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# Black, white or grey magic? Our future with Artificial Intelligence

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## **Black, white or grey magic? Our future with Artificial Intelligence**

‘Any sufficiently advanced technology is indistinguishable from magic.’

~ Arthur C. Clarke

Are new technologies driving us towards dystopia or utopia – or something in between? Marketers not only have a stake in finding out the answer to this question but also a direct (and indirect) influence on determining the answer. This commentary discusses recent developments in artificial intelligence (AI) and robotics, and how these are influencing marketers, consumers and society by either leading to a dystopian (black magic), utopian (white magic) or ‘dualopian’ future (grey magic). We argue that the net effect is squarely in the grey and that marketers have a unique power to leverage AI and robotics developments for good. The commentary concludes with 24 research questions forming an agenda for future research under three streams: marketing power, understanding the bias and ethics revisited.

Keywords: Artificial intelligence, robotics, cognitive bias, ethics, consumer psychology.

## **Introduction**

Marketing and technology have always been inextricably linked – sometimes we are at the forefront of developing and selling a technology; at other times, we are adapting to disruptive technologies that alter the foundations of marketing. Every time a paradigm-shifting new technology emerges, we ask the same question: is this leading us towards a utopia or a dystopia, and what role do marketers have to play in the salvation or destruction of consumers and society? Technology is again emerging that is bringing all these questions to the foreground – only this time, the technology might just be smart enough to answer the questions for us, if we let it.

Artificial intelligence (AI) and the robots that use AI are developing at an unprecedented rate; yet, despite the clear potential for fresh marketing opportunities and business models utilising these technologies (Ehret & Wirtz, 2017), we still understand little about how these technologies will influence us as marketers, consumers and as a society. Unlike the paradigm shifts of previous technologies, we cannot solely look to the innovation and adoption theories of the past for guidance (Mele, Polese, & Gummesson, 2019). The intelligent, humanised component present in AI and robotics makes these technologies uniquely complex, forcing us to confront what it means to be human. After all, when televisions were invented, nobody wondered whether they should be given autonomy or not. Yet AI and robotics will influence consumers – and the marketing industry – far more than the television now sitting complacently in our living rooms.

AI is expected to be the most influential technology for business over the next five years (Euromonitor International, 2019), with the market predicted to grow to US\$118 billion by 2025 (Tractica, 2019). This commercial growth is also mirrored in research, education and policy interest (Shoham et al., 2018). Further, with growth occurring in both public and private spaces, consumers will be experiencing AI in stores and in their homes – notably in

the form of social robots and smart home devices. From an organisational point of view, we are also preparing to embrace (or resent) the new AI and robotic colleagues who are moving from backstage manufacturing and administration to frontstage consumer service roles (Wirtz et al., 2018). Indeed, a recent review shows that service robots are already working in foodservice, retail, hospitality/travel and healthcare (Mende, Scott, van Doorn, Grewal, & Shanks, 2019).

This influx of humanised technologies presents consumers and managers alike with challenges. The very presence of these technologies invites us to question our morals (if the office robot makes a mistake, is it okay to be upset with it?), or values (would I want the comfort of a robot doing my work, or is my work tied to my sense of purpose?) and even our identity (if that thing looks and acts human, then what makes *me* a human?). Our morals, values and identities are about to come to the fore as we grapple with the decisions that we, as marketers and consumers, make (Jobin, Ienca, & Vayena, 2019).

This commentary discusses three perspectives informed by recent developments and research in AI and robotics. Specifically, we examine how these technologies are leading to a dystopia (black magic), a utopia (white magic) or a ‘dualopia’ characterised by the duality behind our choices (grey magic). This commentary aims to stimulate thought and debate on the benefit or detriment of the humanity of AI based on understanding power, bias and ethics in marketing decision-making.

### **Black magic: AI is summoning a dystopia**

‘With artificial intelligence, we are summoning the demon.’

~Elon Musk

There is much anxiety about the increasing use of AI and robotic technologies in business and society in general (Liang & Lee, 2017) – and some of these fears are not unfounded

(Berg, Buffie, & Zanna, 2018). Within the aptly named category of ‘black magic’, we differentiate between two types of ‘black’ or possibilities for harm: either solid black or unintended black. In the solid black category lie all cases of active and intentional harm, such as using robots for criminal activity, war crimes, exclusionary policies or government control. In the unintended black category resides all the harm that arises from poor execution or unintended consequences, even despite our best intentions. For instance, loss of jobs, relationship issues, reduction in human contact for the vulnerable and the unintentional exclusion of minorities and the poor. This section discusses both ‘shades of black’ and outlines relevant research that relates to each.

Within the solid black shade, active and intentional harm occurs. From the organisational perspective, as solid black changes the world, so too does it change our operating environment. In the wake of the Cambridge Analytica scandal, many organisations have discovered that the trust landscape has shifted (Isaak & Hanna, 2018). However, as technology evolves, the potential for harm increases; for instance, consider the additional damage that could be caused by a deepfake (Maras & Alexandrou, 2019) of a company CEO sharing unsavoury political ideologies via social media, or the reputational crisis associated with hacked robots and AI – the latter issue having already recently occurred when white hat hackers in the United States demonstrated that an automated Jeep could be remotely controlled (McCluskey, 2017). In the wider world, the upheaval caused by hacked AI, maliciously programmed robots and general misuse of technology to extort or control, means that marketers and consumers alike need to be aware of the potential dangers of this emerging market. From a research point of view, we can aid in turning back the black tide by examining how AI and robotics can be used to deceive and control, and how human behaviour can be used to combat these malicious intentions.

We are arguably more likely to come across ‘unintended black’ during the running of an organisation. Indeed, as marketers, we are at risk of perpetrating the unintended consequences of AI that has been poorly programmed or designed. The first area of concern has been mirrored in both practice and research; consumers experiencing vulnerability may be excluded from fully taking part in an AI future (Jobin et al., 2019). For instance, consumers experiencing poverty may be unable to afford sophisticated AI services or, conversely, may *only* be able to receive service from AI agents, as human agents become more expensive and exclusive. This last point is a particular concern when it comes to the elderly and unwell, whose true needs may not be considered (Cozza, Crevani, Hallin, & Schaeffer, 2019) or, at worst, who may be ‘abandoned’ to the sole care of robots. Consumers may also experience vulnerability or disadvantage stemming from age, education, gender identity, race and other characteristics (Borgesius, 2018). For service managers, this means co-creating with consumers to design out the disadvantage.

Consumers may also become vulnerable *because* of the AI future. There are widespread fears of job losses in the face of increasingly competent automation (McClure, 2018). Threats to privacy can also increase the vulnerability of consumers (Mani & Chouk, 2019; O’Malley, Patterson, & Evans, 1997). For instance, we currently live in a world where we are aware that robotic vacuums could be used to create maps of users’ homes (Astor, 2017), and that the lack of security around smart home systems can endanger consumers (Roby, 2019). While marketers of new technologies do not intend to create these flaws, consumer vulnerability can still result. For managers and marketers, the issue is threefold: preventing and minimising harm to employees, responding to the potential increase in vulnerable consumers, and operating in a potentially unique and certainly disruptive economy.

Finally, there are concerns that society has simply invented a new form of slavery that allows a clear conscience (Petersen, 2007; Richardson, 2016), and which is being marketed currently. The temptation for businesses is clear – with a robotic or AI workforce that does not require rest, remuneration or relief from boring or dangerous labour, exponential growth and standardised service offerings are possible. However, this too comes with its own harm, whether intended or not. Indiscriminate use of AI in this way not only leads to job losses (Berg et al., 2018) and consumer dissatisfaction (van Pinxteren, Wetzels, Rüger, Pluymaekers, & Wetzels, 2019), but brings the possibility of suffering a reputational scandal if AI rights are introduced – potentially placing the organisation on the ‘wrong side of history’.

Hence, we may be heading for a dystopia where the powerful wield AI as a form of black magic; a reality characterised by deceit, vulnerability and even slavery. Let us now examine the utopian end of the scale.

### **White magic: AI is creating a utopia**

‘The greatest benefit of the arrival of artificial intelligence is that AIs will help define humanity. We need AIs to tell us who we are.’

~ Kevin Kelly

Counterbalancing the anxiety and mistrust surrounding the growth of AI and robotics in business and society, there is optimism for what AI can give us and what it might allow us to become. This sense of AI as transformative (Cath, Wachter, Mittelstadt, Taddeo, & Floridi, 2017) fits within the category of ‘white magic’; we also differentiate two ‘shades of white’ or possibilities for good. The first is ‘angelic white’, which describes active and intentional good, created with the sole purpose of benefiting individuals and society. Into this shade fall the ideas of free healthcare staffed by AI and robots, enhanced support for the elderly and vulnerable through a lower cost to serve and increased presence, utilising AI to solve wicked



problems like disease and poverty, and even the introduction of a universal wage that will allow humans to spend their free time on creative or altruistic pursuits (Bregman, 2017). The other shade is ‘default white’, which refers to passive or unintentional good; that is, good that happens as a side-effect of other, more direct pursuits. This might include an improvement in human nature as a result of a reduction in poverty, increased health and a renewed focus on uniquely human traits like empathy and creativity. However, as with all decisions we make about our AI future, the consequences of work-related decisions could be wide-ranging, and fit into either default white or unintended black (Furman & Seamans, 2019). For example, if AI replaces humans in most jobs and a universal wage is established, the retirement industry and all the socio-cultural associations with it will disappear – this could create either positive or negative outcomes. This section discusses both ‘shades of white’ and outlines some of the relevant research that relates to each.

AI may lead us into an ‘angelic’ shade of white, where we actively use AI for the betterment of society. In a future coloured with angelic white, a comfortable universal wage and free healthcare would exist. This is the opposite of the situation occurring under unintentional black, but both are precipitated by the ‘loss’ of most jobs to robots and AI. The universal wage may sound like a fantasy, but it has already been tried in Finland, with people receiving the wage (perhaps unsurprisingly) reporting greater levels of wellbeing and happiness (Kangas, Jauhiainen, Simanainen, & Ylikännö, 2019). For marketers, such a future would still require constant vigilance; in an economy where humans do not work, the types of products and services purchased will differ along with the priorities of the new leisure class. However, maybe service managers will not be making these decisions in a utopian future – perhaps the AI will do this while we all relax on the beach. However, as we can see, even this future may come with flaws: the description provided above implies the destruction of one class system and the establishment of another. In addition, humans have a fundamental need

for meaning and purpose in their lives (Baumeister, Vohs, Aaker, & Garbinsky, 2013), so perhaps this utopia should simply provide humans with a licence to do the jobs they want to do but with reduced pressure.

AI may also be used to support healthcare. This is already happening, with studies reporting AI has been successfully used in early detection, diagnosis and outcome prediction, across fields such as cancer, cardiology and neurology (Jiang et al., 2017). AI is well-suited to identifying patterns and working with big data at speed, in a way that the human mind is incapable of doing (Topol, 2019). Hence, AI may be used to cure disease by spotting patterns and helping us adjust the behavioural missteps that can lead to medical disaster down the track. In contrast to expectations under a dystopian paradigm, AI may enable the elderly and unwell to continue to live on their own terms either through ‘ageing in place’ or ‘care in place’ (McMurray et al., 2017) or within technology-enhanced communities that create value (Čaić, Odekerken-Schröder, & Mahr, 2018).

The alternative shade of white is ‘default white’ where unintentional or indirect good may occur. For instance, if AI and robots replace human workers in some industries, we may see a return to ‘humanness’ where humans are no longer judged on efficiency and speed (traits that a machine can arguably accomplish better than we can) but on altruism, empathy and creativity. The shift in workforce composition may allow more free time and greater ease in life. Some have even noted that a reduction in working hours would lead to a decline in emissions, ultimately helping to address climate change (Bregman, 2017). Likewise, the increased use of AI in medicine may allow human researchers and doctors to work together with AI to achieve more than either group could separately, perhaps focusing on improving health and the patient experience rather than needing to focus on restoring health (Topol, 2019).

Hence, perhaps we are entering a utopia where benevolent programmers and leaders have learned to apply AI as white magic; a reality characterised by freedom, ease and health. Finally, let's move to somewhere in the middle of the scale – where black and white are competing, and the result is decidedly grey.

### **Grey magic: AI is bringing us the dualopia**

‘We’ve all got both light and dark inside us. What matters is the part we choose to act. That’s who we really are.’  
~ J.K. Rowling

Finally, there is what we suspect will be the reality – AI will be a form of grey or ‘shapeshifting’ magic, changing depending on the circumstances and influences it encounters. Perhaps tellingly, researchers have found a tendency in humans to assign roles to AI such as servant, master and friend (Schweitzer, Belk, Jordan, & Ortner, 2019), showing that AI is indeed malleable to our perceptions and intentions. As people – whether as consumers, marketers, or leaders – we can sometimes suffer from a lack of mindfulness and clarity when it comes to changes such as those that AI and robotics will undoubtedly bring. It is all too easy to suffer from myopia. This section deals with two shades of grey, each of which can be tipped towards the black or the white.

The first shade of grey is about control and priorities. AI tends to shapeshift depending on who it encounters and what their priorities are – whether or not the person is aware of the power they are wielding. Microsoft released their Tay-bot with the best of intentions, but the control passed to the public, who delighted in manipulating the machine-learning algorithm to detrimental effect (Penny, 2017; Zou & Schiebinger, 2018). This is only one example of what can go wrong when control over an AI is not well regulated, but consider what would happen if AI already had some power (e.g., functioning as a colleague in a workplace or consumer service agent in stores) and was intentionally programmed in

contrast to the interests of the organisation and consumers. As marketing managers, we have a responsibility to ensure our decisions remain ethical, and that applies to AI as well – perhaps even more so. AI could be used to control access to resources and opportunities and to influence the attitudes and behaviours of others. The question is: who is deciding, and based on which criteria (i.e., how do we decide what is ‘right’)? This question is constantly debated on the world stage as we try to decide on a code of ethics for robots, AI and their human supervisors (Cath et al., 2017; Jobin et al., 2019).

The second shade of grey is about our awareness and ability to think about the complex interrelationships between actions. As seen in ‘unintended black’ and ‘default white’, we are capable of creating a dystopia or utopia even if that is not our intention. Behavioural economics tells us that humans tend to be guided to varying degrees by certain biases that operate below our conscious awareness (Kahneman & Tversky, 2013). In the field of robotics and AI, biases that humans are influenced by include attribution bias (Haring, Watanabe, Velonaki, Tossell, & Finomore, 2018), confirmation bias (de Graaf & Allouch, 2017) and in-group bias (Kuchenbrandt, Eyssel, Bobinger, & Neufeld, 2013), among many others. This means we are likely to be blinded to the real cause of our actions, and perhaps also blinded to better options. A recent study from Harvard found that while only 19% of people will let a robot into their home when it approaches them, this number increases to 71% if a person is in a group when the robot asks for admittance and 76% if the robot comes bearing cookies (Booth et al., 2017). While not directly examined in the study, perhaps these discrepancies in behaviour could be explained by bias; for example, the person approached in the group may be experiencing a bandwagon effect, or responding to social norms and beliefs like ‘safety in numbers’. Letting a robot with cookies into the house could be explained, for example, by reciprocity bias.

So, could it be true that our reality will be characterised by a state of ‘it depends’, where nothing is necessarily black or white but rather depends on intentions, outcomes and awareness? We propose that yes, this is the colour of the future that we are currently entering and, importantly, that we, as marketers, consumers and members of society, have the power to decide.

### **Proposed research agenda for our future with AI**

‘AI is likely to be either the best or worst thing to happen to humanity.’

~Stephen Hawking

We propose that our future with AI is not something to be feared by marketing managers, but there is a need to be aware of the boundaries. We are not heading for a dystopia or a utopia; rather, we are almost certainly entering a ‘dualopia’, with a constant balancing act between black magic and white. There is a responsibility in knowing the effect of our decisions to change the world around us, from the small world of our office and organisations to our socio-political and cultural contexts. Marketers, already on constant alert for ethical and moral missteps in our work, cannot rest now. We are perhaps one of the more uniquely qualified professions to contribute to this debate, coming from a profession that is always under scrutiny and constantly cognisant of the consequences of our decisions. More pragmatically, we are the industry that will design and bring to market many of these AI and robotic products.

As marketers and as humans, every active decision we make about our AI future is a vote for black or white magic. Every passive decision is a wild card which could be cast in any direction. Hence, as we step into our future, we must all strive to avoid passivity and be mindful. We therefore propose three streams of research for illuminating our path forward: marketing power, understanding bias and equity revisited.

### ***Stream 1: Marketing power***

Power is a central theme in the debate over the design and use of AI. Power can lie in the hands of policymakers, programmers, marketers or consumers. Notably, some are excluded from power: vulnerable consumers who cannot leverage their connections, education, positions or financial assets to influence the future. Marketers are in a distinctive position, generally able to influence policy through the market economy, trained to program and design products, and arguably more connected to the needs of consumers. Hence, we can either exacerbate or ameliorate these issues, depending on if we turn to black or white magic ourselves. Two themes of enquiry are proposed for this research stream with a series of research questions within each theme.

*How can marketers determine guidelines for the design and use of AI that support the vulnerable and reduce inequality?*

Vulnerability stems from consumers who enter service exchanges with some type of disadvantage, usually personal or social characteristics that lead to discriminatory actions by service providers (Rosenbaum, Seger-Guttmann, & Giraldo, 2017). There is generally a depletion of resources (internal and/or external) that may be temporary or permanent. This vulnerability occurs when the four pillars of service inclusion are not met: enabling opportunity, offering choice, relieving suffering and fostering happiness (Fisk et al., 2018). When it comes to robotics and AI, these pillars are more important than ever. Vulnerability likely emerges from similar roots as it does currently but will be a new shade during the 4<sup>th</sup> industrial revolution. People may be disadvantaged by their lack of economic wealth (i.e., when it comes to participating in the robotics and AI market), their education (i.e., particularly their ability to program or code), their ethnic or cultural background (i.e., certain groups may find themselves over or under represented in embodied robotics, or may find that the preferences and norms of the dominant group are programmed – perhaps unthinkingly –

into all AI and robots), gender (i.e., if females are left behind in STEM education, they will be unable to effectively participate in the market), and even by their psychographic profiles (i.e., those who are resistant to change or prefer a ‘human touch’ may find their needs ignored). More than just avoiding disempowerment of vulnerable consumers, we may be able to support empowerment – but even this bears consideration, as empowerment may not mean the same thing to all people.

Thus, each of these four pillars needs to be a focus for future research, and six research question directions of are proposed for this:

- What are the requirements for enabling opportunity across different groups, depending on the resources they have available?
- How can choice be offered in a future where variations are expensive? How will the resource-availability of different consumers influence the decisions made in the AI and robotics marketplace?
- Do consumers perceive AI and robotics as a way to alleviate suffering? How might we use AI and robotics to relieve different types of suffering and is the technology better suited to certain types of suffering? Will consumers experience suffering as part of the unintended consequences of AI and robotics, and how might this be mitigated?
- Do consumers perceive AI and robotics as a way to foster happiness? How might we use AI and robotics to support different types of happiness and is the technology better suited to certain types of happiness (e.g., eudaimonic vs hedonic wellbeing)?
- In which order should the four pillars of service inclusion be constructed for AI and robotics? Is there an implied or functional hierarchy, where one pillar must be established before the others? What is the effect of an imperfect balance of pillars (i.e., one or two pillars are not met)?

- What does ‘empowerment’ mean in the 4th industrial revolution and does this meaning differ for different consumer and stakeholder groups?

*What safeguards can be designed to ensure the balance of power remains stable during the 4th industrial revolution?*

Safeguards are designed to ensure that something is protected; that is, not lost or poorly treated (Cambridge Dictionary, 2019). The balance of power is still being established for the 4<sup>th</sup> industrial revolution, but with all industrial revolutions comes the risk of one group gaining power at the expense of others. In the first industrial revolution, the shifting power balance was to the detriment of workers, who tended to be underpaid, poorly treated and forced to work long hours in dangerous environments. This situation led to the creation of the first labour unions, designed to safeguard workers from these abuses of power. In the services literature, acknowledgement of the interlinking components of the service ecosystem is important for understanding the range of exchanges and encounters that occur within and between different levels (Akaka & Vargo, 2015). A full ecosystems approach should, therefore, be applied when considering the same questions for the current industrial revolution, and all stakeholders must be considered. Consumers and employees may be the obvious choice when considering who may suffer from a change to the balance of power, but employers, community groups and even large governmental organisations could also suffer.

The unintended wellbeing consequences of these changes should also be considered; for example, just as the financial wellbeing of workers during the first industrial revolution increased, so too did other elements of wellbeing decrease, leading some to conclude that the net wellbeing effect was negative (Crafts, 1997). A holistic approach is needed that considers (i) ecosystem levels, (ii) different stakeholders and (iii) the net wellbeing effect. Thus, four research question directions are proposed:



- How are interactions within the micro level of the ecosystem influenced by the 4th industrial revolution, and what is the net wellbeing effect for all stakeholders at this level? Who has increased or decreased their wellbeing and how did this occur?
- How are interactions within the meso level of the ecosystem influenced by the 4th industrial revolution and what is the net wellbeing effect for all stakeholders at this level? Who has increased or decreased their wellbeing and how did this occur?
- How are interactions within the macro level of the ecosystem influenced by the 4th industrial revolution and what is the net wellbeing effect for all stakeholders at this level? Who has increased or decreased their wellbeing and how did this occur?
- How do robots and AI agents themselves experience power during the 4th industrial revolution?

### ***Stream 2: Understanding the bias***

Research demonstrates that human bias is at play when reacting to AI technology (Haring et al., 2018; de Graaf & Allouch, 2017; Kuchenbrandt et al., 2013). While cognitive biases can influence every aspect of human decision-making and behaviour, we are entering a time when biases have increasing importance. The reasons for this are twofold. First, our biases may lead us to inappropriate approach or avoidance behaviour (e.g., letting the cookie robot inside, or not allowing a competent robot to perform surgery when it is needed). Second, we are transmitting our biases to our AI and robotic creations in both intentional and unintentional ways. For example, the intentional hacking of Tay-bot or the unintentional biasing of the university admissions program (Penny, 2017). It is therefore important that we not only understand the human biases and subconscious decisions as reactions but also how these biases may be included in the design of AI through unintentional transmission. Two broad themes of enquiry are proposed to guide work within this research stream.

*How are AI design and use decisions influenced by the different cognitive biases of marketers, consumers and society in general?*

Behavioural biases explain the non-rational ways that human beings can sometimes think, feel and behave (Tversky & Kahneman, 1974) and help us to think faster (Kahneman, 2012). Biases also have a role to play in how we will design and use AI and robotics (Haring et al., 2018; de Graaf & Allouch, 2017; Kuchenbrandt et al., 2013). For those biases that are stimulus-oriented (e.g., anthropomorphism) there is also a likelihood that cues in the appearance or manner of the robot may lead to different biases being activated. There are a number of frameworks already emerging that classify robots and AI into types. One framework from Wirtz et al. (2018) divides robots according to task-type (tangible vs intangible action), and recipient of the service (person vs object), while also differentiating between physical (robots) and virtual (AI) service agents, in a similar way to the original Lovelock classification of services (Lovelock, 1980). Another framework from Čaić, Mahr and Oderkerken-Schröder (2019) provides a different approach to classification, focusing on the level of affective (low vs high) and cognitive (low vs high) resources deployed by the robots, resulting in categories ranging from mechanic robots (low cognitive and affective resources) to robo-sapiens (high cognitive and affective resources).

When consumers' natural propensity for bias combines with these categories, it is likely that a pseudo-class system for robots and AI might emerge. Indeed, research already indicates that greater empathy is shown towards embodied rather than disembodied robots (Kwak, Yunkyung, Eunho, Shin, & Kwangsu, 2013); hence, it is likely that the appearance or other 'cues' a robot or AI agent displays will influence the biases that are then activated, and influence our interactions with and evaluations of these technologies. Four research questions are proposed:

- Which biases will be most relevant to human–robot interactions at the micro, meso and macro levels?
- Do activated biases differ depending on the type of robot or AI agent being interacted with (i.e., mechanic vs robo-sapiens, physical vs virtual robots)?
- How will out-group bias influence societal and consumer treatment of robots and AI?
- How might status-quo bias influence (in)appropriate approach–avoid behaviour with robots/AI at all levels of the eco-system?

*How are human biases transmitted to robot/AI technology?*

Biases can be ‘passed’ from human to AI during the programming and coding process, leading to issues with racism or discrimination when the AI is dealing with people, among other issues (Penny, 2017). The transmission of bias to AI is interesting in that it mimics how ideas may be passed from a parent or a teacher to a child and, yet, unlike in human education, it is much more difficult to replace the idea – a human child is constantly growing and learning and may swap out old ideas for new ones, whereas an AI may adapt its behaviour but will generally not update its own core programming, unless of course the issue is found and dealt with by one of the increasing numbers of programmers and developers working to de-bias and design out bias from AI (Sumioka, Nakae, Kanai, & Ishiguro, 2013). If left unchecked, a bias may stay with a robot indefinitely and may be unfettered by other ideas or biases that temper its influence. In addition to these potentially unseen biases, sometimes bias is intentionally added to AI because humans like imperfect robots more (Biswas & Murray, 2017).

In a way, programming bias into an AI/robot can help it to leave the out-group behind; humans tend to embrace those who are fallible – deemed the ‘beautiful mess effect’

(Bruk, Scholl, & Bless, 2018) – allowing AI and robots to feel a little more like ‘us’. Four research questions are proposed:

- Do humans in possession of a certain bias behave the same way in a given situation as a robot/AI that is programmed to have that bias?
- What is the decay effect, if any, of human biases in an artificial system?
- Which biases are more ‘beautiful’ for AI and robots to have?
- Which biases lead to positive behaviour rather than negative?

### ***Stream 3: Ethics revisited***

Marketers are no strangers to supporting ethical behaviour (Schlegelmilch & Öberseder, 2010). Often scrutinised, marketers have spent decades dealing with complex issues and concerns with regards to marketing products, process and choices. With the dawn of the 4<sup>th</sup> industrial revolution, marketers are again called on to help create and uphold the ethical standards required to push us towards utopia. There are, however, a number of ethical concerns depending on the recipient of the harm: humans harming humans, robots harming humans and humans harming robots. Two themes of enquiry are proposed within this research stream.

*How can we uncover the (un)intended ethical dilemmas that may be created by the 4th industrial revolution?*

Of the different types of harm that the 4<sup>th</sup> industrial revolution brings, ‘humans harming humans’ is the most potent. Throughout history, innovation has not always been positive for all stakeholders, with the creation of new technologies also leading to destruction (Joly, 2019). Robots are programmed by humans, so it is the ethics of humans that should be first considered. There are three broad schools of ethics: virtue-based, consequence-based and

duty-based (Crossan, Mazutis, & Seijts, 2013). The first school is about internal principles, the second about the overall consequences of an action, and the third is about considering whether an action is *right* (Crossan et al., 2013). All three schools should be applied as a lens to help us decide where the ethical dilemmas ahead lie and result in three research questions:

- Which human virtues are necessary to ensure the ethical design and deployment of robotics and AI? Can these virtues be cultivated if necessary?
- What are the consequences of the introduction of robots and AI, at the micro, meso and macro level, for different stakeholder groups? What is the ‘net effect’ of these changes for each group?
- What different perspectives exist on what is ‘right’ when it comes to how robots and AI should function within society? How do these differ across the micro, meso and macro levels, and where do conflicts exist?

*What are the ethical standards of the 4th industrial revolution for marketers, consumers and society?*

Understanding the virtues, consequences and morality of different actions and situations will then form a natural input for a set of ethical standards, which leads to the final set of research directions for this commentary. Asimov’s laws (Asimov, 1970) illustrate some of the difficulties associated with designing ethical standards and guidelines. First proposed in science fiction, these standards and guidelines were an early call to action for ethicists and were designed only to protect humans from robots. Specifically, a robot could not directly or indirectly harm a human, a robot must always follow orders (unless doing so contradicts the first law), and a robot must maintain its own safety (unless doing so contradicts either of the first two laws; Asimov, 1970). As science-fiction movies based on these laws have since illustrated for us, these rules do not cover all possible situations and are highly open to

interpretation (Murphy & Woods, 2009).

Ethical standards are ‘morality stated as principles’ (Black’s Law Dictionary, 2019); that is, guidelines based on morals and used to inform behaviour in situations that may not be covered by the law (e.g., ethical standards tell us it is poor form to be rude to a customer service attendant, with the law only stepping in when our rudeness becomes abuse). Ethical standards are particularly important for robotics and AI because the law is still catching up with many of the moral quandaries created by these new technologies (Corrales, Fenwick, & Forgó, 2018), and they will form a backbone of guidance as developers and marketers work to bring these innovative technologies to market. Once installed, these ethical guidelines need to be adhered to and monitored, though best practice for regulation is still being decided (Corrales et al., 2018).

Ethical standards also need to be ‘fair’ according to all those affected by them. Fairness is generally understood as being comprised of three different forms of justice: distributive, procedural and interactional (Goodwin & Ross, 1992). Hence, any ethical standards should ensure that all stakeholders receive equitable access to technological resources (see also Stream 1: Marketing power), that the process for participating in the market does not unfairly disadvantage any group, and that the interaction between the different stakeholders remains balanced.

To guide us in the creation of ethical standards, we need to better understand our external influences, our ability to design and regulate our standards as an industry, and our notions of fairness. The following three research questions are proposed:

- How do narrative depictions of AI and robotics influence our formal (external) and informal (internal) ethical standards?
- Are better outcomes for consumers and society produced via self-regulation or external regulation of adherence to ethical standards?

- How do the definitions of ‘fairness’ differ between different stakeholder groups, according to distributive, procedural and interactional justice?

## Summary of future research directions

The research agenda for the three streams is summarised in Table 1.

**Table 1: Summary of the Research Agenda Proposed**

Stream	Theme	Questions
Marketing power (Stream 1)	How can marketers determine guidelines for the design and use of AI that support the vulnerable and reduce inequality?	<ol style="list-style-type: none"> <li>1. What are the requirements for enabling opportunity across different groups, depending on the resources they have available?</li> <li>2. How can choice be offered in a future where variations are expensive? How will the resource-availability of different consumers influence the decisions made in the AI and robotics marketplace?</li> <li>3. Do consumers perceive AI and robotics as a way to alleviate suffering? How might we use AI and robotics to relieve different types of suffering and is the technology better suited to certain types of suffering? Will consumers experience suffering as part of the unintended consequences of AI and robotics, and how might this be mitigated?</li> <li>4. Do consumers perceive AI and robotics as a way to foster happiness? How might we use AI and robotics to support different types of happiness and is the technology better suited to certain types of happiness (e.g., eudaimonic vs hedonic wellbeing)?</li> <li>5. In which order should the four pillars of service inclusion be constructed for AI and robotics? Is there an implied or functional hierarchy, where one pillar must be established before the others? What is the effect of an imperfect balance of pillars (i.e., one or two pillars are not met)?</li> <li>6. What does ‘empowerment’ mean in the 4th industrial revolution and does this meaning differ for different consumer and stakeholder groups?</li> </ol>
	What safeguards can be designed to ensure the balance of power remains stable during the 4th industrial revolution?	<ol style="list-style-type: none"> <li>1. How are interactions within the micro level of the ecosystem influenced by the 4th industrial revolution, and what is the net wellbeing effect for all stakeholders at this level? Who has increased or decreased their wellbeing and how did this occur?</li> <li>2. How are interactions within the meso level of the ecosystem influenced by the 4th industrial revolution and what is the net wellbeing effect for all stakeholders at this level? Who has increased or decreased their wellbeing and how did this occur?</li> <li>3. How are interactions within the macro level of the ecosystem influenced by the 4th industrial revolution and what is the net wellbeing effect for all stakeholders at this level? Who has increased or decreased their wellbeing and how did this occur?</li> <li>4. How do robots and AI agents themselves experience power during the 4th industrial revolution?</li> </ol>
Understanding the bias (Stream 2)	How are AI design and use decisions influenced by the different cognitive biases of marketers, consumers and society in general?	<ol style="list-style-type: none"> <li>1. Which biases will be most relevant to human–robot interactions at the micro, meso and macro levels?</li> <li>2. Do activated biases differ depending on the type of robot or AI agent being interacted with (i.e., mechanic vs robo-sapiens, physical vs virtual robots)?</li> <li>3. How will out-group bias influence societal and consumer treatment of robots and AI?</li> <li>4. How might status-quo bias influence (in)appropriate approach–avoid behaviour with robots/AI at all levels of the eco-system?</li> </ol>
	How are human biases transmitted to robot/AI technology?	<ol style="list-style-type: none"> <li>1. Do humans in possession of a certain bias behave the same way in a given situation as a robot/AI that is programmed to have that bias?</li> <li>2. What is the decay effect, if any, of human biases in an artificial system?</li> <li>3. Which biases are more ‘beautiful’ for AI and robots to have?</li> <li>4. Which biases lead to positive behaviour rather than negative?</li> </ol>

Stream	Theme	Questions
Ethics revisited (Stream 3)	How can we uncover the (un)intended ethical dilemmas that may be created by the 4th industrial revolution?	<ol style="list-style-type: none"> <li>1. Which human virtues are necessary to ensure the ethical design and deployment of robotics and AI? Can these virtues be cultivated if necessary?</li> <li>2. What are the consequences of the introduction of robots and AI, at the micro, meso and macro level, for different stakeholder groups? What is the 'net effect' of these changes for each group?</li> <li>3. What different perspectives exist on what is 'right' when it comes to how robots and AI should function within society? How do these differ across the micro, meso and macro levels, and where do conflicts exist?</li> </ol>
	What are the ethical standards of the 4th industrial revolution for marketers, consumers and society?	<ol style="list-style-type: none"> <li>1. How do narrative depictions of AI and robotics influence our formal (external) and informal (internal) ethical standards?</li> <li>2. Are better outcomes for consumers and society produced via self-regulation or external regulation of adherence to ethical standards?</li> <li>3. How do the definitions of 'fairness' differ between different stakeholder groups, according to distributive, procedural and interactional justice?</li> </ol>

## Conclusion

This commentary proposes that rather than being worried about what AI and robotics are going to do to us, we should instead be optimistic about what we can do for AI and robotics. Not often are we presented with magic; that is, a chance to guide the future. Now that it is in our hands, the decision is up to us: will our future with AI and robotics be black, white or shades of grey?



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