increased productivity, successful tenders for research grants and high impact factor publications add up to vulnerability of exhibiting behaviour and personality changes or traits manifested as hubris. Many successful people have frequently overestimated their own abilities and believed that their performance is superior to others by imposing excessive pride and self-confidence to themselves.

There are times when the manifestations of such behaviours demonstrate evident signs of narcissism and on extreme cases, hubris.

Hubristic behaviour

The term hubris derives from the Greek mythology, signifying the dangerous combination of over-confidence, over-ambition, arrogance and pride. In the ancient Greek world hubris was considered to be one of the most dangerous traits one could exhibit. In the classical Greek myth when Daedalus and Icarus escaped from the labyrinth in Crete, Daedalus advised his son not to fly too low, in order to avoid being too close to the moisture of the sea or, too high and close to the heat of the sun, as he had used thread and wax to make their wings. Despite this advice, an excessively exuberant Icarus flew too close to the sun and his wax wings melted causing him to fall into the sea. Icarus’ hubris, his disobedience of his father in flying too high, is a cautionary tale about humility and restraint, the danger of audacity.

Hubris has been seen in all walks of life including politics, business, the military, scientists, academia, entertainment, sports and medicine (among many others). In aviation, investigations into fatal plane accidents identified erroneous decisions by the captain whose position of power in the flight deck dismissed concerns by other members of the crew. Moreover the crew often failed to question or challenge the captain’s decisions². In medicine Atul Gawande (2014)³ suggested that the behaviour of doctors medicalising old age and not accepting that life/death is not curable is a sign of hubris within the profession. He argues that doctors should shift away from simply fighting for longer life, for things that make life meaningful. A leading Medical School in UK decided that it is no longer enough to have high grades to become a medical student but would-be doctors must also display humility⁴.

Phenomena of hubristic behavior were possibly present in investigators of at least some of the fraudster studies reported in recent years. Among numerous examples, three articles are cited here one from the physics world and two from medicine. Jan Hendrik Schön rose to prominence after a series of breakthroughs in semiconductors, most of them published in *Nature* and *Science*, which were later discovered to be fraudulent⁵. Hwang-Woo-suk, until 2005, was considered one of the pioneering experts in the field of stem cells and was best known for two articles published in the journal *Science* in 2004 and 2005, where he reported that he had succeeded in creating human embryonic stem cells by cloning⁶. He was called the “Pride of Korea” in South Korea. These reports were later found to be fabricated. Another tragic example of possible hubris was the report in *Nature* of a new and simple way to produce inducible stem cells. The method was soon found to be irreproducible and was retracted, but in the meantime, one of the senior authors committed suicide⁷.

The “intellectual celebrity syndrome” was implied by Winkler (1987)⁸ for writers and scholars who risk seeking to popularise serious ideas or influence contemporary events by transmitting them to the general public in a distorted and unusable manner. Winkler suggested that this phenomenon resembles a disease characterised by the presence initially of a pleasant exhilaration,

followed by celebration, eccentric indulgent and somnolent phantasies. Nobel Prize laureates who undertake projects or accept positions beyond their capabilities was described by Diamandis (2013)⁹ as “Nobelitis”. Diamandis claims that the Nobel Prize seems to provide laureates with reassurance that they hold some super-powers that they did not realise before and that the prize will assist them to go on to even greater achievements.

The speed of communications in contemporary times, combined with the widespread application of social media and easy access to large groups of people, might predispose to both collective and individual hubristic decision making. The consequences of hubristic behaviour can be profound with dangerous consequences¹⁰. Acclaimed scientists should exercise greater humility to the complexity and inherent uncertainty of their activities and strive to seek out and challenge hubristic behaviours.

Mentors are encouraged to discuss hubris and related behaviours with their mentees and stress the importance of humility in their future activities.

Competing interests

Nick Bouras was a member of the Advisory Group of Daedalus Trust.

Eleftherios P. Diamandis holds a consultant/advisory role with Abbott Diagnostics.

Grant information

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Open Peer Review

Current Referee Status:



Version 1

Referee Report 12 March 2018

doi:10.5256/f1000research.15052.r30448



Eugene Sadler-Smith

Surrey Business School, University of Surrey, Guildford, UK

I enjoyed reading this interesting, relevant and well written article.

I think that's its great strength is the focus on hubris in scientific discovery - an area that is currently not written much about. I liked the examples and the arguments and I think they are convincing.

If there are any areas for development maybe the authors could say a bit more about one of the really interesting points that they mention but don't develop - that is teaching humility, this is a really great and novel idea in hubris research and I like the idea of approaching it from a Socratic or Aristotelian perspective.

Good luck I hope this work gets indexed.

Is the topic of the opinion article discussed accurately in the context of the current literature?

Yes

Are all factual statements correct and adequately supported by citations?

Yes

Are arguments sufficiently supported by evidence from the published literature?

Yes

Are the conclusions drawn balanced and justified on the basis of the presented arguments?

Yes

Competing Interests: No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Referee Report 16 February 2018

doi:10.5256/f1000research.15052.r30450



Eleni Palazidou ^{1,2}

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The ancient Greeks recognized the dangers of “overvaluing” one’s self and hence coined the word Hubris (ὕβρις), meaning a highly exaggerated sense of self-importance that is an insult to the Gods.

Anybody in position of power, in any sphere of life and the authors comment on scientists being afflicted by hubris as much as others. Very rightly they point out that scientific knowledge continuously grows and reinvents itself. In fact we can confidently (but not hubristically!) say, scientists will never manage to know everything! The growth of knowledge in every sphere is infinite.

The authors comment on the “intellectual celebrity status” which has afflicted scientists. “Nobelitis” is mentioned as a syndrome of considering oneself as more able than one is, because of the high level of recognition afforded to them, which encourages hubristic behaviour. Is prize giving, in general, feeding into hubris? It would have been good to expand on this.

They recommend the cultivation of humility as a way forward and they urge mentors to teach the importance of humility and the dangers of hubristic behaviour. Can humility be taught and hubris prevented? The public’s thirst for celebrity status, which doesn’t spare the science world, works against this.

Is the topic of the opinion article discussed accurately in the context of the current literature?

Yes

Are all factual statements correct and adequately supported by citations?

Yes

Are arguments sufficiently supported by evidence from the published literature?

Yes

Are the conclusions drawn balanced and justified on the basis of the presented arguments?

Yes

Competing Interests: No competing interests were disclosed.

Referee Expertise: Psychiatry – mood disorders (depression bipolar disorder), psychopharmacology

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Discuss this Article

Version 1

Reader Comment 12 Feb 2018

Jan Voskuil,

This opinion paper certainly strikes a chord. This article can easily be read as a complaint toward scientists who are prone to exhibit such hubris tendencies. However, such scientist may find themselves pushed into a status of divinity without their choosing. Both Nobel laureates and oncologists can hardly resist the pressure put on them by their audience. You either resist and disappoint, or you buckle and develop the hubris as expected from you.

Therefore, I find this paper lacking a certain balance by not appreciating the pressure of expectations borne out of the status obtained by some (one-off) achievement, or based on a perceived expertise (terminal patients who are given the “choice” to extend their lives by undergoing devastating and debilitating chemotherapies as advised by their divine oncologist. "Doctor knows best"). It must be down to a feedback loop that leads to potential hubris. The scientist will first be proud of their achievement, but then is invited to speak and to write reviews that will further increase their status without necessarily adding new science. Then, as a new celebrity, the scientist starts to become a unanimous peer reviewer for a renowned publisher. Certain assumptions are becoming generally accepted facts, due to repeated statements made by the celebrity scientist and their followers, and newly submitted papers inspired by such assumptions will be accepted without further scrutiny, thus exacerbating a new-born myth. This is how the general public starts to take it as scientific facts that a fat diet causes obesity, statins prevent cardiovascular disease, amyloid plaques cause Alzheimer's disease, fossil fuel consumption causes climate change, and the universe started with a big bang. We also are led to believe that we have a thorough understanding of cancer, that we have adequate medication to depression and anxiety, and that cannabis is a greater danger to society than tobacco and alcohol.

I would love to see this opinion paper extended into more details about the pressures successful scientists endure. On the other hand, we also have to appreciate that scientists who, based on scientific arguments, try to counter a general consensus run the risk of being marginalized, ridiculed or indeed being accused of hubris.....

Competing Interests: No competing interests at all.

Reader Comment 05 Feb 2018

Amitav Banerjee, Department of Community Medicine, Dr DY Patil Medical College, Hospital and Research Centre, Pune, India

The authors have articulated a very important phenomenon. It is human to be swayed by success which can be fatal for maintaining a detached and objective approach - so essential for a scientific approach. A scientist cannot afford to fall in love with his or her ideas which leads to hubris.

Competing Interests: None

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