

## Wheat and Pepper

### Interactions Between Technology and Humans

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#### 1. Introduction

Picture a barbed wire. It is essentially a wire with spikes, which was invented by an American businessman to keep livestock enclosed. However, the influence that this seemingly minor invention had on humans and the natural environment has been enormous to say the least. Many farmers in America used it because it was inexpensive and easy to install. Consequently, the enclosed animals ate up all the grass, thus leading to desertification of vast amounts of land. State power also used it to exclude, isolate, and repress certain groups of people. The barbed wire placed around the trenches of World War I made the battle all the more long and arduous [16].

Or think about the AK-47, a rifle invented in the former Soviet Union. The only significant difference between the AK-47 and other rifles was that it had a greater level of tolerance (i.e. an acceptable range of deviation of the size of each part from the standard). However, this improvement increased its reliability under harsh conditions, endurance, and ease of production. It was used not only in the former Soviet Union, but all over the world. Terrorists and criminals have also used it and it has come to be called a ‘small weapon of mass destruction’.

Could the inventors of the said objects or their early users have ever anticipated such results?

People’s opinions on artificial intelligence (AI) vary from extreme optimism (i.e. AI can address every human problem, including starvation, diseases, energy, climate change, etc.) to extreme pessimism (i.e. AI will dominate or exterminate all humanity). However, as for long-term influences at least, it would not be reasonable to bet on any one of them and disregard the rest. There is a moderately optimistic view that, given what current AI can actually do, it would be ridiculous

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\*\* This paper is an English translation of [15].

to worry about it. While I may accept the premise that the current level of existing AI is not so great, I am not convinced with the conclusion that it will not have any serious influence.

Society is complex. Introducing a great number and variety of autonomous AI devices into it may be like introducing unknown species into an ecosystem. It would be very difficult to predict its long-term effects. Therefore, every conceivable possibility must be considered in order to be prepared to promptly and adaptively deal with any unexpected results.

Although I may have previously used the ecosystem as a metaphor, its truth goes beyond being metaphoric. Humans and technology literally have a symbiotic relationship despite the latter playing a parasitic role at times. The prevailing belief that technology is nothing more than a tool that humans use to fulfil certain intentions or goals fails to capture this important aspect of technology.

This article examines the symbiotic and parasitic relationship between technology and humans; and considers the potential impact that AI could have on the latter in terms of social relationships, in particular.

## **2. Why Do Humans Use Tools?**

‘Why does a dog wag its tail? Because a dog is smarter than its tail. If the tail were smarter, the tail would wag the dog’. This was a joke made at the beginning of the film *Wag the Dog* directed by Barry Levinson. In light of the topic at hand, one could say ‘Why do humans use tools? Because humans are smarter than tools. If tools were smarter, the tools would use the humans’. However, this is not a joke by any means. Indeed, humans are often used by tools precisely because humans are not smart enough.

The obvious reason people use tools is to effectively accomplish certain tasks. Naive theories of technology presume a master-subject relationship between humans and technology, respectively; and the latter is reduced to a means to an end. However, the relationship between humans and technology is not that simple.

The phrase ‘symbiosis with technology’ is sometimes used and in most cases, such phrases are rhetorical expressions intended to mean ‘utilizing technology well’ or something to that effect. Nevertheless, these phrases convey deeper truths beyond being mere metaphors.

Richard Dawkins, an evolutionary biologist, believes that cultural products such as ideas, expressions, patterns of behaviour, etc. are also subject to the

processes of replication, mutation, and selection; and evolve and spread as a result. He coined the term ‘memes’, which refers to the units of cultural information that are propagated. Technological products, too, are considered as memes. Actually, individual artefacts are produced and used according to certain memes. For example, earthenware pots are produced according to the meme of ‘kneading a certain kind of clay into a certain shape and heating it with fire’. Through memes, the relationship between humans and technologies may be viewed as a complicated symbiosis where biological genes and artificial memes make use of each other in order to increase the chances of spreading themselves.<sup>1</sup>

Generally, if humans find a particular type of technology useful, its meme tends to spread; whereas if it is found useless or harmful, its meme tends to vanish. Therefore, humans and technology can be viewed as reciprocating benefits to each other. However, the relationship between humans and technology is not always friendly or mutualistic. The promotion of every individual’s well-being and the overall progress of the human race are the goals of the greatest priority. Some technological products, however, spread despite having little to no contribution—or even a negative influence—on these goals. Drugs such as heroin or LSD are typical examples of this. Although they can be beneficial, they have a strong bias towards abuse. Such technological products ‘hack’, so to speak, human physiology or psychology—take advantage of people’s vulnerability in these areas—and drive humans to depend on them. In this way, they ‘parasitise’ humans and thereby succeed in survival and reproduction.

On the other hand, some technologies employ subtler strategies than drugs, which directly take advantage of human physiology. Such examples will be discussed in the following section.

### **3. Two Parasitic Technologies**

#### ***3.1. Agriculture***

The historian Yuval Noah Harari has made some interesting remarks on agriculture. He asserts that the Agricultural Revolution did not necessarily improve the standard of living of the ancient human beings who had been making a surviving through hunting and gathering. Hunter-gatherers lived on various

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<sup>1</sup> Note that, in saying so, genes and memes are anthropomorphised. Furthermore, neither genes nor memes have any intentions or goals; only ‘blind’ and mechanical processes exist.

kinds of food such as nuts, fruits, animals, and fish. Agriculture, however, prompted them to depend on fewer kinds of food, particularly grains, and this led to an imbalance in their nutrient intake. They were also at a risk of serious starvation in the event of unfavourable weather. Labour for food became more tedious and time-consuming than before. Domestication of animals also brought about a variety of infectious diseases such as malaria, smallpox, tuberculosis, measles, and influenza. All things considered, agriculture has done far more harm to human beings than good, thus making the Agricultural Revolution ‘history’s biggest fraud’ ([6], p. 79), according to Harari.

This then raises the question, why did ancient humans develop agriculture in the first place? The answer is simple. They did it because it increases the production of food per unit area. Agriculture created a large-scale society of settlers. Once such a society was built, it became increasingly difficult to return to hunting and gathering because the food required to support the population could no longer be acquired through this method. Hence, humans took on a more inconvenient life and grew crops in exchange for a larger population. Harari adds, ‘We did not domesticate wheat. It domesticated us’. ([6], p. 81). From the point of view of genes, this is acceptable. Genes are only concerned about spreading their copies, regardless of whether the individual carrying them lives a happy or miserable life. The meme of agriculture took advantage of this interest of genes. Moreover, since population further increased alongside the increase in food production, people demanded more and more food. This spurred the endless race between food production and population growth’.

Harari does not claim that the life of civilised, agricultural people rooted in agriculture is more painful than the life of ancient hunter-gatherers. He simply compares the lives of early farmers to that of the hunter-gatherers before them. For those benefiting from civilisation today, the ancient people’s decision to begin agriculture may appear to be a good one. However, as Harari points out, the famine and harsh labour that the ancient people had to go through must not be overlooked. The benefits that modern people enjoy today do not compensate for their suffering.

This could be applied to this day and age. Optimistic people would often say that although new technology may initially cause various difficulties, confusion, and pain, it will ultimately improve general human living standards in the long run. This may be true; however, it would not be logical for them to endure pain for the benefit of future humans.

### 3.2. *Military*

Another important by-product of the inception of agriculture is the emergence of the war industry. Needless to say, violence and looting also occurred between tribes of hunter-gatherers. Based on abundant archaeological, historical, and anthropological evidence, Steven Pinker concludes that the lives of ancient hunter-gatherers were much more violent than originally considered (Pinker, [11]). However, agriculture can be credited for turning warfare into an ‘industry’. For if there was no surplus of food, then plundering others would not have been a good way to get the food needed to survive. As Pinker says, it was the fear that the opponents might attack themselves as well as revenge for past violence inflicted by the other party that drove the hunter-gatherers to violence.

Social classes specialising in the exploitation of others’ labour were borne only after agriculture began and caused a food surplus. When people went beyond their communities and exploited other communities, industrialised wars ensued. The historian, William H. McNeill, characterises armed forces as ‘macroparasitism’ (McNeill [9]). From another point of view, it can be said that the meme (or a system of various memes) of military came to stand in a parasitic relationship with the meme of agriculture. Here, the term ‘military’ refers to a wide range of war-related activities such as actual combat; strategies and tactics; logistics; development and manufacture of weapons; recruitment of soldiers; and military institutions.

Early troops literally devoured the agricultural areas. Violence against the settlements of agricultural people came in the form of either raids by nomadic people or expeditions by other settled people. For example, King Akkad of Sargon, who dominated the entire Mesopotamia at around 2250 BC, advanced with his army and devastated all the agricultural zones in his path. It took several years or even decades to undo the damage they had caused (*ibid.*).

Subsequently, the relationship between agriculture and war became friendlier. This was because the systems of administration developed as well as food supply and stock accompanied by military action were effectively carried out. For example, during the Greek invasion from 480 to 479 BC, Xerxes, the then Persian king of the Achaemenid dynasty, ordered his subordinates to collect food at reservoirs set up along the course of his army. In doing so, Xerxes successfully moved a larger army than that of Sargon’s without devastating agricultural zones

along the way (*ibid.*).

War and agriculture, especially the livestock industry, gradually became even more active accomplices. When European countries competed with each other to build colonies all over the world, sheep and cattle were of great value. Wool was needed for the textile industry and cheap beef was necessary to keep workers' wages low. Therefore, countries often waged wars as a means to acquire more pastureland. On the other hand, the livestock industry directly contributed to the war effort by providing horses and salted meat etc. for military use. The sociologist, David A. Nibert, recounts the collaboration process between the war and the livestock industry during this time to promote ferocious capitalist colonial rule (Nibert [10]).<sup>2</sup>

After the two world wars, wars became obsolete as a means of expanding colonies or efficiently robbing other countries of territories and resources, in general—for most of the developed countries, at least. The law of war prohibits war based on such selfish motives. Going against international rules is too high of a risk, given the modern international political and economic structures, which mutually connect numerous countries in a complex relationship. Nevertheless, the world will never be free of wars; there will always be wars and conflicts somewhere. Countries heavily invest in their own militaries and, in turn, military technology makes remarkable progress on a daily basis.<sup>3</sup>

Just as the ancient people before the industrialisation of warfare, primitive fear and hatred continues to drive people to start wars (or prepare for them). According to recent psychological findings, human mechanisms of social cognition and emotion encourage empathy towards members belonging to the same group, as opposed to those outside the group (Bloom [1] and Greene [4]). These are most probably mechanisms that humans have developed throughout the course of evolution, when people were divided into small groups or tribes and being completely disconnected from any other tribes. During that time, such mechanisms were major factors in the survival of the said groups.

These mechanisms, however, hinder people, who realise the greater benefits of joining forces, from cooperating with people from other groups. They naturally lean towards discrimination, opposition, and conflict with different groups and

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<sup>2</sup> Nibert, as well as Harari, thinks that agriculture made humans—and other animals involved in agriculture—much more miserable.

<sup>3</sup> The Stockholm International Peace Institute estimates that 2015 global military expenditure was approximately \$1.6 trillion, which is roughly 2.2% of the world's GDP.

believe that it is ‘rational’ to alert the opponent; prepare for the latter’s betrayal and attack; and in some cases, engage in pre-emptive betrayal or attack. When a country is trapped in this mindset, the perverse logic of developing destructive weapons to overwhelm the opponent in order to maintain peace is validated. Taking advantage of such human psychology, military technology has advanced and expanded globally. It is obvious that if weapons are fully eradicated from the world, the world will be safer and more peaceful. However, it would be extremely difficult for any country to be the first to give up its weapons.

#### **4. A Security Hole in Human Psychology**

The previous section examined the histories of agricultural and military technology and saw that they did not necessarily contribute to human welfare. This chapter returns to the main subject, artificial intelligence, and explores the possibility of AI hacking humans.

There is a great variety of existing artificial intelligence with an equally wide range of technical details and applications. It would not make much sense here to discuss the self-driving car and the AI music composer at the same time. Instead, this chapter focuses on the so-called ‘social robots’, the robots and AIs that talk with humans and create ‘social relationships’ with them.

##### ***4.1. Psychological mechanisms for empathy and cooperation***

As mentioned in the previous chapter, human psychology is biased towards empathising with people who belong to the same group. However, this bias is not completely immutable and the distinction between ‘inside’ and ‘outside’ can be rather open to interpretation. For example, one can easily empathise with another if a sense of trust is formed, even upon meeting each other for the first time.

Paul J. Zak, an advocate of neuroeconomics, conducted an interesting experiment using the ‘trust game’ (Zak [14]). The trust game is as follows: The players are given a certain amount of money (\$10 in Zak’s experiment). A randomly selected player (Player A) is told to decide how much (possibly none) to invest in another randomly selected player (Player B). Player A determines the investment amount and Player B obtains three times the amount invested by the former. Player B may give some ‘returns’ (possibly none) to Player A. Player A may opt not to invest if he or she thinks that Player B will not repay, while Player

A may invest if he or she expects at least partial repayment from Player B. Therefore, Player A's investment represents the degree of trust with Player B.

Zak collected blood on the spot from the player invested on (Player B) and analysed it. Then, he found that in many cases, the oxytocin level in the extracted blood was higher than usual and that there was a correlation between the oxytocin level and the intention of repayment. Oxytocin is a hormone believed to be associated with sympathy, trust, tolerance, etc.<sup>4</sup> This experiment suggests that when an individual feels trusted by others, he or she will feel empathy for them. There are many other ways to induce empathy, Zak says. The oxytocin level can be raised through simple ways such as embracing, friendly interaction through social media, or being exposed to depictions of other's misery.

Human beings are social animals who cannot survive without cooperating with others. For individuals, finding people to cooperate with and the act of cooperating with these people are literally matters of life and death. Consequently, the philosopher Joshua Greene argues that in the course of evolution, humans have developed the ability to sensitively detect whether others are willing to cooperate or not detect whether others are willing to cooperate or not as well as the ability to act cooperatively against one's self-interest (Greene [4]).

Experiments show that such abilities already exist in young children even before they begin to speak. In an experiment, J. Kiley Hamlin and his colleagues showed a video to infants wherein certain objects made out of simple geometric shapes were behaving as if they had some intentions or purposes. Specifically, a round object behaved as if was trying to climb up a slope and a square object behaved as if it was interfering with the round one. Additionally, a triangular object behaved as if it was helping the round one climb the slope. After watching the video, the infants showed behaviour that suggested that they preferred the triangular object to the square object [5]. An experiment conducted by Yasuhiro Kanakogi et al. showed that individuals who demonstrate behaviour such as helping others under attack are preferred by pre-language children [7].

These experiments are interesting for two reasons. First, they suggest that human beings have an innate ability to identify cooperative behaviour from others and tend to positively evaluate it. Second, these experiments indicate that such ability works at a fairly abstract level. The 'individuals' that appeared in the animation used in these experiments were essentially triangles, circles, and

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<sup>4</sup> However, the actual effects of oxytocin still remain uncertain. Moreover, recent results that refute previous experiments on the effects of oxytocin have been obtained.



squares with eyes attached to them. These characters were far from human beings and did not look like any other animal either. Since humans are very sensitive to the cooperative and non-cooperative behaviour of others, they also read the behaviour of non-human objects in the same way.

However, this is a vulnerability of human psychology, a security hole that could be taken advantage of.

#### ***4.2. How social robots hack humans***

A video introducing the walking quadruped robot developed by Boston Dynamic called ‘Spot’ includes a demonstration wherein a human kicks Spot hard on the side and Spot withstands it. As it is kicked, it quickly moves its legs to maintain its balance just like a real animal would. The video ends with a disclaimer stating that ‘no robots were harmed in the making of this video’. This was probably intended as a joke, but some people did not take it as such. Some of those who saw the video felt that it was unethical to kick the robot. Noel Sharkey, a computer scientist and one of the founders of Responsible Robotics<sup>5</sup>, commented on the viewers’ reactions, saying that the ethical treatment of robots must be considered only when they should be capable of feeling pain.<sup>6</sup> However, as Sharkey points out, there is also concern that waging violence against robots that closely resemble humans or animals may diminish the sense of aversion to such violence, eventually leading to violence towards actual human beings and animals. Nevertheless, apart from such concerns, if someone is asked whether anything ethically bad was done to the robot, the answer would probably be no. If a watchmaker’s employee tramples on a new product to demonstrate its sturdiness, only a few people, if any, would be worried that something unethical was taking place. The different reactions simply result from the fact that the appearance and movement of the robot are similar to living animals, whereas those of watch are not, and this cannot be a significant ethical concern.

Robots that are capable of speaking out further complicate the issue. Just as the behaviour of triangles and squares are interpreted as cooperative, aggressive, etc. and pity for Spot is felt as if it were an actual living animal, most people

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<sup>5</sup> Responsible Robotics is an NGO that focuses on ethical issues concerning robots.

<sup>6</sup> <http://edition.cnn.com/2015/02/13/tech/spotrobot-dog-google/>. Accessed on 21st May 2017. Sharkey’s idea is based on the utilitarian principle that ‘whether an action is ethically good or bad is evaluated in terms of the amount of pleasure and pain the action caused’.

would feel the heart behind the words from a machine. Psychologist Sherry Turkle says that the only spoken words ever heard throughout the course of history were those from other humans and that current humans are the first humans who need to distinguish human utterances from artificial ones (Turkle [13], p. 342).

In fact, there may not be a lot of people who need to make such a distinction. Turkle reports that many people now tend to avoid real-time, face-to-face conversations and prefer to communicate through text messaging. They think that real-time conversation is riskier because it is difficult to control (i.e. one might say something hurtful, offensive, or that would reveal one's weakness or faults). It might also require too much time and additional costs for others. For them, 'conversation' with machines would be ideal in the sense that the latter do not get hurt or angry; they are not disappointed in one's weakness or faults; and they satisfy people's desire for communication; while enabling them to avoid the 'risks' of communication.

Softbank's CEO, Son Masayoshi says that it is Softbank's goal 'to spread personal robots, thereby increasing happiness and reducing sadness'.<sup>7</sup> Softbank advertises Peppers as a 'robot understanding emotions', an 'emotional robot', or a 'loving robot'. In the promotional video of a home robot called Jibo, developer Cynthia Breazeal asks, 'What if technology actually treated you like a human being? What if technology helped you feel closer to the ones you love? What if technology helped you, like a partner, rather than simply being a tool? [...] And together, we can humanise technology'.<sup>8</sup>

Social robots are most likely to flourish in the field of healthcare or nursing. The seal-like robot, 'Paro', developed by Takanori Shibata, a roboticist at The National Institute of Advanced Industrial Science and Technology (AIST) in Japan, is used in nursing care and holds the Guinness World Record as the 'World's Most Therapeutic Robot'. Fuji Software's conversation robot, 'Palro', is used for recreational activities in elderly homes. In Japan's already aged and ever-aging society, the demand for such robots will only continue to grow. In addition, these robots will also be useful in education. In Jibo's promotional video, there was a scene where it tells a story to a child. On a separate note, some people even believe that human beings will have sexual relations with robots in the future. For example, David Levy, an artificial intelligence researcher, predicts that humans will have sexual relationships with robots in 2050 and that robots could

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<sup>7</sup> <http://logmi.jp/39604>. Accessed on 14th September 2016.

<sup>8</sup> <https://www.youtube.com/watch?v=H0h20jRA5M0>. Accessed on 1st February 2019.

take the place of human sex workers (Levy [8]). Helen Driscoll, a psychologist, asserts that sexual technology changed social conventions and that sex with robots will be the norm by 2070—turning physical relationships between humans into a ‘primitive’ act.<sup>9</sup>

## 5. Pessimism and Optimism

Information and communications technology (ICT) and social media are changing the way people communicate with each other. Based on various social surveys and interviews, Turkle argues that smartphones and social media are also changing the practice and the norms of conversation. For example, she [13] mentions the ‘rule of three’ among American college students. This rule dictates that in social occasions such as dinners, ‘at least three people have to participate in the conversation and not be immersed in their own smartphones or devices. This means that if three people are actively engaging in a conversation, then one is allowed to be absorbed in one’s smartphone’. She is concerned that the current social norms allow people to retreat to their own smartphones even when they are in social situations.

According to Turkle, there are various consequences of the predominance of text-based communication via smartphones and people’s reluctance to partake in real-time, face-to-face communication. Children will lose the opportunity to learn empathy for others. It will become virtually impossible to communicate in an integral personality. Conversations will become fragmentary and long, complex conversations will be difficult. People will suffer from the ‘paradox of choice’ after being confronted with too many opportunities for communication.<sup>10</sup> In the end, the multitasking enabled by smartphones is inefficient and reduces both creativity and learning effect. She insists that everyone should admit that they are ‘vulnerable’ to ICT and must therefore be careful to not allow the excessive use of ICT to impede real-time, face-to-face communication between humans.

While there are people such as Turkle who are concerned about the negative effects of ICT development, philosopher Luciano Floridi is more optimistic about ICT and the future of humanity. He pictures a world where more information is circulated between initially informational people and ICT products coexist with

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<sup>9</sup> <http://www.mirror.co.uk/news/uk-news/sexrobots-the-norm-50-6190575>. Accessed 7th May 2016.

<sup>10</sup> People generally think that better choices can be made if there are more options, but in reality, too many options can lead to lower satisfaction with the result of the selection.

humans as new informational entities (Floridi [3]). Although ICT has various hurdles to overcome, it does not erode human-to-human communication; instead, it enriches human beings and the world. He believes that the bigger problem is the crisis in human self-recognition<sup>11</sup>, which is brought about by the emergence of informational entities that can perform information processing better than humans. However, by claiming that machines cannot become more ‘intelligent’ than humans, he is (probably strategically) building a line of defence.

Andy Clark is another optimistic philosopher. While mentioning the potential ramifications of ICT, he also claims that humans have been extending their capabilities to technological artefacts since the dawn of civilisation and this is precisely human nature (Clark [2]). For Clark, there is no reason to regard the current development of ICT as exceptional because humans will adapt to it and establish a new way of coexisting with it, just as they always have.

There is a conflict of views among the aforementioned intellectuals with respect to the value of communication. Turkle highlights that direct communication that involves a small number of participants in which one invests one’s whole personality, which is interactively and cooperatively constructed over time, ultimately leads to strong empathy. On the other hand, Floridi and Clark emphasise massive, frictionless information transmission among numerous informational entities, including both human beings and artefacts. They do not seem to think that the latter type of communication denies the former. In particular, Clark believes that it is possible for both to coexist and that ICT development will eventually enable communication that combines the merits of both. Conversely, Turkle thinks that people do not dare engage themselves in the former kind of communication if they get accustomed to the latter. This is what she regards as the ‘vulnerability’ of human beings to ICT.

ICT definitely has its disadvantages and some of them have already come to light. An increasing number of people have already fallen victim to ‘phubbing’.<sup>12</sup> There was a child who actually wished to ‘become a smartphone’.<sup>13</sup> A survey at the University of Michigan indicated that college students today are significantly

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<sup>11</sup> He calls this the ‘fourth revolution’ following Copernicus’s heliocentric theory, Darwin’s theory of evolution, and Freud’s psychoanalytic theory of personality.

<sup>12</sup> A combination of the words ‘phone’ and ‘snubbing’; refers to the act of using one’s mobile phone and leaving one’s company unattended as a result.

<sup>13</sup> An anecdote circulated in Singapore about a primary school teacher that assigned her pupils to write down their wishes and one pupil wrote that he wanted to ‘be a smartphone because Papa and Mama are watching smartphones all the time’.

less empathetic to others compared to those 20 to 30 years ago.<sup>14</sup> A researcher in this survey suggested that social media's easy friendship might be a factor in this, although further investigation is needed to identify the actual reason. More recently, a long-term comprehensive survey of Facebook users showed that people who 'like', click on links in other users' posts, or frequently update their profiles become less happy and their self-evaluation of mental and physical health declines. On the contrary, actual socialising has been shown to have a positive effect on the said variables. (Shakya [12]).

There will undoubtedly be some movements against ICT's development and use due to its adverse effects; however, its development and diffusion will never stop. People will increasingly use smartphones and social robots will only become more popular in the future. This is because society needs them, large companies like Google and Softbank want them to be used, and governments promote them as a growth strategy. This is a winning combination, and Floridi and Clark are probably aware of it. Given what they know, they prepare arguments for the technology, rather than objecting to the change, in order to ease the pain accompanying it. However, as social robots become more popular, more drastic changes will occur in communication and human relationships; the understanding of and expectation from them; and the customs and norms concerning them. No one can predict exactly what these changes will be like.

## **Conclusion**

When vulnerabilities are found in software, one can apply patches to address them. However, vulnerabilities or security holes in human psychology and physiology cannot always be resolved as easily. The human mind and body has adapted to the environment for millennia and, as a result, it has become what it is today. It is complex and often cannot be easily fixed. After all, one cannot hate sugar even if one intends to do so. However, it is important to be aware that the craving for sugar is not for its health benefits, but because it is an evolutionary mechanism. People must keep this in mind and harness their desire for sugar.

In order to use technology as a tool to achieve personal happiness or the prosperity of mankind, humans must be smarter than technology. Humans must understand exactly what a tool is intended for, the mechanisms in which it

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<sup>14</sup> <http://ns.umich.edu/new/releases/7724-empathycollegestudents-don-t-have-as-much-as-theyused-to>. Accessed on 16th September 2016.

operates, and how it will affect humanity, among other things. Otherwise, humans will not use tools, but tools will use humans.

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